

_infill

reconfiguring public space

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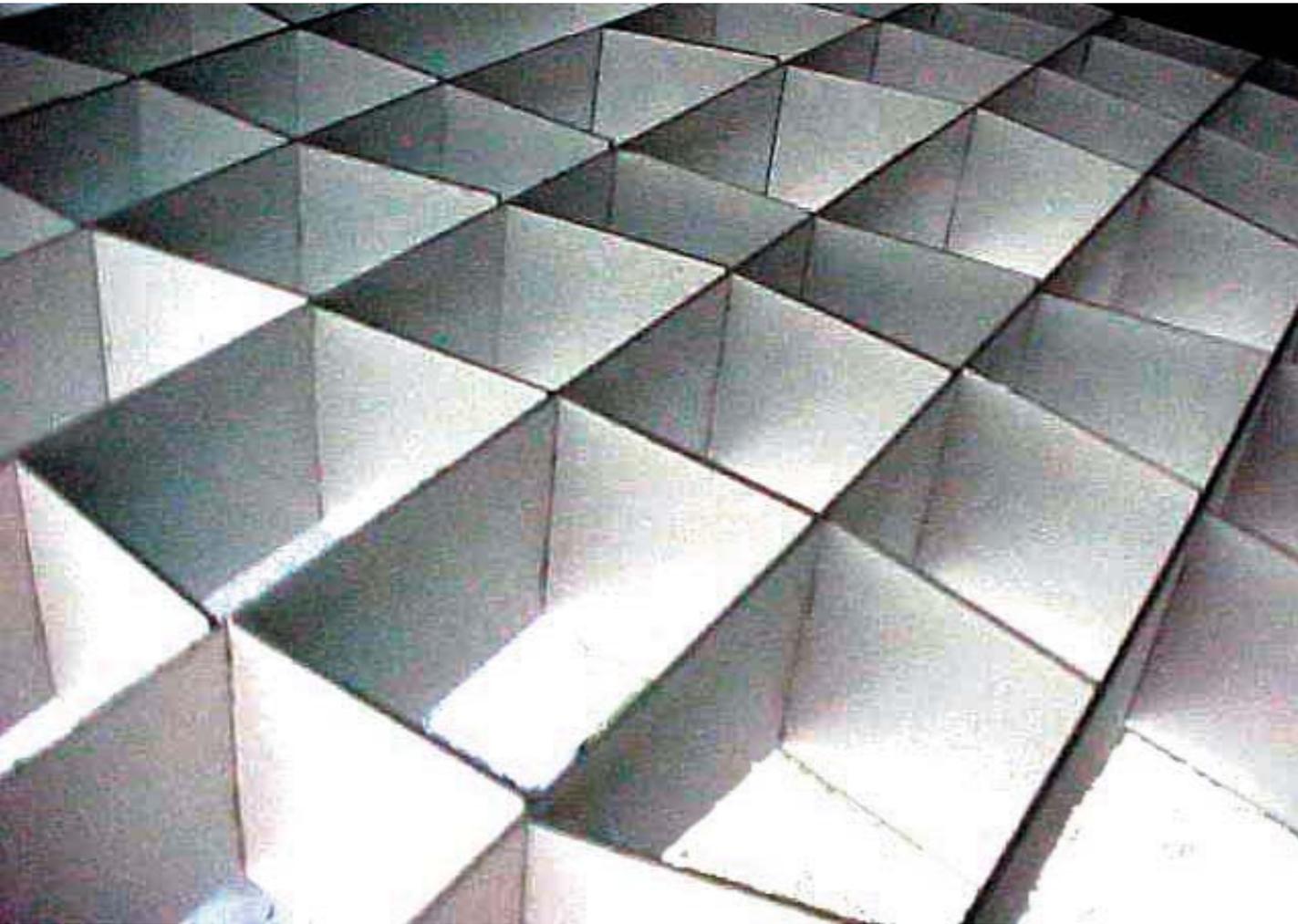


Submitted in fulfillment of part of the requirements for the degree Magister in Architecture (Professional) in the
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The study explores the infill of public presence in an urban gap on site 281/3 in Pretoria's CBD. Urban cultural diversity is used as a point of departure, to propose a public facility in the city centre to become part of a network of public spaces in the area and provide a backdrop for restorative action through the lived experience of the user.

Site investigation initially takes place on three sites, and explores the potential of each to produce an appropriate identity and programme for the intervention. Site selection reduces the intervention to one appropriate site illustrating the most opportunity for social interaction and design exploration. The proposal includes the design of a series of multi-faceted spaces, simultaneously re-using an existing building to densify the urban fabric and develop an interactive public environment.



The role of architecture is to structure our understanding of the world and of our very existence, or as Juhani Pallasmaa (2001:51) describes it: 'how the world touches us'. He addresses architecture that creates frames for action, thought and emotion, which gives expression, and structures experience. Architecture of diversity provides concepts of order and expression which exceed the present and the known, in order to initiate a dynamic resonance between the citizens of the city. Pallasmaa (2000:81) speaks of a 'fragile' architecture, that is architecture of a weak structure and image that relies on appropriateness, responsiveness and contextuality.

Building in the context of the modern city, is based on Rowe and Koetter's (1981:50) 'collage city' approach. The reappraisal of modern urbanism calls for an end to the destruction of city centre areas by new construction, and proposes an alternate strategy of 'contextualism'. The latter proposes an approach to urban renewal without the total loss of urban fabric and a return to memory and experience.

The objective is to create a middle-ground position between new and old. Depth, layering and acknowledgement of the existing is favoured over sentimentality; and memory, awareness and reaction over a *tabula rasa*. Intention is to integrate the project as part of the phenomenological city, having a fragmentary and complex quality, with a dense sum of elements that experience and time has gradually distilled.

intention

00 contents

list of figures

03 update

01 context

02 production of space

04 propose

05 detail

list of sources



page

viii

049

001

027

067

127

151

01 context

All figures by author unless otherwise specified.

00 Content figures. Fashion photographs, The British Council:Lost and found, 2000:108.

- 1.01 Aerial photograph of three sites in Pretoria city center. UP Department of Geology and The Municipality of Tshwane.
- 1.02 Street map.
- 1.03 Photomontage of pan-handle entrance in Vermeulen Street to Infill-site.
- 1.04 Photomontage of Insert-site in Schoeman Street.
- 1.05 Photomontage of Reroute-site in Church Street.
- 1.06 Figure-ground of city centre, indicating position of Infill-site in the city block.
- 1.07 Vehicular access with State Library on left hand side.
- 1.08 Off-shutter boundary wall of Old Mutual Building.
- 1.09 Existing buildings on Infill-site.
- 1.10 Vermeulen Street entrance to Infill-site.
- 1.11 Polleys Arcade.
- 1.12 Insert-site.
- 1.13 Street facade of adjacent building.
- 1.14 Insert-site seen from Schoeman Street.
- 1.15 Figure-ground of city centre, indicating position of Insert-site in the city block.
- 1.16 Figure-ground of city centre, indicating the position of Reroute-site in the city block.
- 1.17 Westerly view down Church Street.
- 1.18 Entrance to recyclable waste area.
- 1.19 Dutch Reformed Church with the Reserve Bank Building in the background.
- 1.20 Event matrix to generate programme.
- 1.21 Sketches of Infill-site.
- 1.22 Sketch of Insert-site.
- 1.23 Sketch of Reroute-site.
- 1.24 Accommodation matrix.
- 1.25 Initial concept sketch of site with spatial constraints and possibilities.
- 1.26 Shadows on summer solstice.
- 1.27 Shadows on winter solstice.
- 1.28 Shadows on equinox.

- 1.29 Position of site and Noordvaal Thoroughfare in city block.
- 1.30 Figure-ground study of city center.
- 1.31 Ground-figure study of city center.
- 1.32 Linkage of open public space in the city center.
- 1.33 Entrance to Noordvaal Thoroughfare.
- 1.34 Arcade network with indicated pedestrian movement.
- 1.35 Entrance to Polleys Arcade.
- 1.36 Entrance to Koedoe Arcade.
- 1.37 Entrance to Burlington Arcade.
- 1.38 Entrance to Sammy Marks Mall.
- 1.39 Inaccessible Strijdom Square after the dome collapsed.
- 1.40 Sammy Marks Square.
- 1.41 View of Transvaal Museum from Pretorius Square.
- 1.42 Pretorius Square.
- 1.43 Church Square.
- 1.44 Diagram of open spaces in the city center.

02 production of space

- 2.01 Background image: Image of cells defining culture difference. Enterprise IG: Image Bank.
- 2.02 Background image: Moving People. Un Studio:Move, 1999:6.
- 2.03 Image describing population and language groups eminent in South Africa.
- 2.04 Site map. studioMAS Architects: Freedom Square Precinct competition entry.
- 2.05 Computer generated image of the interior of the museum building. studioMAS Architects: Freedom Square Precinct competition entry.
- 2.06 Market elevation. studioMAS Architects: Freedom Square Precinct competition entry.
- 2.07 Diagram showing urban variety in the precinct. studioMAS Architects: Freedom Square Precinct competition entry, 2003.
- 2.08 Proposed design. studioMAS Architects: Freedom Square Precinct competition entry, 2003.
- 2.09 Competition entry model. studioMAS Architects: Freedom Square Precinct competition entry.
- 2.10 X-motif of light in the Freedom Charter Monument.
- 2.11 Detail of perspex inlay on entrance pillar.
- 2.12 Market complex.
- 2.13 Kwashisanyama (food preparation area).
- 2.14 Computer generated image looking west with the Museum on the right and the Monument on the left. studioMAS Architects: Freedom Square Precinct competition entry, 2003.
- 2.15 Computer generated image looking east towards the Freedom Charter Monument with the Museum on the right.
- 2.16 Two of the ten columns representing the ten freedoms of the Freedom Charter.
- 2.17 Multi purpose hall.
- 2.18 X-motif of seating on the square with the Freedom Charter Monument and Multi purpose hall in the background.
- 2.19 Background image: Yellow dots. Enterprise IG: Image Bank.
- 2.20 Diagram of the relation of space, time and social being.
- 2.21 Spiral. Enterprise IG: Image Bank.
- 2.23 Sun. Enterprise IG: Image Bank.
- 2.24 Building blocks. Enterprise IG: Image Bank.
- 2.25 Elevation of general well-being area. Digest of South African Architecture, 2003:58.
- 2.26 Covered walkway.
- 2.27 Forecourt.
- 2.28 Informal housing in the area.
- 2.29 Concrete frame.
- 2.30 Possible future elevation. Digest of South African Architecture, 2003:58.
- 2.31 Section through possible live-work arrangement. Digest of South African Architecture, 2003:58.
- 2.32 Site plan. Digest of South African Architecture, 2003:58.

03 update

- 3.01 Timeline of the establishment of literature and knowledge.
- 3.02 Programmatic clusters. DOMUS, June 2004:30.
- 3.03 Computer generated model of Seattle Central Library. Architectural Record, August 2000:123.
- 3.04 Grass and plant carpet in the Living Room. DOMUS, June 2004:33.
- 3.05 Dialogue between interior and exterior. DOMUS, June 2004:33.
- 3.06 Model of Seattle Central Library. The Architectural Record, August 2000:124.
- 3.07 Section through the building. DOMUS, June 2004:37.
- 3.08 Reading Room. DOMUS, June 2004:29.
- 3.09 Rubber number inlays guide the way in the Book Spiral. DOMUS, June 2004:29.
- 3.10 Idea Store in Bow. Design Indaba, April 2004:46.
- 3.11 Idea Store in Chrisp Street Market. Design Indaba, April 2004:46.
- 3.12 Timeline of successful public squares
- 3.13 Diagrammatic lighting plan. Reed, 2005:34.
- 3.14 View of hydraulic lighting masts. Reed, 2005:38.
- 3.15 View of eastern edge of Schouburgplein, lined with slatted benches. Reed, 2005:37.
- 3.16 Worm's eye view, with maple leaf inlay. Reed, 2005:37.
- 3.17 Axonometric drawing showing different layers of the project. Reed, 2005:36.
- 3.18 Aerial view of Schouburgplein. Reed, 2005:35.
- 3.19 Seating area in Paley Park. Landscape Design, May 1999:13.
- 3.20 Axonometric diagram of Paley Park. www.nycarchitecture.com/MID/MID141.htm.
- 3.21 Seating area in Greenacre Park. Simo, 1997:157.
- 3.22 Street entrance to Greenacre Park. Simo, 1997:157.
- 3.23 Section through Greenacre Park. Simo, 1997:157.
- 3.24 Concrete pergola. The Architectural Review, January 2002:86.
- 3.25 Generative sketch of park design. The Architectural Review, January 2002:84.
- 3.26 Pergola with mosaic-lined pool in background. The Architectural Review, January 2002:84.
- 3.27 Siteplan of Park. The Architectural Review, January 2002: 86.

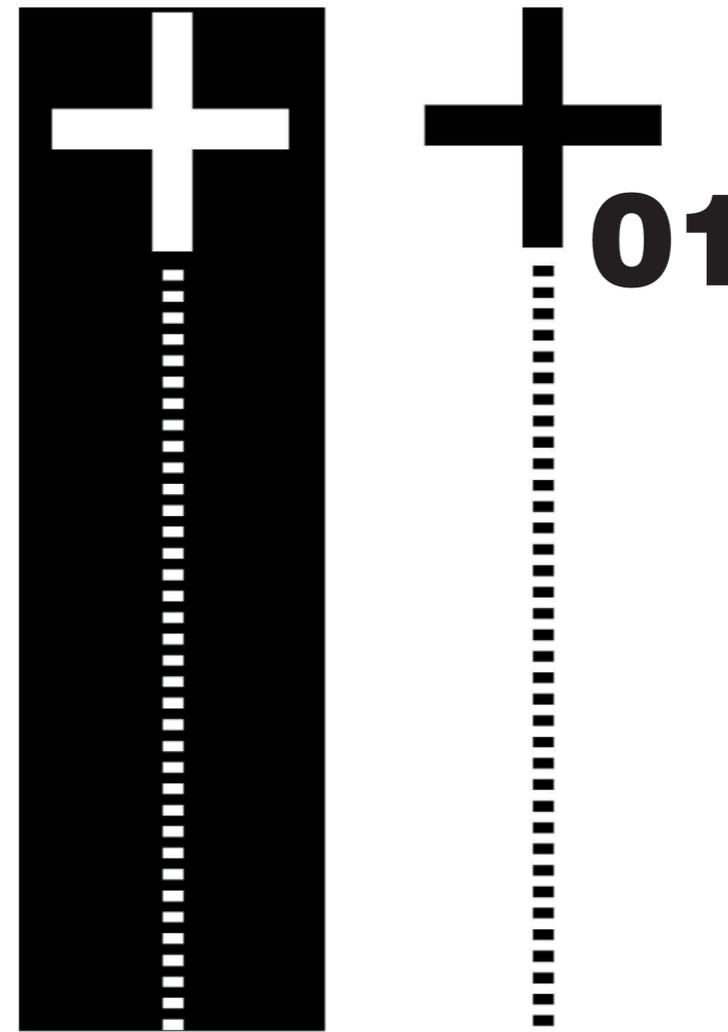
list of figures

04 propose

- 4.01- 4.06 Development of design considerations and exploration.
- 4.07- 4.09 Noordvaal Thoroughfare.
- 4.10- 4.14 Surrounding fabric.
- 4.15 Original floorplans of the National Library of South Africa.
- 4.16 Site model.
- 4.17 Intervention of ground level.
- 4.18 Intervention of first level.
- 4.19 Model of interior intervention on ground level.
- 4.20 Model of interior intervention on first level.
- 4.21 Model of programme massing
- 4.22 Entrance from arcade.
- 4.23 Public link to library.
- 4.24 View from library balcony.
- 4.25 Library courtyard.
- 4.26 Interior view of Knowledge Room.
- 4.27 View of covered walkway and public phones.
- 4.28 Concept model.
- 4.29 Concept model.
- 4.30 Concept model of Vermeulen Street entrance.
- 4.31 Vermeulen Street elevation.
- 4.32 Final model view from arcade entrance.
- 4.33 Model in urban context.
- 4.34 Model view towards courtyard.
- 4.35 - 4.38 Computer generated scenarios from final model.
- 4.39 Model view towards exterior terrace.
- 4.40 Approach to covered walkway.
- 4.41 Library courtyard.
- 4.42 Perspective view of final model.
- 4.43 Approach from Vermeulen Street.
- 4.44 Approach from Vermeulen Street.
- 4.45 Model view of Knowledge Room.
- 4.46 Interior view of Knowledge Room.
- 4.47 Interior view fo Knowledge Room.
- 4.48 Urban site plan.
- 4.49 Ground floor plan.
- 4.50 First floor plan.
- 4.51 Second floor plan.
- 4.52 Section a-a & section c-c.
- 4.53 Detail section b-b.
- 4.54 Detail section a-a.
- 4.55 Section e-e.
- 4.56 Section d-d.
- 4.57 Exploded view of staircase block.
- 4.58 Detail 001.
- 4.59 Detail 002.
- 4.60 Detail 003.
- 4.61 Detail 004.
- 4.62 Detail 005.
- 4.63 Detail 006.
- 4.64 Detail 007.

05 detail

- 5.01 Concept sketch of entrance to underground parking arcade.
- 5.02 People. UN Studio:Move, 1999:7.
- 5.03 Detail plan indicating exterior floor surfaces. Not to scale.
- 5.04 Light bulb. VISI, December 2005:157.
- 5.05 Space between things. Hertzberger, 1991:176.
- 5.06 Timber bench.
- 5.07 Baragwanath Public Transport Facility, Soweto.
- 5.08 Bench in Philippi Lansdowne.
- 5.09 Urban camouflage clothing. UN Studio: Move, 1999:289.
- 5.10 Cast concrete pavers. VISI, December 2004:82.
- 5.11 Concept model.
- 5.12 Concept sketches of lighter, tactile interior construction.
- 5.13 Concrete slab finish.
- 5.14 H-column fixing.
- 5.15 Inserted steel I-column fixing.
- 5.16 Floor finish.
- 5.17 Raised timber floor.
- 5.18 Composition.
- 5.19 Composition of steel elements.
- 5.20 Detail plan of Knowledge Room. Scale 1:200.
- 5.21 Exploded view of Knowledge Room.
- 5.22 Cast concrete tread.
- 5.23 Vermeulen Street elevation.
- 5.24 View of inserted staircase block.
- 5.25 Detail construction of composite roof.
- 5.26 Detail construction of composite roof support.
- 5.27 Exploded view of staircase block.



context

a city that works is one that is capable of responding, transforming and perfecting the way that it can support the survival of its inhabitants

Rem Koolhaas, The Lagos Charter

The modern city consists of a number of dynamic processes set in a complex urban situation. Urban spaces are in a constant flux of presence, energy and knowledge. City operations do not only occur on economical level, but also on cultural, social and political levels. Public places are key attractors for a variety of people, events, expressions and programmes, and provide the playground for society.

The purpose of this study is to investigate the production of social urban space, in order to reconceptualise architecture as a space of flows and interrelation between individuals and processes. The creation of public space, which promotes equality and appeals to the cultural diversity eminent in South Africa, is used as a point of departure to propose an urban public centre in the city centre of Pretoria. It also aims to provide a backdrop for restorative action through the lived experience of the user.



fig. 1.01. Aerial photograph of sites and surrounding area

Site investigation takes place through the identification of three relevant sites for the social production of urban space. All three are degraded urban sites in need of an intervention to restore its civic value. All three sites are tested against the proposed spatial theory of production of socially generated public space in order to generate an appropriate identity and programme for the intervention.

The proposed sites are distinct through the specific purpose and position they have in the urban fabric. These positions are defined by *infill*, *insert* and *reroute*. Although diverse in character, the three terms above may be used on all three sites, to describe related characteristics on all the sites.

While all three operations define a condition, they also suggest an action, because they exist in the form of verbs as well as nouns. All three are used as if they possessed this dual sense.

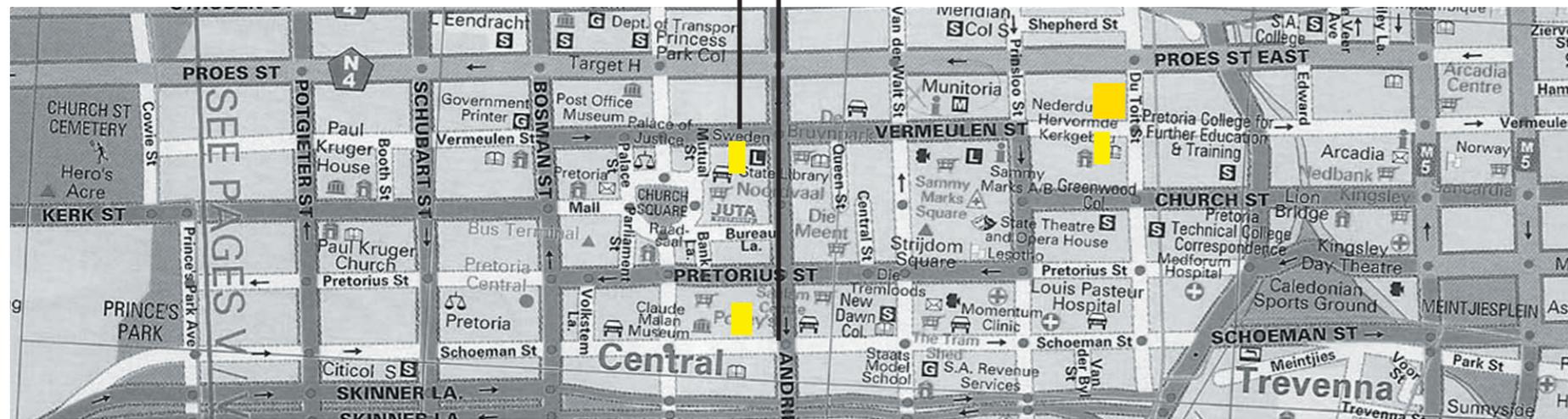


fig. 1.02. Street map with site positions indicated in yellow

infill >>

>> action as part of conception of a given boundary



fig. 1.03. Pan-handle entrance to Infill-site

insert >>

>> establish cohesion of the figure/ground formulation of the city

The following characteristics are present on all three sites, to qualify as commendable areas to propose interventions on:

- >> possess a strong public and pedestrian presence
- >> within walking distance of each other
- >> presently unutilised sites
- >> in boundary of new Pretoria area



fig.1.04. Insert-site

reroute >>
>> new approach to integration of existing public space



fig. 1.05. Reroute-site with NHG building on the corner

The site is situated in the inner-city of Pretoria, in the block directly north-east of Church Square. Heading east in Vermeulen Street, **north-east from Church Square**, one notices a slim gap in the built fabric between the Noordvaal Thoroughfare and the decorative State Library building on the corner. The three storey library building is stepped back from the street edge with no attempt to engage with pedestrian movement. The building is soon to become vacant, as a new civic Public library is being built in Struben Street. The Noordvaal Thoroughfare runs parallel to the site on its western edge, linking Church and Vermeulen Streets. There is adequate pedestrian movement around the site, but the site exists unnoticed by arcade users, because of the boundary wall.

A deteriorated single vehicular entrance does not attract adequate pedestrian attention, but carries one into the mid-block. It consists of two properties: the northern consists of the National Library of South Africa, with the southern being a pan-handle erf that functions as a service courtyard and storage facility for commercial ventures on Church Street. One is immediately aware of the scale of the tall buildings surrounding the urban gap, as if they are looking down onto it. Arrays of textures of the surrounding buildings offer the visitor a visual experience. The Old-Mutual building's basement wall forms an imposing eastern boundary for the site. It feels as if the site sits silently next to the massive off-shutter concrete wall of the building. The concrete wall neighbours the back of a red face brick building, roofed with corrugated iron. Although situated in the heart of the city centre, the visitor becomes aware of the decrease in city noise, and a feeling of seclusion.

The site has a modest quality as a result of being hidden between the surrounding buildings. Its distinct characteristics of the unpredictable, accidental and unknown space in the urban realm make it a worthy scenario to investigate. It is proposed to explore the value of an 'infill' of public presence on the site as an accidental activity. The importance of accidental public space is that it is not dependant on activity around it to sustain the impact, relevance or success thereof. A welcome and sought after pause. Receiving limited sunlight, with exposure to direct sunlight only at midday. An assortment of shadow positions are created by the adjacent buildings, covering the site in a combination of sun and shadow patterns throughout the day.



1.10

1.08

1.09

fig. 1.07. Vehicular access to site
 fig. 1.08. Boundary wall of Old Mutual Building
 fig. 1.09. Existing buildings on site
 fig. 1.10. Vermeulen Street entrance to site

infill

Enormous red capped bollards welcome one at the southern entrance of Polley's Arcade in **Schoeman Street**. Polley's Arcade slices midway through the city block to encourage movement towards the pedestrianised area of Church Square. The inviting sidewalk with marble mosaic columns support the built mass above, and the stepped back facade on ground floor level attempts to engage with pedestrian movement. Heading east in Schoeman Street, just past Polley's, the parking area on your left announces a vast break in the street facade scale and built proportion. The site announces a sudden gap in the urban fabric, with a dense population of parked cars on the erf in the otherwise cohesive facade of the rest of the city block between Paul Kruger and Andries Streets. Rude black palisade fencing isolates the site from any public activity in the street.

Once inside one's perception changes. A concrete and gravel surface leads one to an array of stepped back facades at the back which creates the illusion of added depth. The open facade in Schoeman Street is the only visual link with the site. The other three boundaries are screened off with up to nine storey buildings, limiting direct sunlight to midday. Although imposing for the visitor, the varying city skyline is still visible, and the framed view of Schoeman Street connects one to one's surroundings. Herbert Baker's prominent St Albans Cathedral resides directly opposite the parking area with the Wacthuis on the western edge, both adding to the visual quality from the site.

Insertion of a social space is proposed on this site, in order to enhance the already existing public presence in the area. The concrete surfaced space 'notices' its environment through the definite boundaries of the three adjacent buildings, but needs a gentler approach to make it a compassionate public space. Possible spatialising of a social activity, can help to generate restorative urban fibre through the experience of the users.

fig. 1.11. Polleys Arcade
 fig. 1.12. Insert-site
 fig. 1.13. Street facade of adjacent building
 fig. 1.14. Site seen from street



1.11



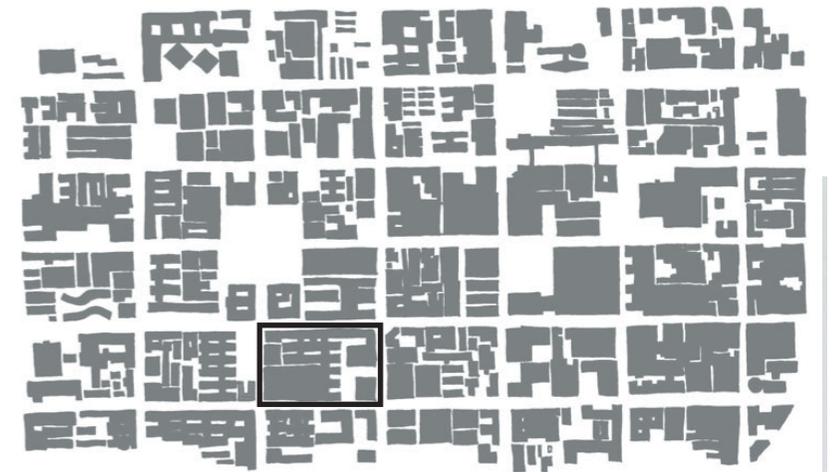
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1.14



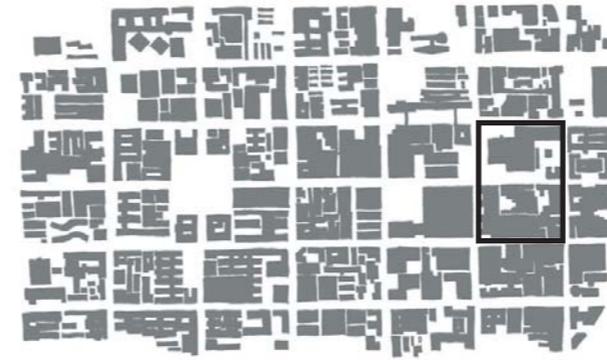
insert

The area of investigation is not pinned down to a particular erf, but **stretches over two city blocks on both sides of Church Street, between Prinsloo and Du Toit Streets.** Street characteristics of Church Street up to Du Toit Street include buildings of an average of four storeys high drawn close to the road. The imposing Reserve Bank building marks the immediate city area. The top block houses the stark granite facade of the Reserve Bank and recently built parking arcade, which enfolds the Dutch Reformed Church on the north-west. The art deco NHG apartment building inhabits the south-eastern corner, with set back open area partly used as a driving school directly west of it in Church Street.

A vehicular pan handle entrance on the opposite side of Church Street directs to a useable area which currently functions as a waste collection area. Black palisade fencing currently shuts one off from the cobbled surfaced church grounds. Trees provide adequate shaded grass areas to sit on. A mixture of textures surrounding the sacred building gives a feeling of tranquility to the site. The church and NHG apartment building shields one from the busy intersection of Church and Du Toit Streets. Interesting mirrored images of the red face brick church building reflect in the facade of the Reserve Bank. The Reserve Bank is drawn away from the street and therefore not in line with the built street edge. The space around the building is well looked after with waterfalls and greens, but dead due to the inaccessible building behind it.

Newspaper vendors and some veranda's create a pleasant variety in the spatial structure for pedestrians on both sides of the road. Crossing over the busy Church Street, an unnoticed covered entrance directs one from the sidewalk into a deteriorated open space, filled with recyclable waste material. Feeling a bit misplaced between the heaps of waste, one is still aware of the dynamics and skyline of the city around it. Although a number of apartment blocks look down upon the area, the site still receives direct sunlight for most of the day. The Pretoria Technical College in Du Toit Street guarantees sufficient pedestrian movement. A possible redirecting of movement through the open space around the church on the corner of Church and Du Toit Streets is considered, together with occupying the 'wasted' refuse space in Church Square for a more appropriate public use in the area. New excitement is produced by rethinking the route. Only action can prevent dispersion, therefore the user becomes the subject in time and space to produce and understand it.

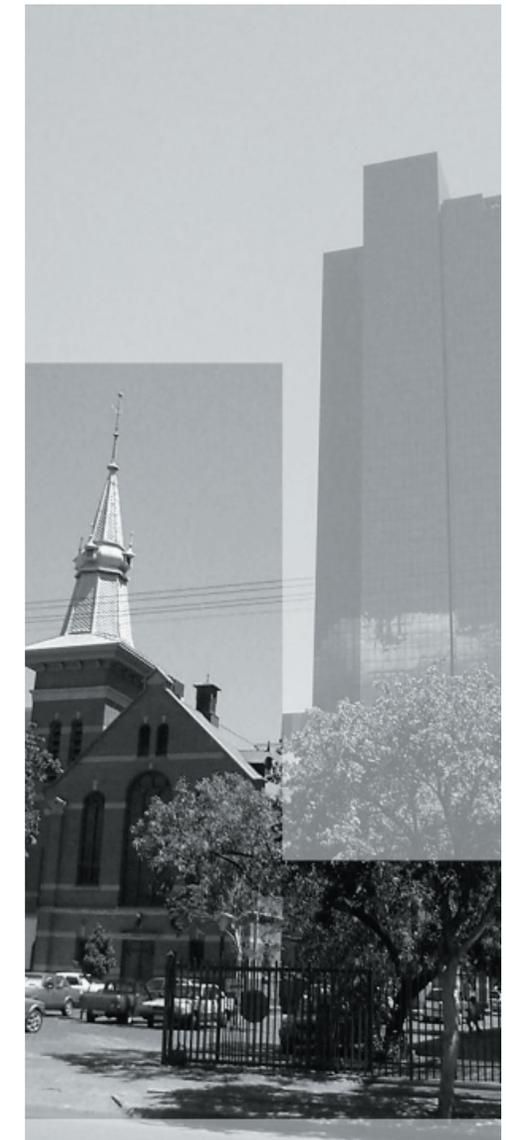
reroute



1.17



1.18



1.19

fig. 1.17. View down Church Street
fig. 1.18. Entrance to waste area
fig. 1.19. Dutch Reformed Church

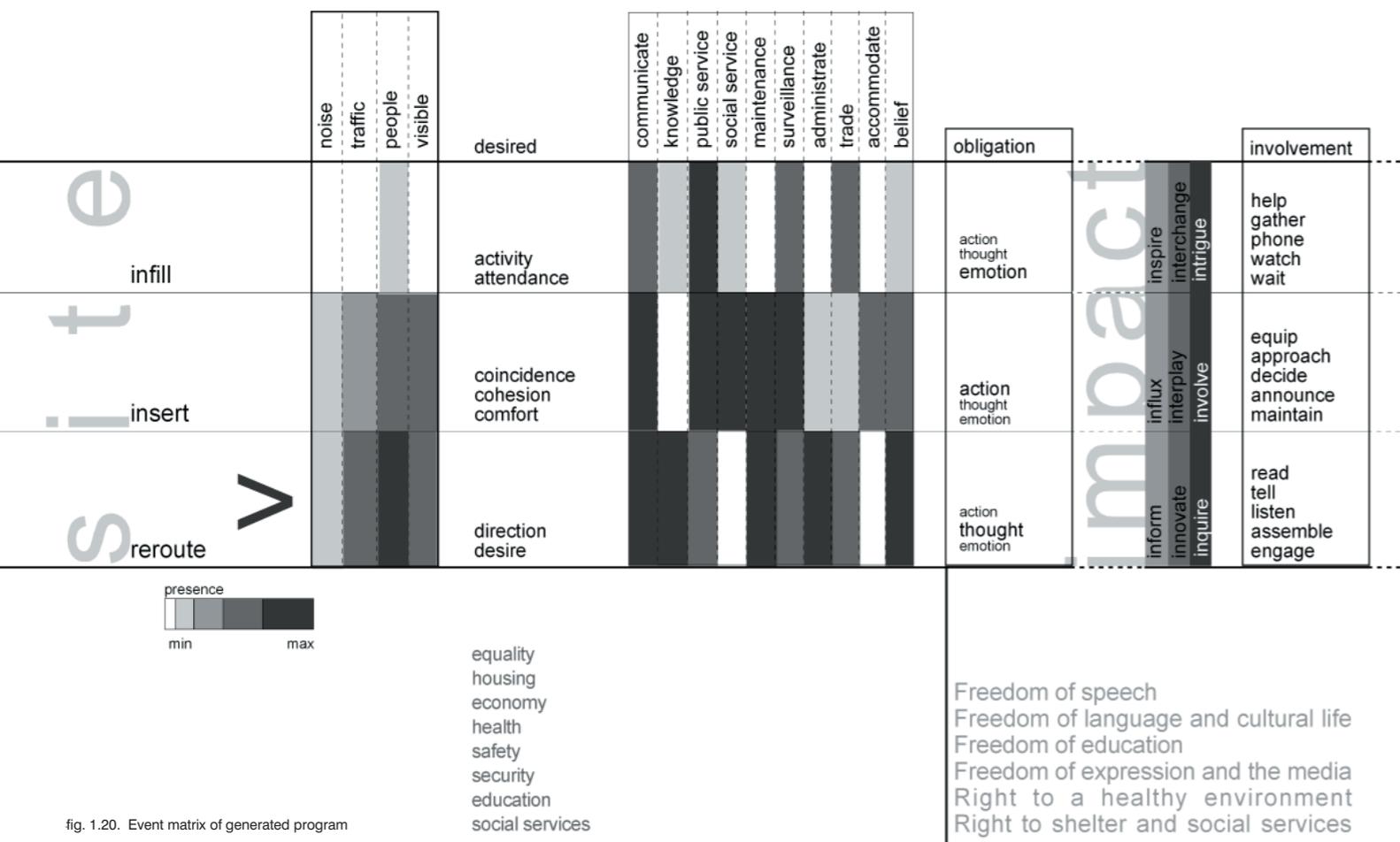


fig. 1.20. Event matrix of generated program

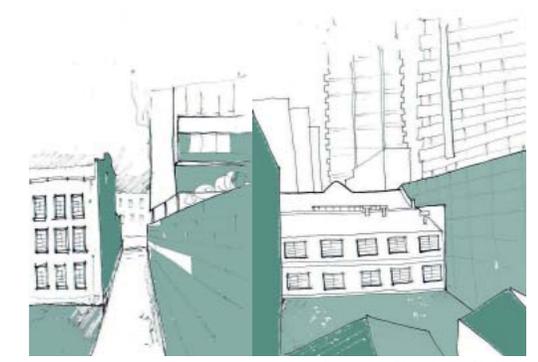


fig. 1.21. Sketches of Infill-site

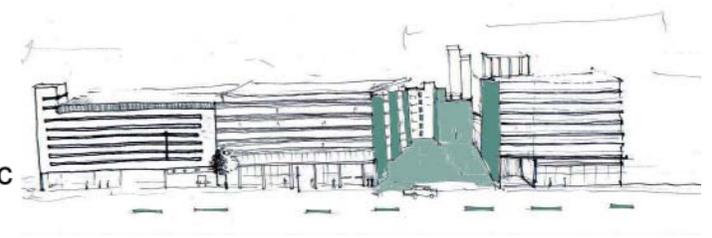


fig. 1.22. Sketch of Insert-site

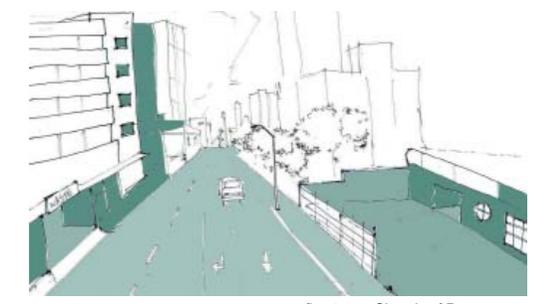
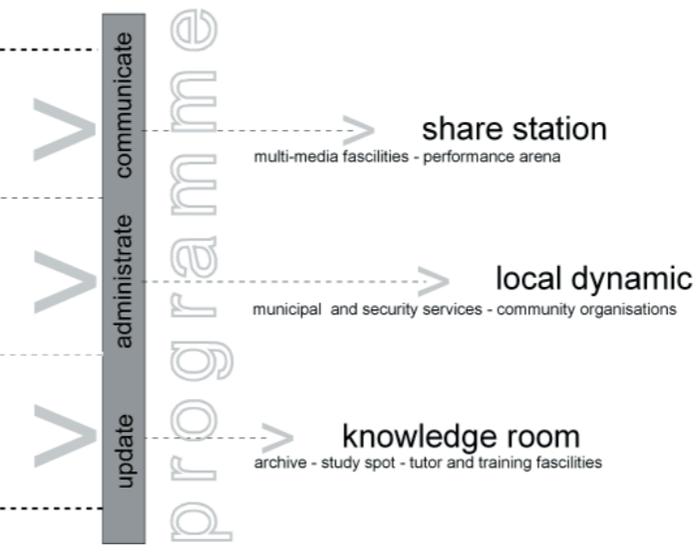


fig. 1.23. Sketch of Reroute area



SITE AS PROGRAMME GENERATOR

The characteristics present on the sites are weighed against desired activities, and obligations in the urban area which provided a list of activities related to involvement on each site. Site obligation is threefold and can be described by action, thought and emotion. Although the degree of presence varies, all three obligations are present on all the sites, which emphasises the relatedness of the three sites. Desired activities on the sites lead to a verb describing the preferred event on each site being communicate, administrate and update.

Each programme is given a new identity in order to provide a fresh, exciting and inclusive interface for familiar activities. The generated programmes act as portholes for activities and services not previously publicly accessible. They are interconnected and cross-programmatic activities are encouraged. The generated identities read as follows:

- An infill of emotion. Communicate @ the Share Station.
- An insert of action. Administrate @ your Local Dynamic.
- Reroute your thoughts. Get an update @ the Knowledge Room.

The proposal includes that the intervention should be an infill of action, emotion and thought, in order to generate a successful public realm on the currently degraded urban gap. **The desired criteria for all three sites are combined to be applied to only one specific site. Infill.**

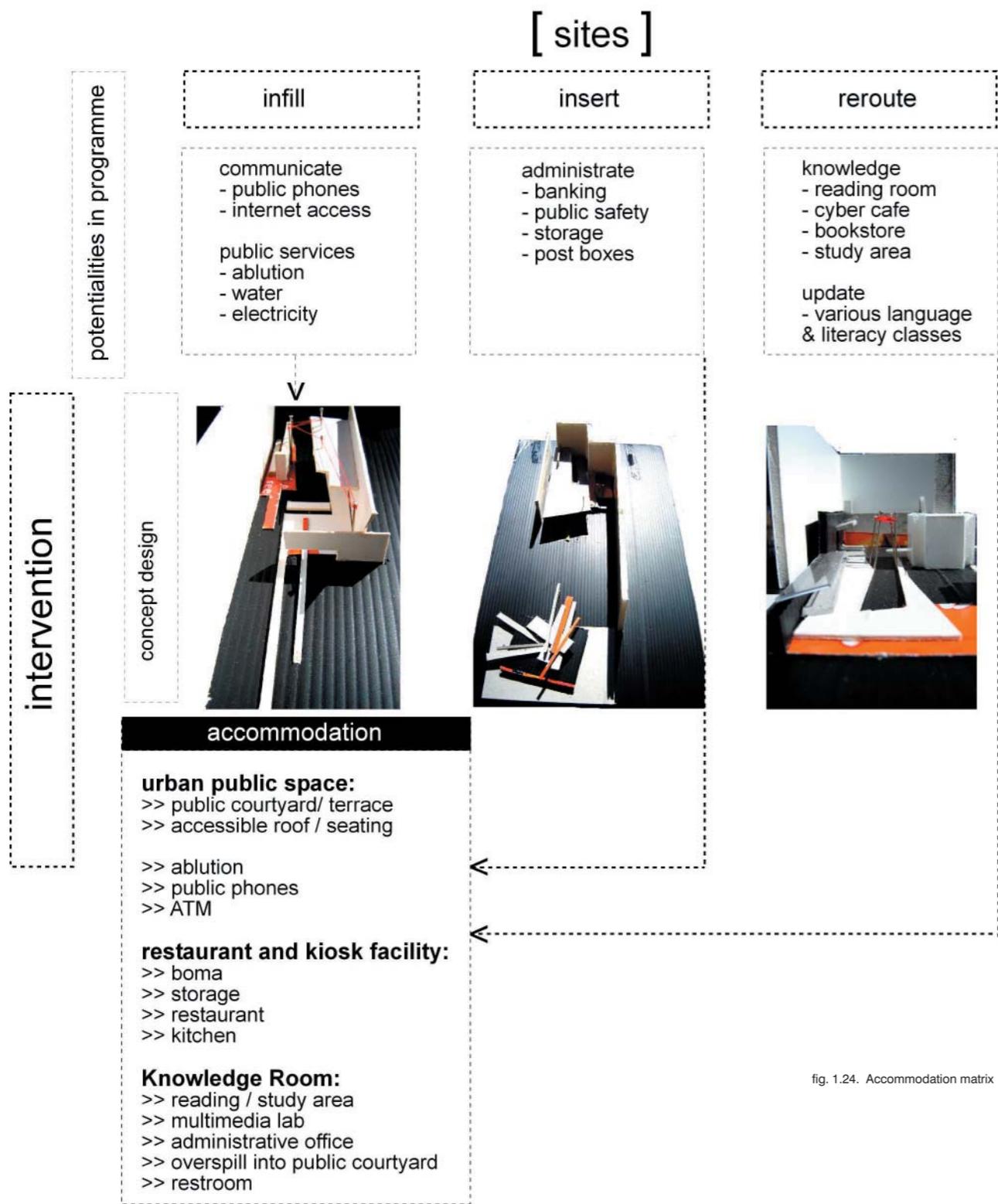


fig. 1.24. Accommodation matrix

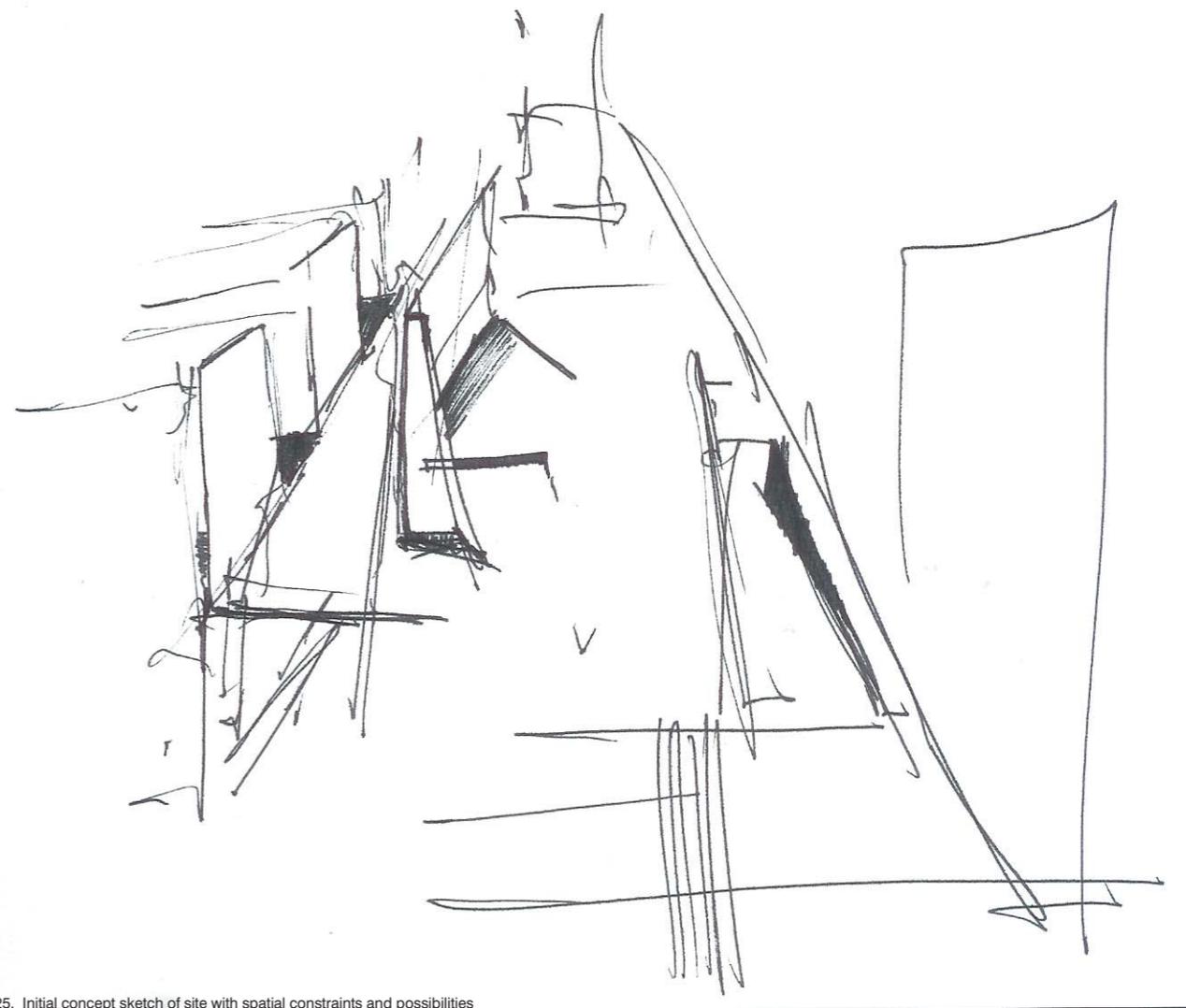


fig. 1.25. Initial concept sketch of site with spatial constraints and possibilities

The initial design concept initiated a spontaneous design response to each of the three sites. The proposed identities to each site provoke a response that relates to the desired activities and involvement on the particular sites. The interventions on each individual site appears self-centered and isolated from each other, therefore leading to a more integrated and complex intervention on only one site. The intervention joins the desired influences and attributes of the concept development on the individual sites, to manifest together on the infill site.

PROGRAMMATIC DEVELOPMENT OF INTERVENTION

Undesirable urban areas which are in need of redesign are described as lost space and antispace, where they make no positive contribution to the surroundings or users. They are ill-defined, without measurable boundaries, and fail to connect elements in a coherent way (Trancik 1986:3). The intervention proposes the regeneration of lost space by inserting a public area in the urban gap by providing basic functions, including ablution facilities, running water, communication facilities, an ATM, shaded areas, and open public areas with a food outlet. The intervention functions as a support system to the neighbouring arcade, and not as a competitor. The emphasis being on the usage of public space, and not on commercial activity. The value lies in the adding of another layer of engagement in the existing area.

The SA National Library is situated on the corner of Andries and Vermeulen Streets. The library complex consists of five buildings which form the northern edge of the proposed site. The building directly north of the site was constructed in 1918 by the Public Works Department, and became the State Library. The building is classically symmetrical and decorated with eclectic detail. The complex was not designed to accommodate a library or related functions, being one of the reasons for the relocation of the SA National Library. An opportunity exists to reinvent the urban memory of the library and for the future use to be more publicly accessible. The memory of knowledge and information embodied by the State Library is used to generate a new programme for the soon to be vacant building. The memory of the library is used to re-introduce a layer of information and learning in the city through refurbishment of the building into a Knowledge Room. The Knowledge Room will function as a support system for the new SA National Library on the corner of Struben and Andries Streets by providing additional facilities, including an online reference area, multimedia centre, cyber café, and study and reading areas. The library is to operate as a community resource, i.e. a place where you can seek information, borrow books, CD's and even DVD's.

The intervention includes both the use of the existing building of the State Library, as well as the leftover site at the back of the library, to transform both into useable urban space. The intervention in the existing building firstly proposes the building to become more publicly accessible, as the State Library was never accessible to general public. The building being more pedestrian orientated will engage with the pedestrian flow of the neighbouring arcade and Church Street Mall. Both interventions on the site are an inverse of each other. The public area is generated in the urban gap, whilst the addition to the existing building to become the Knowledge Room occurs inside the existing building. This duality is important in understanding the relatedness of the two interventions.

public places
are increasingly being seen simply
as opportunities for consumerism.
The intervention will therefore
intentionally operate through the
subconscious and conscious spatial
experience of the urban dweller,
whilst satisfying human need on a
social and cultural level. It should
also account for truly new and
challenging forms of cultural
practice and identity formation
produced within the urban context.

Pretoria has a temperate climate with an average day temperature during the summer months of 29°C, and in winter 20°C. Duration of sunshine exceeds 80% of the possible during winter and 60% of the possible during summer. Proposed design should optimise the ideal climate and direct sunlight in outdoor activities.

The position of shadows created by tall neighbouring buildings on the perimeter of the site should be taken into consideration. The desired character of outdoor areas should determine the appropriate use of cooler shaded areas, and areas exposed to the sun. Differing degrees of shelter and enclosure can accommodate a range of different kinds of urban spaces.

Pretoria in general is wind still. Occasional moderate winds blow from a north easterly direction, except during thunderstorms or weather changes, when the wind has a southerly component. The site is protected from wind exposure by neighbouring buildings. This can result in a lack of natural ventilation and should be accounted for in the design.

Average annual rainfall varies between 380mm and 700mm. Rain season occurs from November to March, reaching its peak in January. Late afternoon thunderstorms can be expected. Water elements can contribute to the sensory experience in a public area.

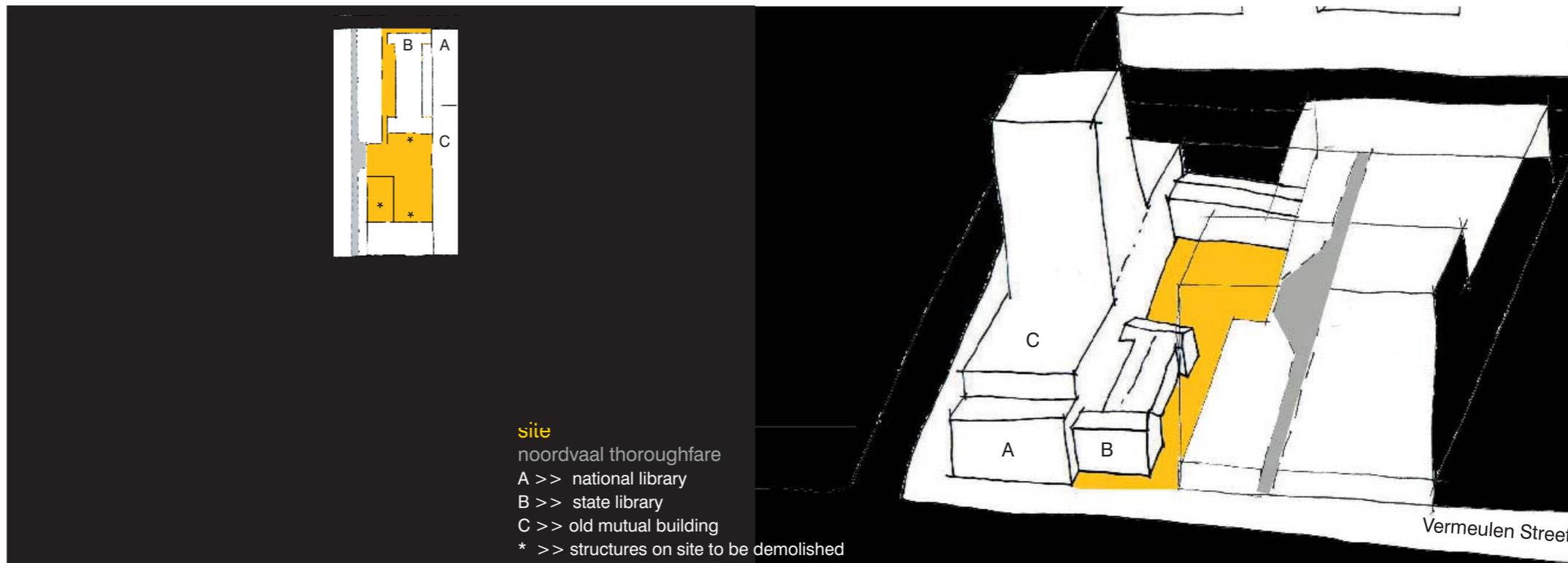
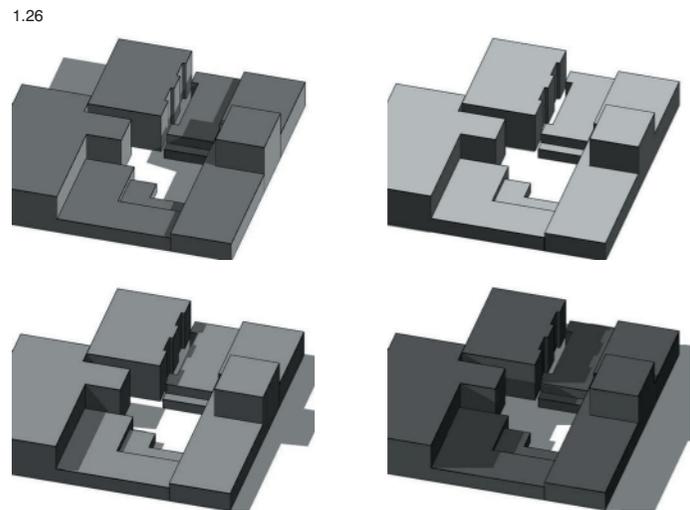
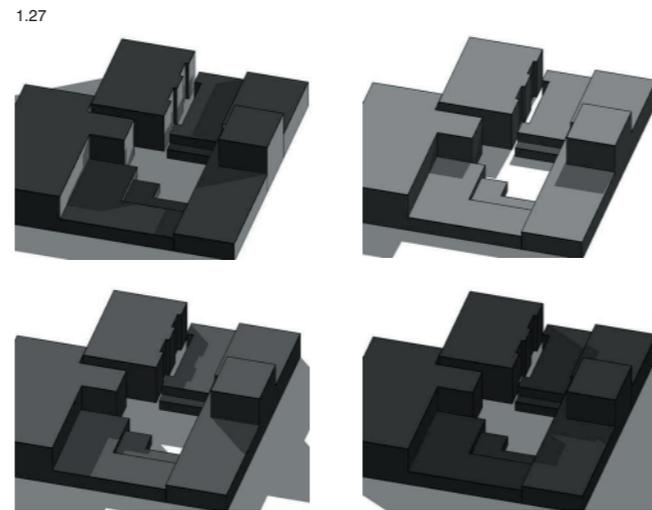


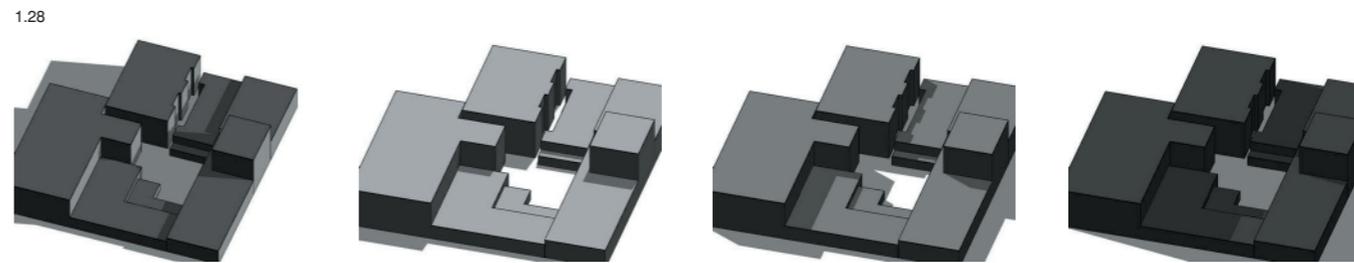
fig. 1.29. Position of Infill-site and Noordvaal Thoroughfare in city block



summer solstice
 21 december
 08:00 12:00
 15:00 17:00



winter solstice
 21 march
 08:00 12:00
 15:00 16:30



equinox
 22 march/ 22 september
 08:00 12:00 15:00 17:30

ISDF Vision:

To be the Hub of a World class City as the Capital of Africa by being a friendly and vibrant all-day-all-night People's Place catering for the social and human needs of all its people which proudly calls it Our city and Our Home (Capital Consortium, 1999).

The Integrated Spatial Development Framework (ISDF) is a document compiled by the Capitol Consortium in Pretoria. The ISDF is aimed at providing a set of guidelines for the management and understanding of the nature of the changing inner-city of Pretoria. The ISDF allows for flexibility and should rather be seen as a tool than a blueprint.

The Apartheid state brought about a massive restructuring programme of residential space within the city. This programme of extensive residential segregation and clearance of slums, manifested itself in the clearing of Marabastad and the establishment of Atteridgeville and Mamelodi. These areas were defined on the periphery of the city, which meant that not only was there a lack of opportunities but also a separation between place of work and place of residence. The poorer exploited community had to, therefore, travel long distances to opportunities, economic activities and cultural traditions. Tendencies of urban sprawl and decentralisation are still apparent in the current development of Pretoria. The decentralisation of activity from the central business district leads to the formation of edge cities (Capitol Consortium 1999:5). Activity and public presence should therefore be brought back into the city centre to revive the energy that used to be contained in the CBD.

The ISDF suggests the following:

- >> Promote urban space to be 'politically neutral'.
- >> Creation of a people's place, with vibrant human activities for 24-hours per day and 7-days per week.
- >> Planning should take place with needs of people in mind.
- >> OPEN SPACE CONCEPT_open spaces in the Inner City should be optimised to cater for human, social and recreational needs.
- >> Suggest a network of secondary open spaces routes, mostly east-west orientated, linking existing and new secondary open spaces and nodes.

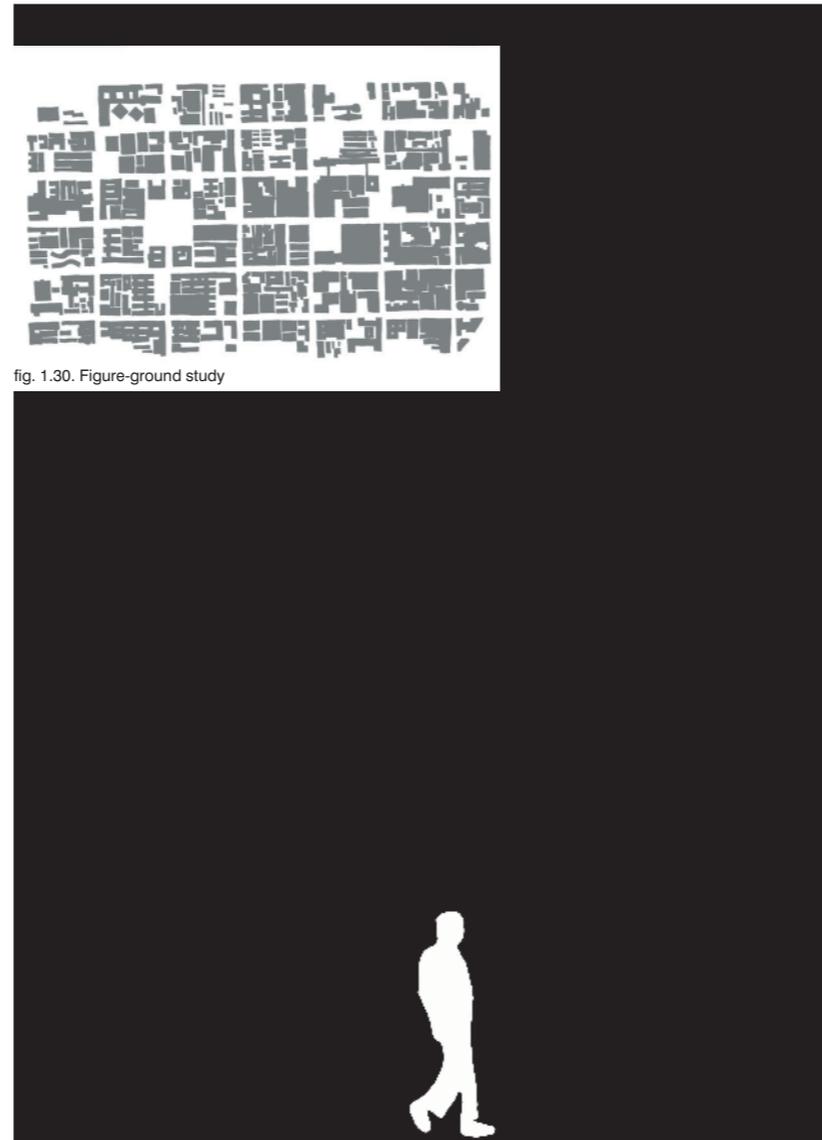


fig. 1.30. Figure-ground study



fig. 1.31. Ground-figure study



fig. 1.32. Linkage of open public spaces

The current public realm has been neglected and abandoned spaces between city buildings lack the sense of dignity associated with well-planned cities. On an urban scale, the principles to be followed are primarily those of a multi-functional approach towards streets and public spaces, robust building forms, vitality through diversity, sustainable neighbourhood structures, continuity in open space structures and environmental management.

The following principles are of specific importance for the proposed redevelopment in the area:

- >> Create a **meaningful public realm** and coherent urban open space system, in order to enhance the overall quality of the inner city's built environment, identity, its uniqueness, sense of place and capital city image.
- >> Create an awareness of the environment by designing places with an **understandable layout**. This means the ability to see and understand the significance of what is around and what is ahead.
- >> Develop places that can be used for a **variety** of uses and purposes
- >> Promote a **vibrant** and **lively** city by providing facilities for a wide variety of possible users and uses.
- >> Develop **nodes of activity** in the open space that serve to activate the space.
- >> All interventions must be of an integrated nature. Redevelopment must place special emphasis on spatial and **pedestrian** qualities.
- >> Establish a clear civic presence in the city by developing a **civic spine**, a series of links at mid-block between significant civic spaces, arcades, squares and building atriums.
- >> Promote plurality of culture in the city. Acknowledge the cultural plurality of the city through facilitating **diverse social activities**.



1.33

fig. 1.33. Entrance to Noordvaal Thoroughfare
 fig. 1.34. Arcade network with indicated pedestrian movement
 fig. 1.35. Entrance to Polleys Arcade
 fig. 1.36. Entrance to Koedoe Arcade
 fig. 1.37. Entrance to Burlington Arcade



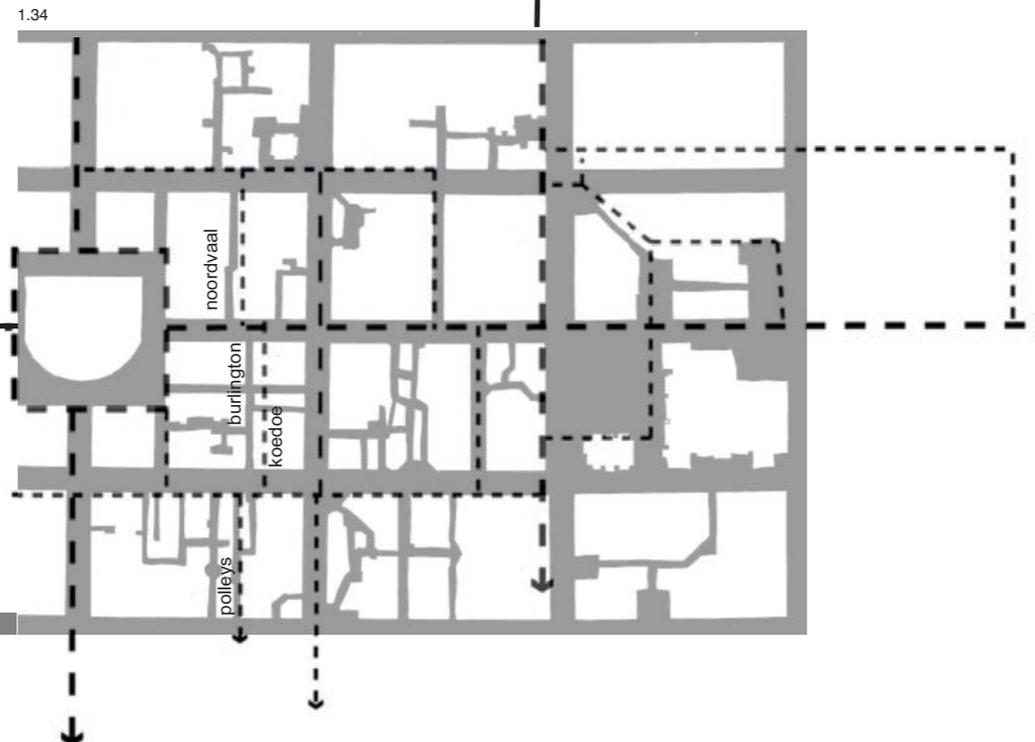
1.35



1.36



1.37



Street blocks in the CBD of Pretoria are almost twice as long as those in Johannesburg, measuring 225m in length and 140m in width. Longer distances have to be crossed between north-south connecting routes. A mid-block arcade network surrounding Church Square has north-south pedestrian routes increasing permeability in the Inner City. The arcades provide opportunity for commercial ventures along their busy pedestrian routes. The resulting permeability is successful in certain areas, but a lack of cohesive planning has resulted in disorientation, confusion and dead ends in many areas.

Burlington Arcade and The Noordvaal Thoroughfare operate successfully as pedestrian routes and commercial areas, as both connect to the east-west pedestrianised route of Church Street. Mid section areas that are open to the sky and the skylight in the Noordvaal Thoroughfare create a welcoming space for users. The city arcades have different levels of legibility; Koedoe and Polleys Arcade are examples where level changes and various entrances confuse pedestrians, while Burlington Arcade with a short and direct route is more pedestrian friendly (Bothma 2003:14). Burlington Arcade continues to both sides of the cityblock, with the Noordvaal Thoroughfare to the north, and Koedoe Arcade to the south.

The Noordvaal Thoroughfare is an important western neighbour to the site, as it is an established pedestrian route. Successful connection to the Thoroughfare will assure sufficient public activity in the desired area. The intervention does not intend to draw attention away from the Thoroughfare, but act as a support destination from it. Activities present in the Thoroughfare will not be used as anchor programmes in the intervention, to eliminate any competition. Commercial types present in the Thoroughfare are: a pharmacy, hair salon, bakery, medical practitioner, optometrist and psychologist, flower shop, credit facilities, african restaurant, fast food outlet and an electronic and cell phone supplier.

Space as a reflection of society formed through the social processes, politics and culture. The city ought to encourage the acknowledgement of differences in public spaces through:

- >> organisation of public space
- >> human understanding of the use of space
- >> the relationship of new interventions with older fabric of the city



1.39



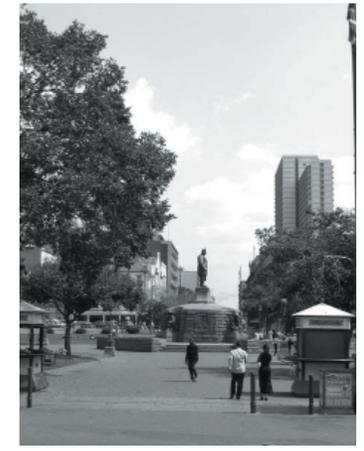
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1.41



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1.43



1.38



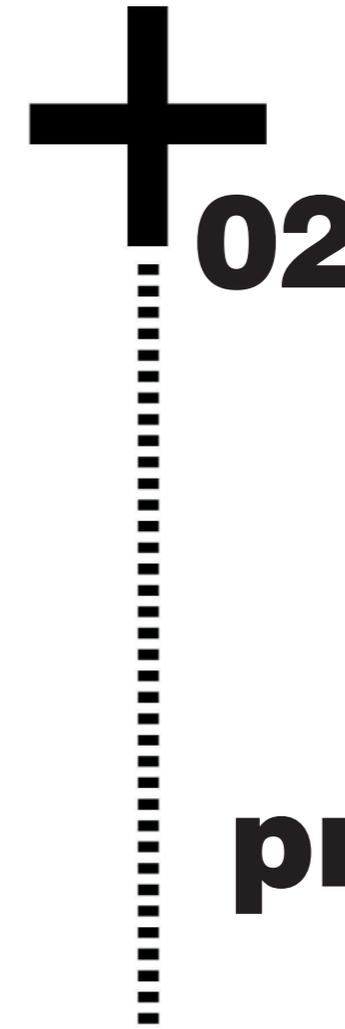
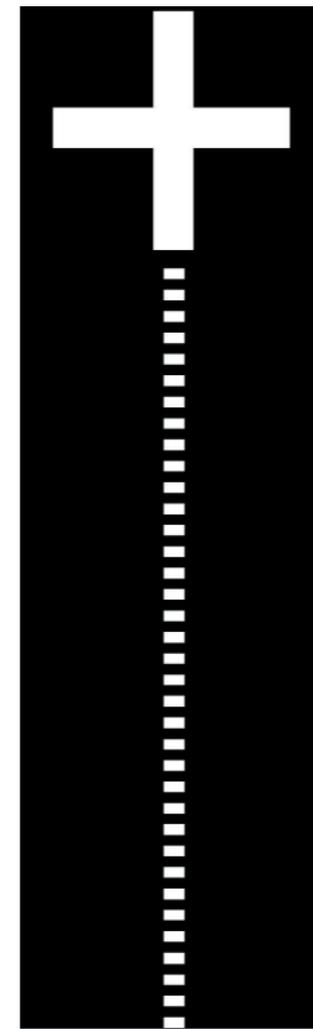
1.44

green - green space
yellow - recreational space
red - controlled public space

The Inner City contains a number of parks and open spaces, but they tend to be scattered, isolated, neglected or inaccessible. There is a need to create usable public open space. At the moment, open space tends to be mono-functional and in some instances blatantly synthetic and harsh i.e. Sammy Marks Square (Bothma 2003:14). The current array of urban open space includes recreational space for mainly sport activities, green space consisting of urban parks and public gardens, and controlled public space which describes urban squares and open institutional areas.

The problem with the squares in the inner-city is that they lack definition and character in the urban realm. Sammy Marks Square, and the rebuilt Strijdom Square do not possess any square qualities, and are only uncomfortable spaces to cross as a pedestrian. The vast impersonal concrete platforms currently present need to be softened and defined clearer, in order to enforce a square quality. Church Square and Pretorius Square can be seen as successful public places with sufficient shaded green areas between the paved paths, to ensure adequate public presence and activity on them. Both are used by city dwellers, and are popular visiting spots for tourists.

The intervention should operate as a popular urban place that meet known and unknown needs, that are flexible, that will encourage possible new forms of behaviour and new relations, a place that will promote friendliness, discourage violence and eliminate the conditions that engender fear and loathing. To succeed, an urban place needs to reconnect to people.

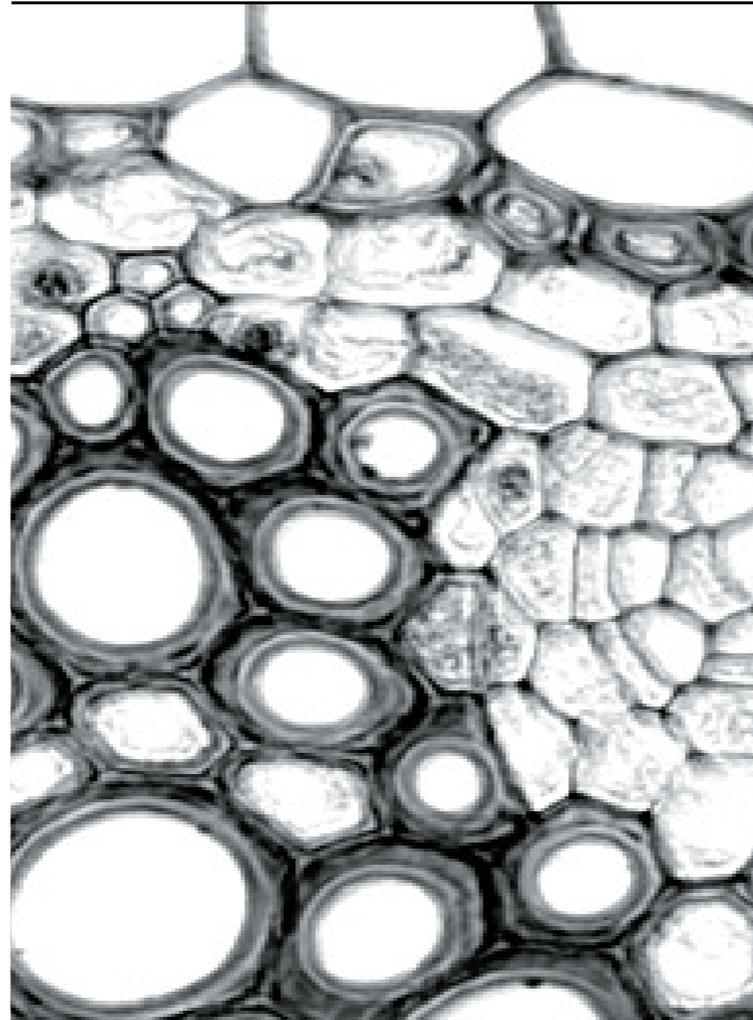


**production
of space**

DEFINING CULTURE

Clyde Kluckhohn, a prominent American cultural anthropologist, describes the concept of culture as 'a complete design for living, the total way of life of a people' and even as 'learned behaviour'. The essential or core meaning in social interaction. Culture patterns are mechanisms for the perceptions, understanding, judgement and manipulation of the world...they provide a blueprint for the organisation of social and psychological processes (Hare in Sennet 1990:130). Provocations of otherness, surprise and stimulation. The French Poet Charles Baudelaire saw the possibility for transcending cultural forces in the city. He believed that the modern city can turn people outward, not inward and rather than wholeness, the city can give them experiences of otherness. The power of the city to reorient people in this way lies in its diversity; in the presence of difference, people at least have the possibility to step outside themselves.

How to create space which can appeal to the cultural diversity eminent in South Africa? One should not aim to unify or fuse these cultures within an architectural landscape, as unity can be gained only at the price of complexity. As Sennet (1990:131-132) illustrates the essence of developing as a human being is developing the capacity for more complex experiences. The fear of differences should not lead to the production of architecture which walls off differences between people thereby making bland, neutralising space. Spaces which remove the threat of social contact. Sennet adverts the creation of weak boundaries, wherein spaces can intersect and connect, exploring the notion of cross-pollination and exchange.



Culture:
 (an)
 evolving/enabling
 reservoir
 of
 'values'
 through which one makes continuing choices
 about one's own intended self-development
 and about one's
 broader commitment to the well-being of
 nature and the well-being of others;
 metaphorically-speaking,
 (a)
 'filtering lens'
 (of relationships and resources)
 through which one perceives
 and thinks about his/her
 surrounding reality
 and his/her status
 within

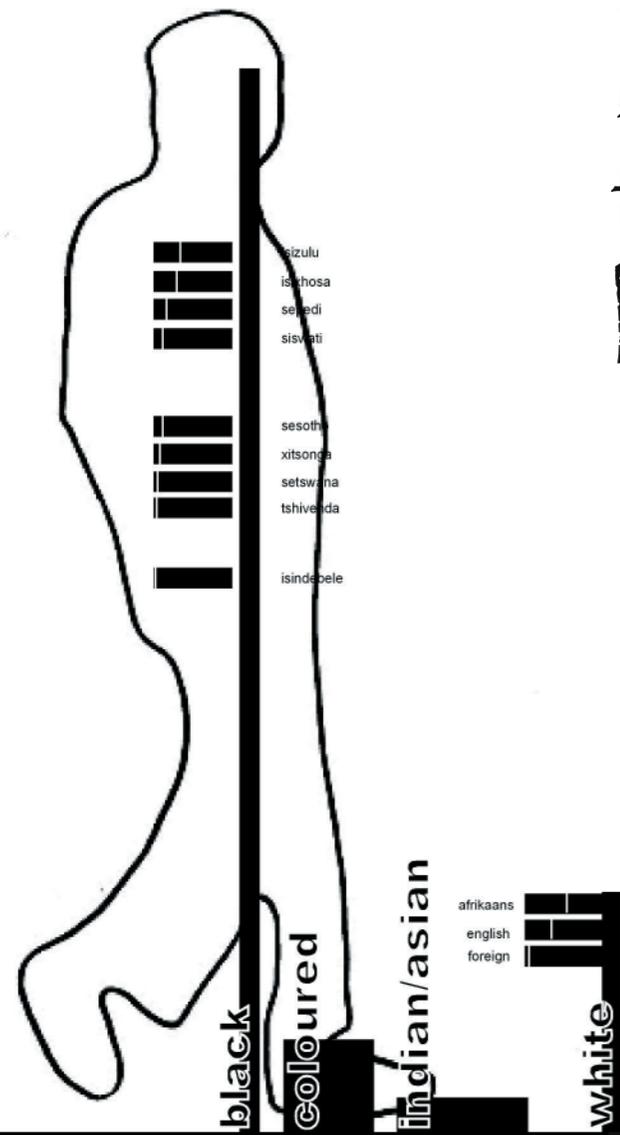
Environment:
 The boundless sum of Creation's primary energy fields-
 community/nature/spirituality/human cultural systems, etc;
 a dynamic and encompassing whole within which 'life' is
 sustained...or
 diminished (and within which each of us must, first, imagine
 and,
 then, seek to create 'places' for 21st century living)

Space:
 a human conception of environment; specifically,
 a way of perceiving and comprehending 'environment'
 such that its totality can be selectively engaged and organised
 as a resource for human activity

Chaffers 1995:49



culture 'is what counts as culture for those who participate in it'



Man only knows himself insofar as he knows the world. The world which he only comes to know in himself and himself only in it. - Goethe

(Chaffers 1995:40)

CULTURAL DIVERSITY

The problem is that culture in South Africa is extremely diverse, so which culture does one subscribe to? Even in contexts which have dominant cultural majorities there is still always a danger of creating marginalised spaces to the minority. Cultures are also always evolving and redefining, which dates the relevance thereof. Production of cultural inclusive space should align with the concept of 'events' prescribed by Tschumi and various other protagonists of the free spirit in architecture. These events are never fixed but rather offer a combination of space, action and movement which invites the user to constantly rethink and reformulate ideas of identity (Denet 2002:59).

The emphasis being on the making of environments that helps to uplift the public and to integrate South Africa's multicultural society while simultaneously celebrating, facilitating and accommodating the diverse cultures of the groups within it. The public realm should be a place where people of different cultures can interact and share in the experience of the mix and cultural differentiation that define the South African context. The cultural diversity in South Africa should be used as a tool for reviving local economies, nurturing community cultural identity, and fostering social equity.

The essence of culture is thus realised as a unique life force vested in each of us. Cultural diversity is a significant sociological characteristic of a city. City regeneration should aim to celebrate the rich culture of South Africa and include diversity of the population, as it has the potential to play a vital role in producing an inclusive, pluralistic urban society.

fig. 2.03. Population and language groups in South Africa

WALTER SISULU SQUARE OF DEDICATION
Soweto South Africa
studioMAS Architects and Urban Designers
completed 2005

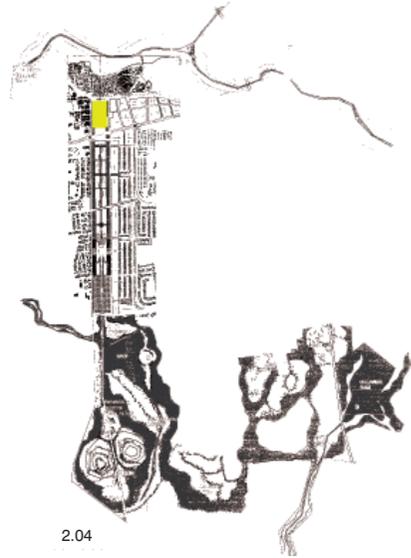
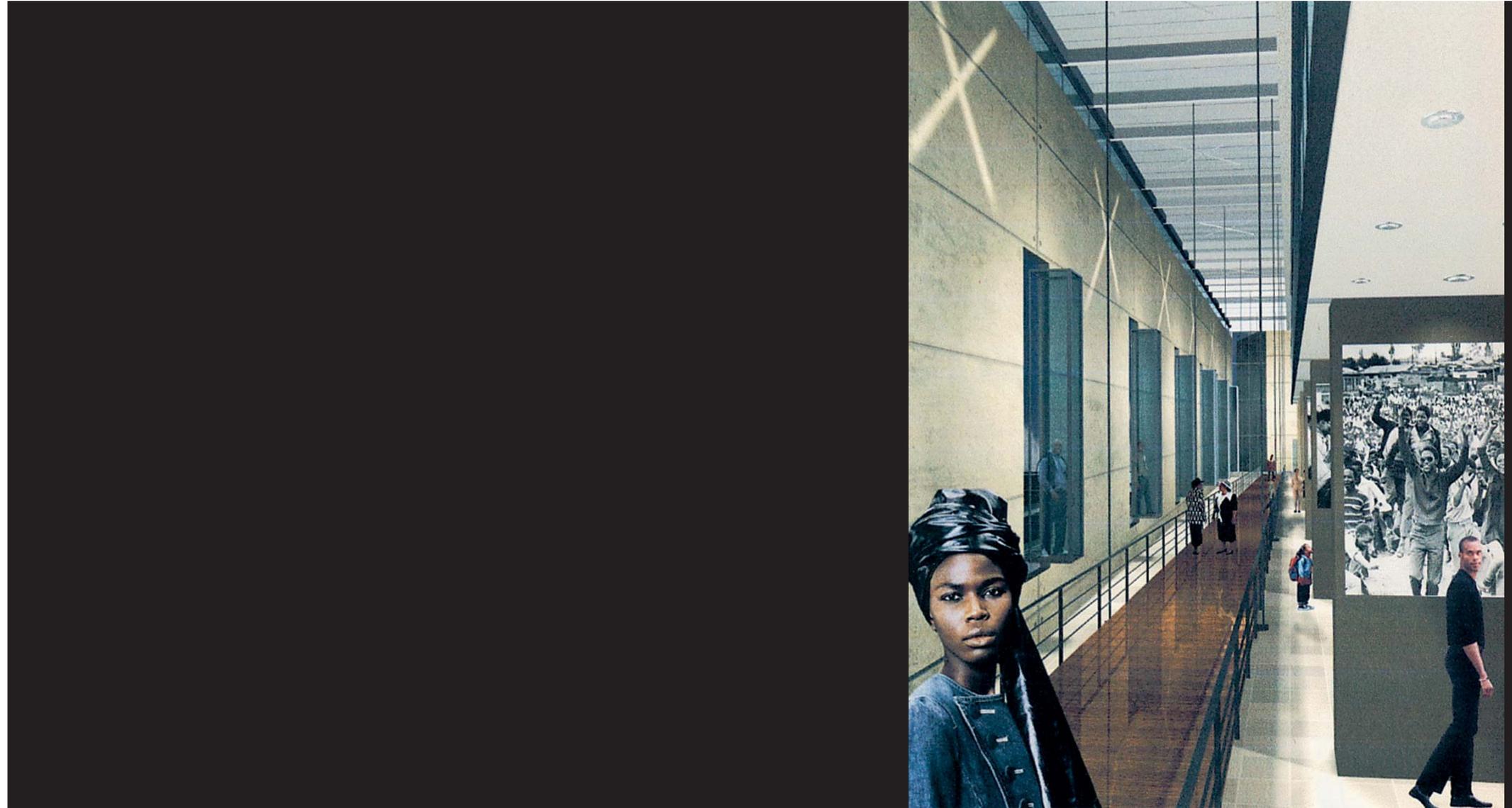


fig. 2.04. Site map
fig. 2.05. Interior of the Museum Complex



2.04

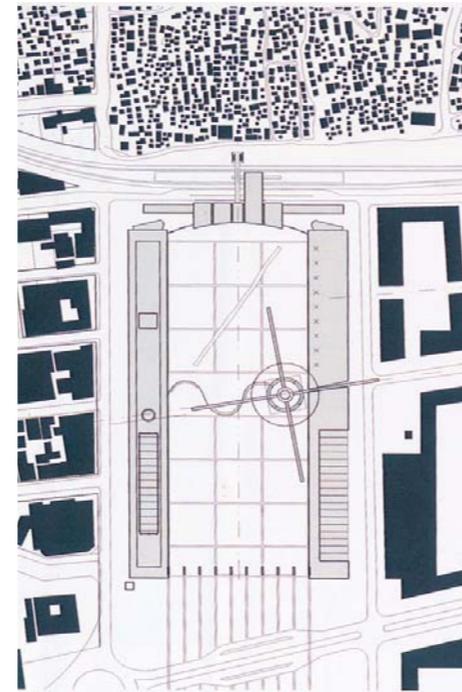
2.05

‘The fundamental principle of democracy is equality. Through equality, unity and diversity, sameness and difference, oneness and individuality are acknowledged, preserved, respected and continually balanced. This is the essence of the new South Africa as a country unified by single identity, and in which the individual identities of the manifold cultures, customs and traditions are respected and preserved. The primary aim of the design is to embody these ideas in the architecture and urban design of the Freedom Square Precinct.’

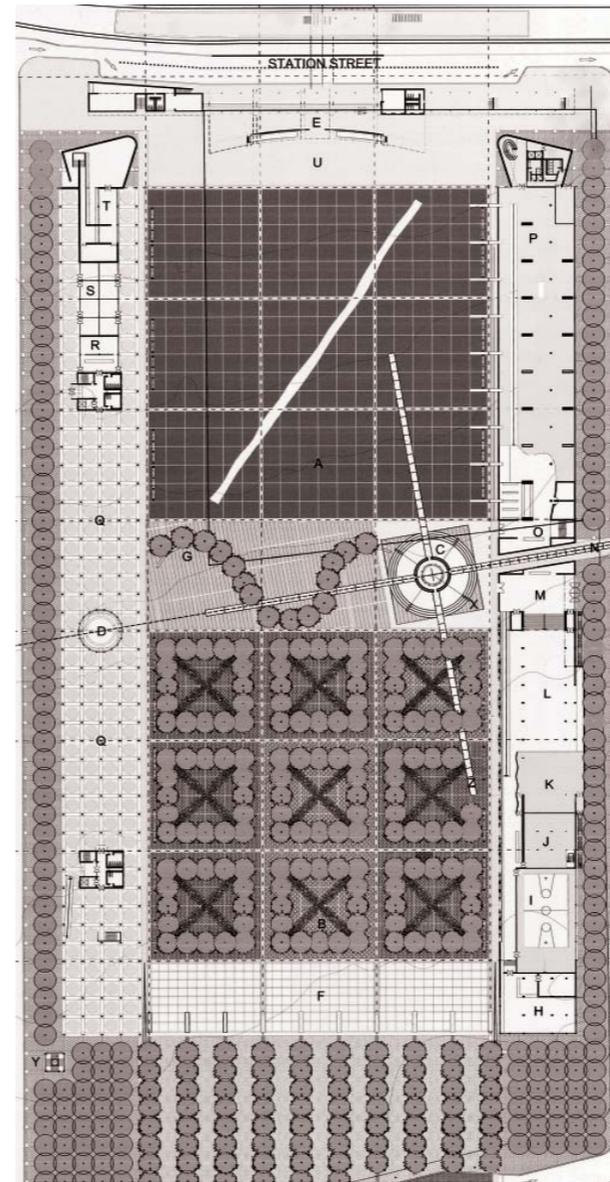
studioMAS Competition Entry, June 2002

The Kliptown Renewal project celebrates the 50th anniversary of the adoption of the Freedom Charter and centres on the heritage site of the R160 million Walter Sisulu Square of Dedication. The square symbolises not only the Charter, but also attempts to restore Kliptown’s dignity in the process, through infrastructural, environmental and economic redevelopment aimed at transforming it into a significant destination and heritage site. The project, by studioMAS Architects visually symbolises the Freedom Charter in a creative and original way.

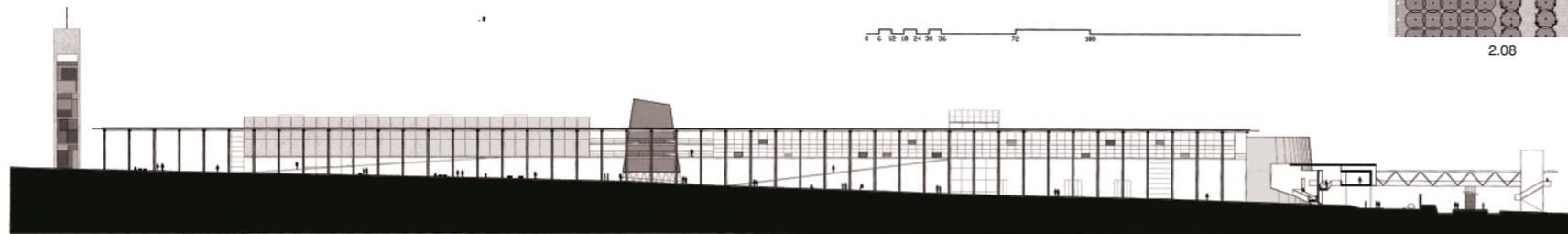
The Freedom Square is a clearly identifiable and legible public place of symbolic importance. The aim of the design is to make the square a site of local, national and international significance. On the one hand Freedom Square is intended to be a public domain in the tradition of great squares and piazzas that evokes a sense of monumentality and the symbolic heritage of the site and the Freedom Charter itself. On the other hand it is also a domain that is accessible, open and inviting, one that has facilities and which creates opportunities for the people of Soweto. The architect’s aim was not to design another museum, but rather a place which the community can use. A place where employment is generated and people encouraged to start their own businesses.



2.07



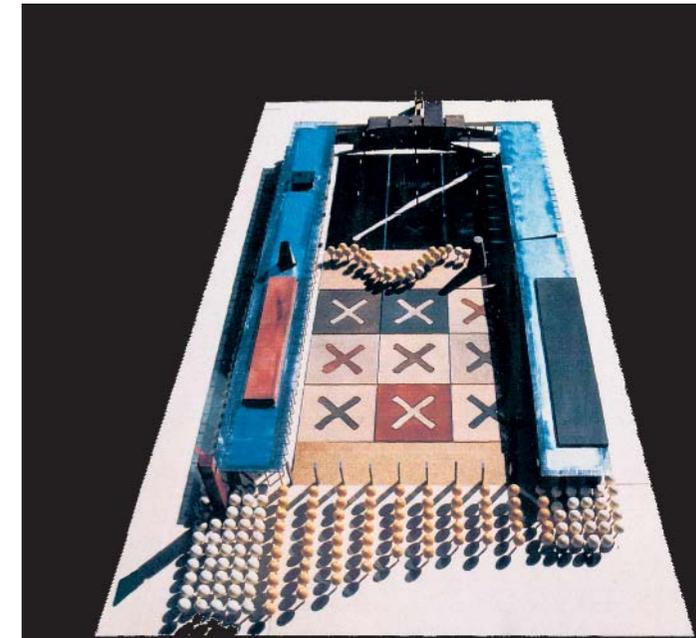
2.08



2.06

The square can be seen as an open room in the city, defined on three edges. Central guiding principles of democracy inform the various aspect of the design, from disposition and interrelationship of the buildings surrounding the square, to the access to opportunity that the square holds. Programme includes a museum complex, training facility (freedom of education), market (freedom of trade), multipurpose and performing arts centre (freedom of speech), and incorporates the existing Kliptown railway station. The buildings hold adaptability and expandability as their core principles in the design. Each building or element is interdependent on one another yet self-sustaining. As one function becomes redundant, it should never have to remain as dead space. The robust building framework allows for the ease of design interventions and the flexibility to facilitate change. The buildings are off-shutter concrete skeletons which add to their robust nature.

fig. 2.06. Market elevation
fig. 2.07. Urban variety
fig. 2.08. Plan of Freedom Square
fig. 2.09. Model



2.09

The articulation of the symbolism of the site is achieved through a number of motifs and forms. The X: as a symbolic mark of one's vote and hence freedom, the X is one of the central motifs of the scheme. It is used in various ways including the X of light in the Freedom Charter Monument, the X on the paving and seating of Freedom Square, and the X bracing in the Museum complex and Performing Arts Centre. The Paving: in the Old Square, the original site of Freedom Square, black paving with a stark white grid laid over, symbolises the harshness of the old regime. The grid symbolises not only colonial architecture and city planning but also prison bars. In the new Freedom Square, the Rainbow Nation is represented in the stone from the nine regions laid in a grid of Greek white marble symbolising South African democracy. The area prior to the entrance of Freedom Square, is dedicated to Nelson Mandela who is commemorated in the Mandela fountain.



2.10

2.11

The market is designed as a forest of columns under which informal trading can take place. The slanted columns are reminiscent of trees as an African meeting space in the forest. The columns give the users the opportunity to use the structure to support signage, a temporary roof or even in future a mezzanine level above the trading stalls. This flexibility also accommodates any future changes and expansion. Existing buildings are incorporated in the design, and commercial activity carried unhindered on during construction. This exemplifies how the old becomes useable for the new.



2.18

Local materials were used as a source of inspiration, and also incorporated into the project. Community involvement created an opportunity to foster a sense of ownership. Pierre Swanepoel (Swanepoel 2005) from studioMAS Architects believes that the use of local material can 'weave the town back together'. Local tradesmen made concrete acoustic panels and breeze blocks for the multi-purpose hall, whilst the community's women weaved shade-net for the market area. Using the skills available creates opportunities, but also translates into the aesthetics.

The Square demonstrates how intimately involved design is with political and social relationships. The approach to the design allows each visitor to embrace the future and freedom. The complex illustrates how to build democracy: by constructing identity, and embodying equality.



2.12

2.13



2.17

2.16



2.14



2.15

fig. 2.10. X-motif of light in Freedom Charter Monument
 fig. 2.11. Detail of perspex inlay on entrance pillar
 fig. 2.12. Market complex
 fig. 2.13. Kwashisanyama (food preparation area)
 fig. 2.14. Looking west with the Museum on the right and the Monument on the left
 fig. 2.15. Looking east towards the Monument with the Museum on the right
 fig. 2.16. Entrance columns
 fig. 2.17. Multi purpose hall
 fig. 2.18. X-motif of seating on the square

Theoretical departure is based on Henri Lefebvre's ideas on the production of space, and the relationship of time, space and the social being. Architecture is both produced and reproduced, designed and experienced, and is at once social, spatial and temporal. The main design objective is to incorporate the conception of space as a social product in the city. Space is treated as a reflection of society shaped through the social processes and practices of economies, politics and culture.

According to Lefebvre (1991:137), it is not a question of localising in pre-existing space a need or a function, but of spatialising a social activity, linked to the whole by producing an appropriate space. Activity in the urban centre concretises the life-world which keeps different social space-times together. Lefebvre insists, 'only action can prevent dispersion, like a fist clenched around sand. Generating not simply users or experiencers of, but produced by and productive of, the architecture around them' (Lefebvre 1991:320). He sees different forms of social construction as central to the production of space, in terms of class, gender, ethnicity, sexuality, family relations and age. Abstract space tends to erase these, and should be directed towards restoring them. Central to his thinking on this matter is the body, not just of cultural endeavour but also of self-appropriation and adaptation. The body is useful for thinking about the triad of the perceived, conceived and lived: Spatial practices (perceived), presuppose the use of body, hands, sensory organs, and gestures. Representations of space (conceived), describe the representations of the body, derived from scientific and anatomical knowledge, and relations with nature, while representation (lived experience) express bodies imbued with culture and symbolism (Lefebvre 1991:38-39).

Lefebvre's (1991:33) formulation for the production of space:

SPATIAL PRACTICE

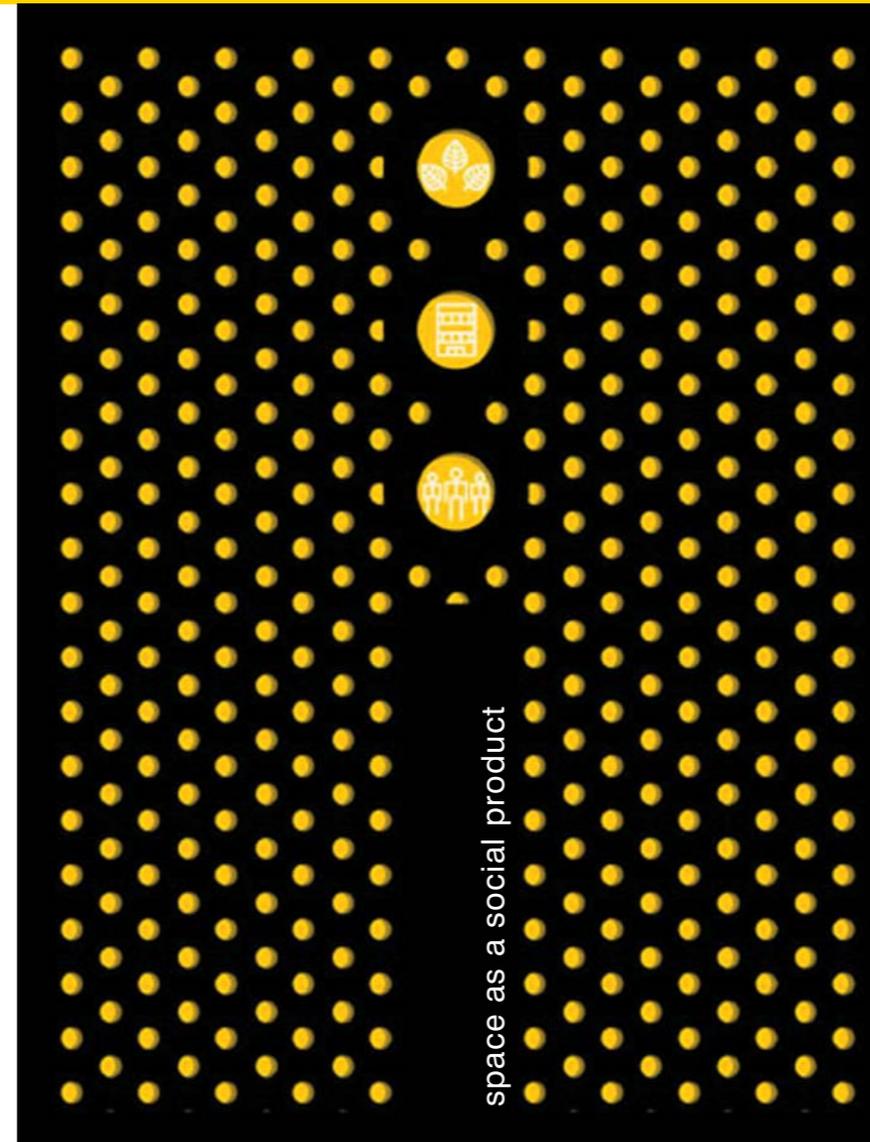
Involves the production and reproduction of material life, including everyday life and urban activities, resulting in various functional spaces. Producing the spatial forms appropriate to different activities, it thereby defines spaces of the everyday. Both a space of objects and things and a space of movements and activities. Lefebvre considers it as perceived space before considering experiences.

REPRESENTATIONS OF SPACE

Relates to the conscious codifications of space labeled by abstract understandings by disciplines to understand abstract space. Representations of space provide the various understandings of space necessary for spatial practices to take place. Space imagined as, 'the concept without life'.

SPACES OF REPRESENTATION

Concerns those spaces experienced as nonverbal symbols and images. Space can be invented and imagined, and are thus both the space of the experienced and the space of the imagination, as lived. Spaces conceived as, 'life without concepts'.



Desired criteria for the production of socially suitable public space, is formulated according to Dewar and Uytendboogaardt's (1991) performance criteria for successful place-making. A core set of needs acts as the basis on which planning, design policies and actions can be evaluated:

- >> A concern for balance, promoting the notion of maintaining dynamic balance in cities – between social and spatial dynamics.
- >> The promotion of freedom for people. Design should provide the minimum necessary constraint required in a particular context to achieve positive settlement form.
- >> Equitable access.
- >> Promoting intensity, diversity and complexity through minimalist approach to design intervention.
- >> Spatial integration of communities and activities to promote choice and flexibility.
- >> 'Community'-place of identity that facilitates positive social interaction.

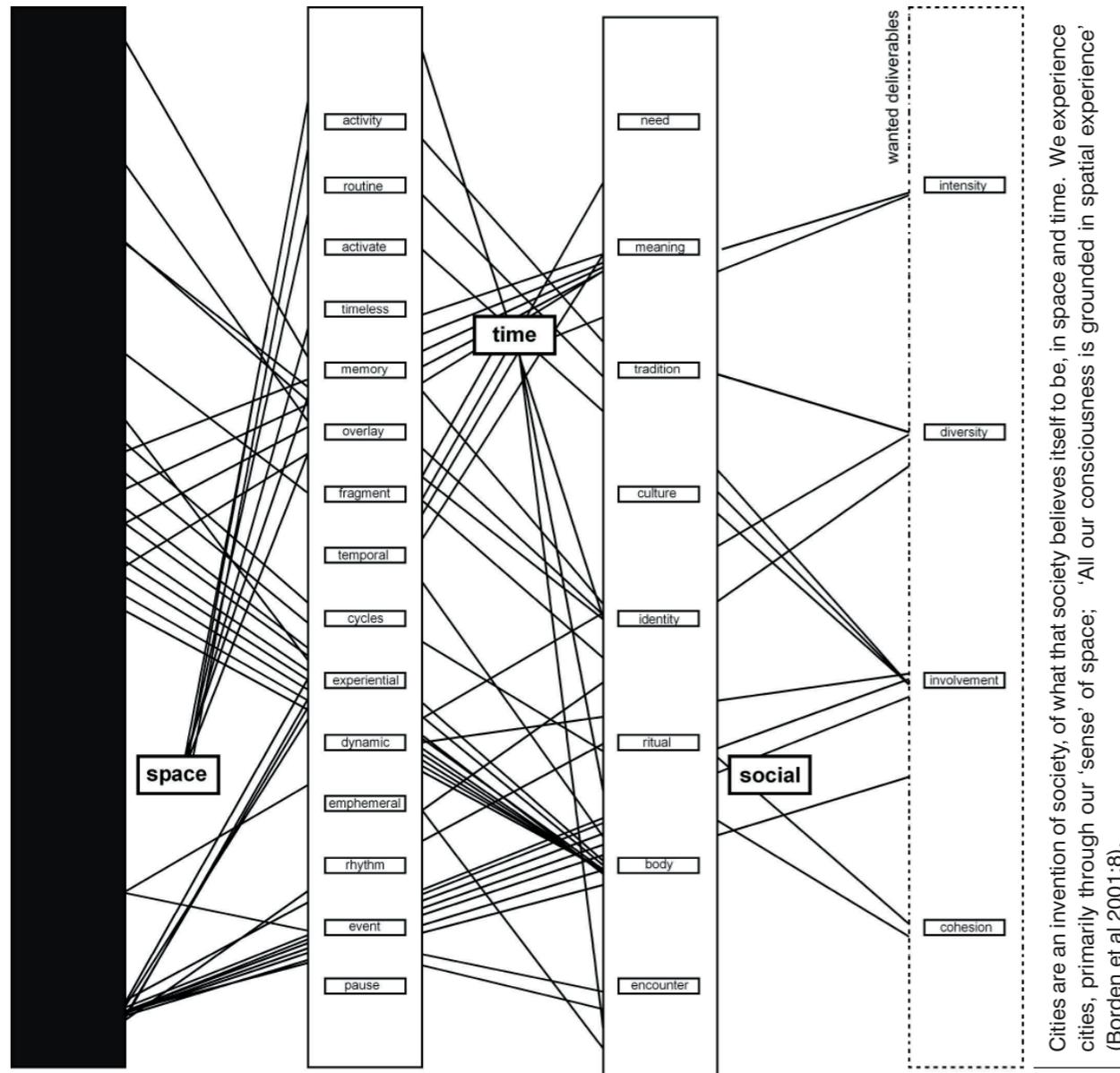


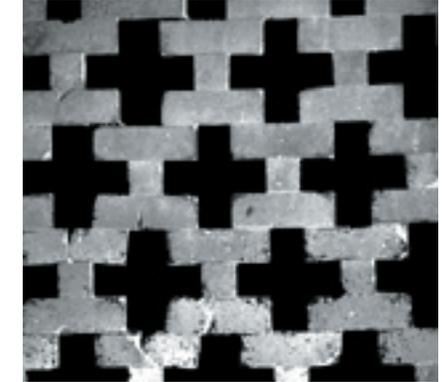
fig. 2.20. Diagram illustrating the relationship between space, time and a social being



2.21



2.22



2.23

'They live time, after all; they are in time. Yet all anyone sees is movements. In nature, time is apprehended within space, in the very heart of space' (Pallasmaa, 1974:95). The notion of 'time in and through space' is essential to Pallasmaa's understanding of social or lived space. He describes social space as 'not a thing, but rather a set of relations between objects and products.'

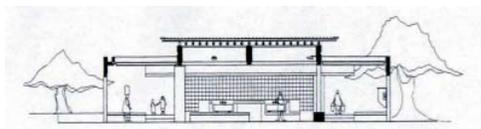
Potential for space identity emerges from an understanding of everyday place experience and the relationship between people and the built environment. Morojele (2002:105) argues for a sanctioned impermanence as a strategic approach to the development of spatial identities in a transitional environment. It requires 'the promotion of baggy space; space that may be experienced as being significant without being prescriptive'. Multiple social uses simultaneously provide different interpretations and increase the potential for ownership of and identity with, new urban spaces. It also weaves space into an existing cultural continuum.

The objective is to articulate space which allows accommodation for the informal, the unintended and the unanticipated, by providing a background for the production of space, enabling a platform for human activity where the architectural meaning can reside in the human experience. Programme should be able to accommodate projects to contribute not only economically, but also by continuous human activity as generator of shared public space. Multiple social uses will provide simultaneously different interpretations and increase the potential for ownership of, and therefore identity with, new urban spaces. Ian Borden believes that social existence should enable self-production and self-determination - so that people make lives for themselves, and not simply adapt to the natural circumstances. He adds that as a social being must inevitably involve space, it follows that it must also involve consciousness and experience of space (Borden et al 2001:8).

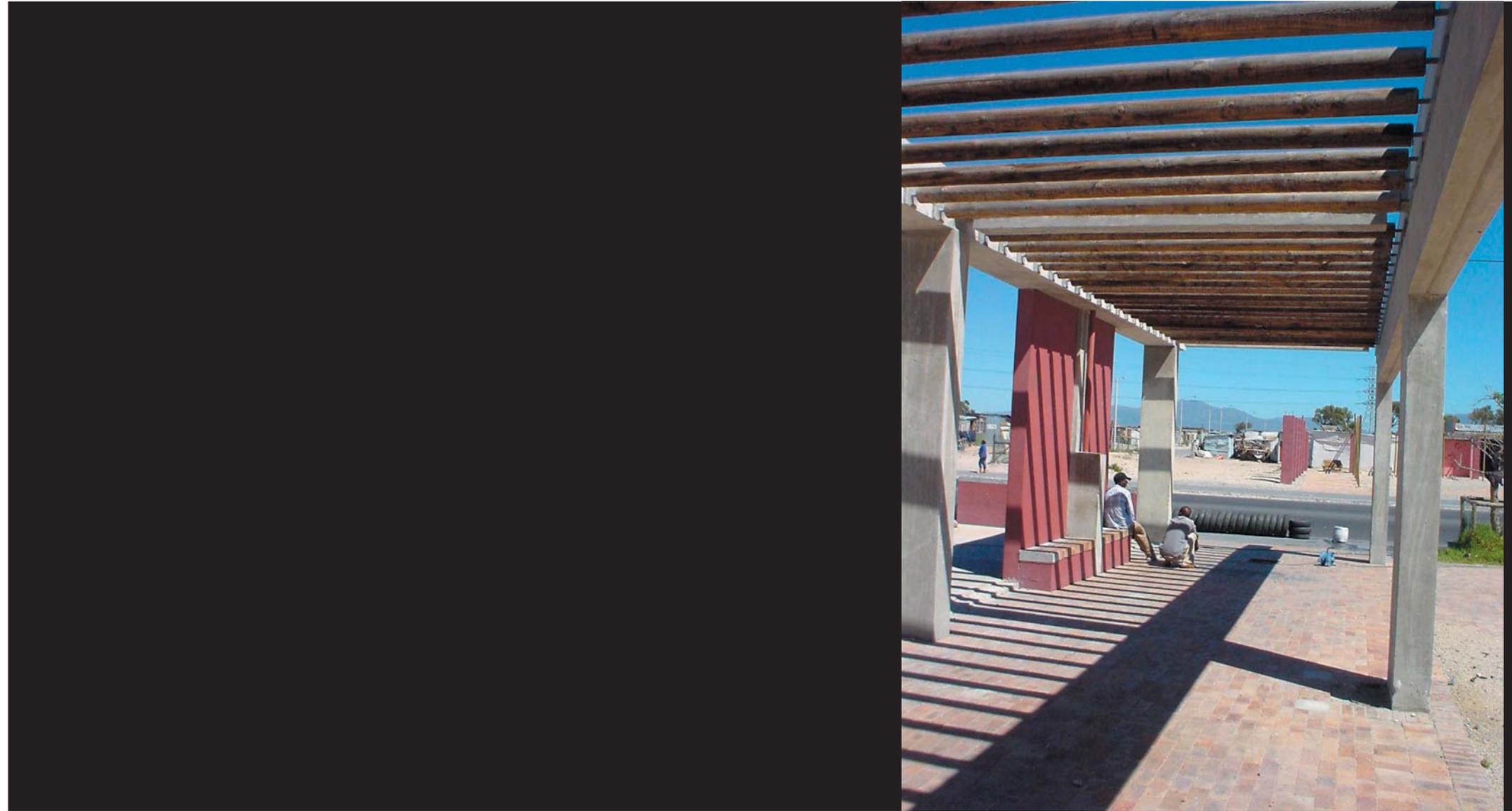
Space is temporal because we move through it; time is spatial because space can be constructed. It is through space that we are capable of addressing time. But time also exists to activate our spaces, occasionally transforming them by challenging perceptions of their boundaries (Bernard Tschumi 2000:19).

PHILIPPI LANSDOWNE PUBLIC SPACE PROJECT
Cape Town South Africa
Du Toit & Perrin Associates
completed 2002

fig. 2.24. Elevation of utilitarian area
fig. 2.25. Covered walkway



2.24



2.25



2.26

2.27

2.28

fig. 2.26. Forecourt
fig. 2.27. Informal housing in area
fig. 2.28. Concrete frame of covered walkway

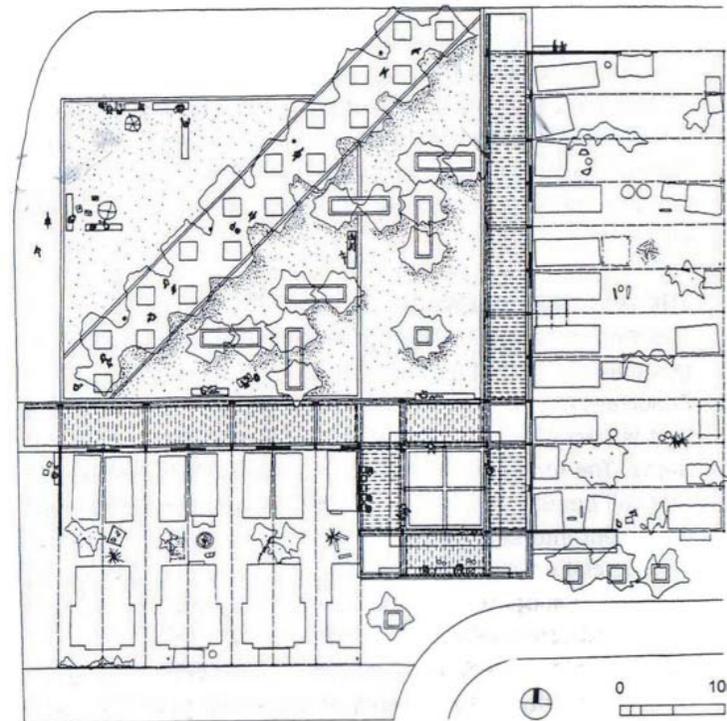


fig. 2.31. Site plan

The success of the public space lies in the habitability of the urban spaces by accommodating everyday activity. Strategies to improve habitability firstly include making public space into furniture, so that people can sit, play, cook and eat on or in it. Design considerations include walls of the correct height and width to accommodate above. Secondly, different kinds of space are necessary with differing degrees of enclosure and shelter. The project provides different components of exterior space (edges, level changes, sheltering elements, lighting) organised to make subtle differentiation for various users to occupy them in various ways. The structure acts as defining element of the public space which announces it. The success of a public project depends on more than design considerations and adaptability. Community participation is needed and should be empowered through the process from initiation to completion. Public ownership is desired in order to ensure occupation.

The Philippi Lansdowne Public Space Project, forms part of the ‘dignified urban places’ programme of the city of Cape Town, launched in 1999. Conceived to transform the ‘black townships’ by redressing the urban poverty established by the impoverished spatiality of apartheid’s policy of segregation, this programme intends to improve these environments by ‘bringing them to the standard’ enjoyed by privileged areas (Low 2005:150). The spatial agenda of segregation inevitably influenced the new spatial agenda to be one of integration. The programme focuses on the public realm through the development of places for integration where a range of human encounters can take place, including a variety of spatially linked interventions in the area consisting of a transport interchange, bathhouse, community centre and social facilities.

Du Toit and Perrin Associates advocate architecture as part of an informal-settlement in the Public Space Project in Philippi Lansdowne. The spatial challenge being the creation of something that will contribute to the broader public and allow the spaces to be appropriated by the community. The solution is an informal urban landscape that provides for a basic level of dignity and well-being at a collective place to gather water, to wash, to learn, to socialise and to set up shops. The design consists of a public forecourt with planted trees and benches, acknowledging the prominent intersection. The forecourt is framed by a number of covered sites (4 by 20 metres) accommodating growth of a range of informal activities to the rear. These sites benefit directly from their location adjacent to the intersection as there is potential for an active commercial environment (Du Toit & Perrin 2005:56). The concrete frame can accommodate the construction of double-storey units and provide opportunity for future live-work arrangements. A covered general well-being area is a place for gathering and supportive of everyday activities containing laundry tubs and public phones. The building provides more than utilitarian facilities, where the footprint creates a place of public significance by interaction to activities around it. The contributing elements are the covered external spaces which provide shade as well as shelter from rain and the use of steps and low rise walls as informal seating and general spaces to congregate.

The framework is geared towards interpretation and the facilitation of growth and adaptation over time. The materials and surfaces articulate a level of robustness to sustain phases of adaptation. There are a number of important urban space-making elements present in the public-space project. Distinctive space has a quality of enclosure which implies that it has clear boundaries defining inside and outside, but can still be visually and physically connected with other space. Boundaries differ from a complete view obstruction to a subtle edge such as screens, trees, paving or even a water channel. Emphasis on boundaries offers importance to openings and thresholds between one space and another. Spatial hierarchy plays a role in how space identifies to the surroundings and built fabric and variety in terms of different kinds of space from formal/informal to centered spaces, in-between spaces and edges.

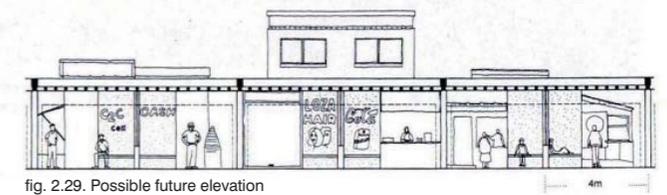


fig. 2.29. Possible future elevation

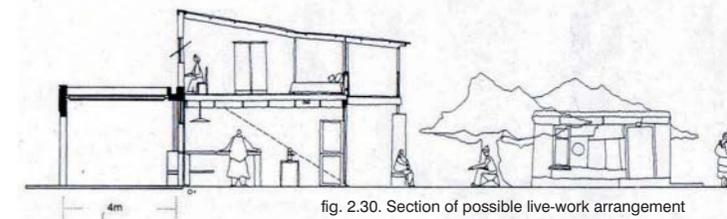
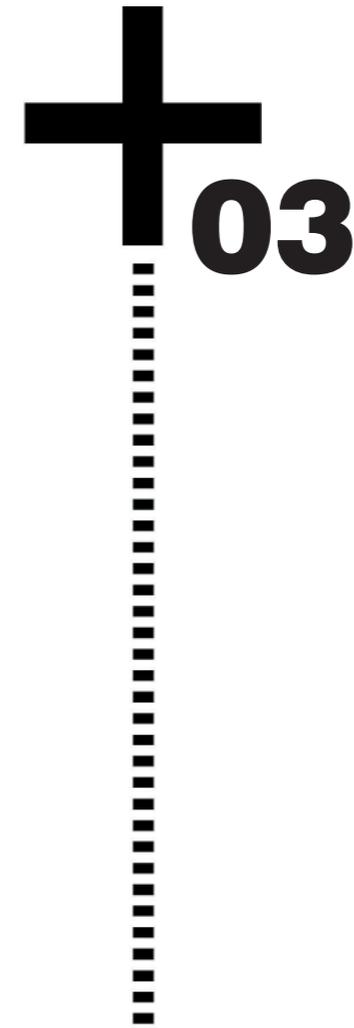
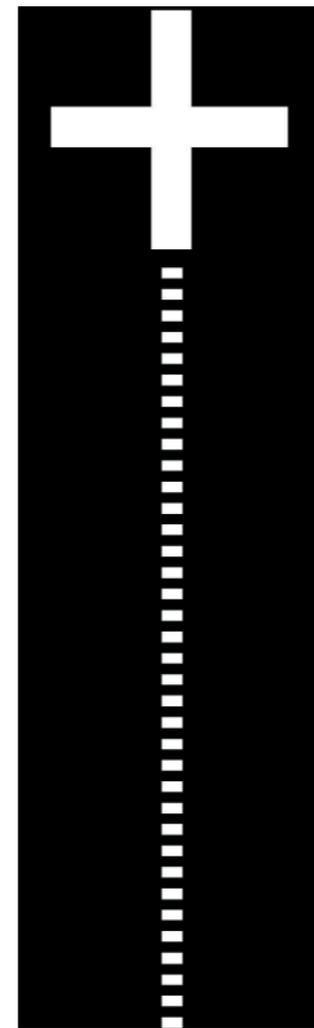


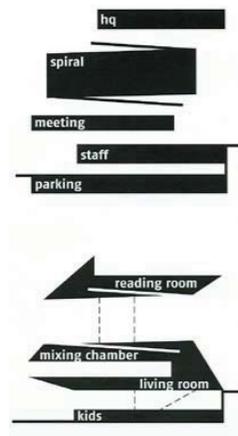
fig. 2.30. Section of possible live-work arrangement



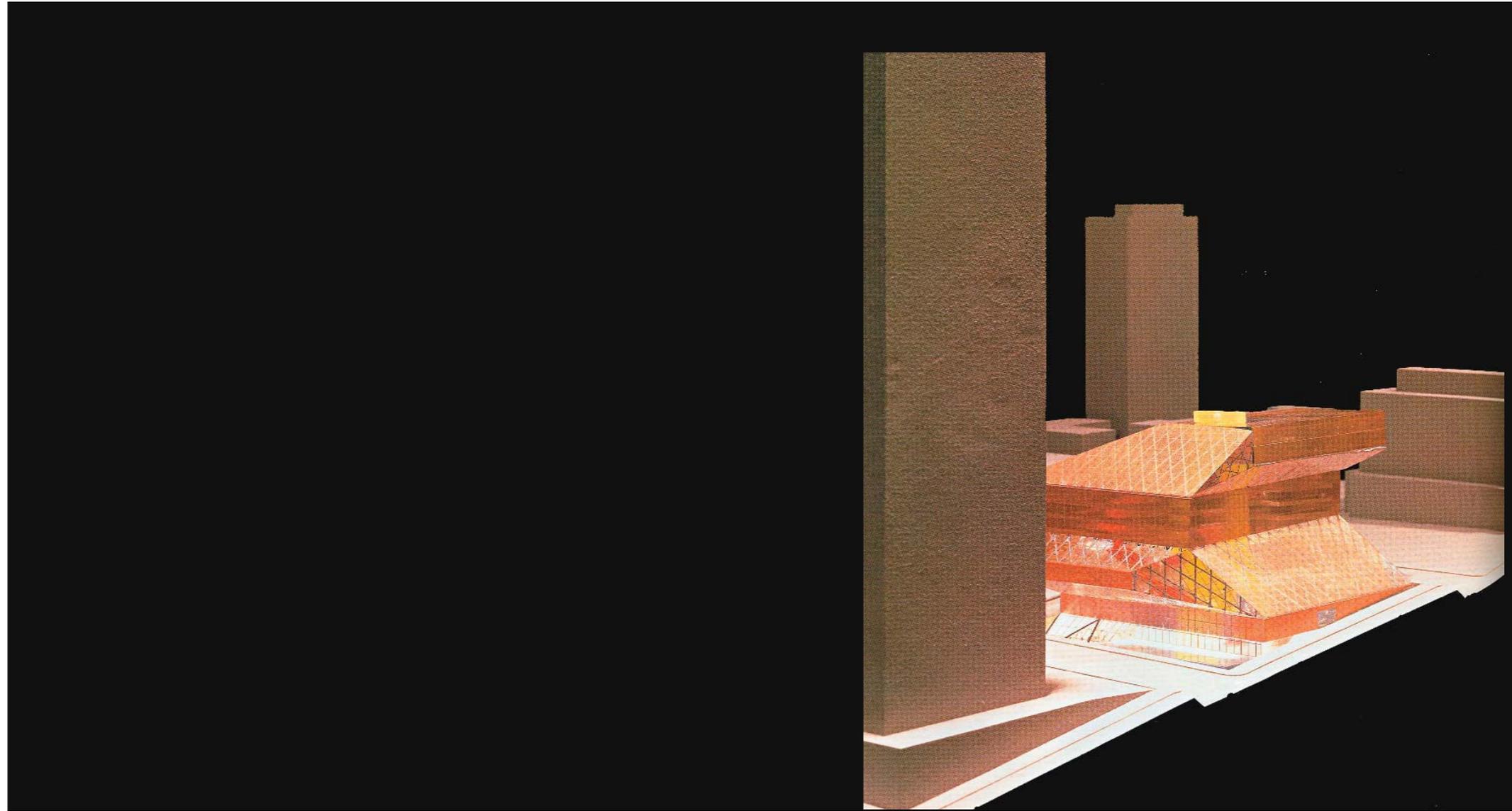
update

SEATTLE CENTRAL PUBLIC LIBRARY
Seattle USA
OMA
Completed 2004

fig. 3.02. Programmatic clusters
fig. 3.03. Model of Seattle Central Library



3.02



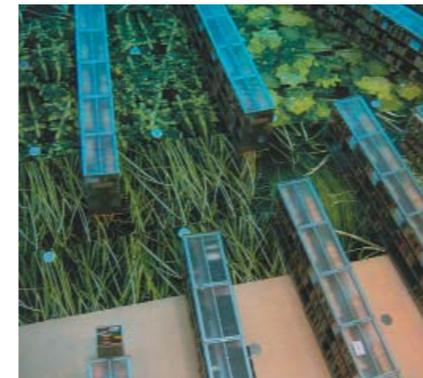
3.03

An American media-equivalent library is well presented in the Seattle Public Library, designed by Rem Koolhaas. The central idea is to redefine the Public Library as a community hub, by playing an integral part in metropolitan life. This objective enables the library to become a place for encounter and exchanges, in short, a modern-day agora.

Koolhaas follows a radical different approach to function and programme. Programmes are consolidated into unitary chunks (Stadler 2004:30) and then grouped into a series of programmatic clusters, consisting of a 'stable' and 'unstable' platform. The 'stable' functional areas with predetermined purpose include a headquarter, circulation(spiral), meeting, staff and parking area, whilst the reading room, mixing chamber, living room and kids section form the more flexible, 'unstable' platform. The transforming, 'unstable' programmatic clusters form the interface between the functional layers of the building. Technological and social needs are met through these platforms. Programmes are allowed to expand inside their assigned areas without invading areas allocated for public space. Koolhaas (Stadler 2004:30) suggests that the in-between spaces should function as 'trading floors' or market places for information. The contact with information and accommodation of public space is therefore important.

The library is seen as a public place where one can either go to be 'updated', to eat and drink, talk or play music, or even relax or attend public events. The Living Room, located on ground floor is the largest public space in the building containing the fiction stacks and a café. Visitors have an unrestrained panoramic view of Seattle from the Reading Room on the 10th floor. Here one can read a book whilst the exterior invites you to city life. The third public space, the Mixing Chamber, is the reference area where searching for specific books takes place and librarians provide support in sourcing information. The space has been configured as a 'trading room' where library staff can 'trade' knowledge and information directly to visitors (Uehara 2004:84). Directly above the Mixing Chamber is the library's most innovative feature, the Book Spiral. A ramp houses a square spiral of books numbered from 000 to 999. The new classification allows a continuous flow of books over four levels, and encourages random discovery (Olsen 2000:125).

There is a continuous sequence between the interior and exterior. Interior spaces are considered as 'folded plains', where the outside vegetation around the building is seen as a 'folded landscape'. A visual dialogue is created between inside and outside as landscape motives and textures are continued inside on carpet insets of photo-realistic silk screens of grass and plants. All five platforms are visible from the 10-storey tall atrium. The images of grasses and plants are so large that they can be recognised even from the top of the atrium, providing a visual dialogue between top and bottom. Glass facades create interactive facades with the urban life on the sidewalk. All activities are visible from outside making the building porous to city energy and movement.



3.04



3.05

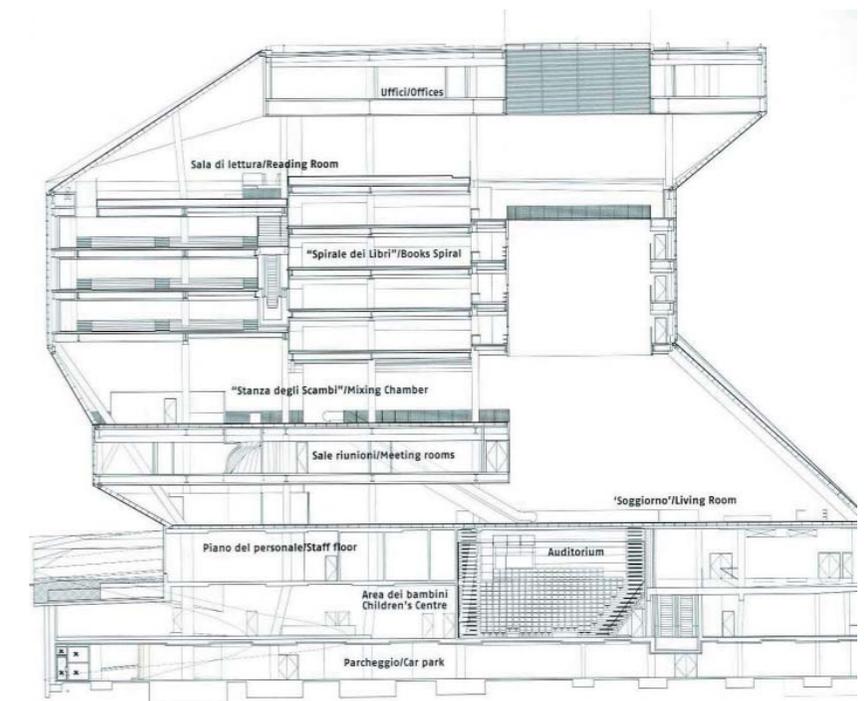
fig. 3.04. Grass and plant printed carpet in the Living Room
 fig. 3.05. Dialogue between interior and exterior
 fig. 3.06. Model
 fig. 3.07. Section showing the different areas
 fig. 3.08. Reading Room
 fig. 3.09. Rubber number inlays guide the way in the Book Spiral



3.09



3.08



3.07

IDEA STORE AS A LOCAL RESOURCE

The Tower Hamlets Council in the UK is investing millions of pounds in its Idea Store strategy to create a network of library, information services and adult education located in local shopping centers in the Borough. The unique, branded image of 'idea' is used to attract customers used to branding techniques in order to bring the best of public libraries to a wider audience. Set to replace all older libraries for the London Borough of Tower Hamlets, the Idea Store is designed to be accessible and engaging as a department store. They are placed in shopping areas to be in more accessible locations than existing libraries. In turn, the Stores are used to regenerate the local shopping areas in which they are located. The Stores are more than just a library or a place of learning, and provide a greater range of services than existing public libraries. They offer a range of adult education classes, along with career support, training, a crèche, study areas where homework can be done, meeting areas, arts and leisure activities. The Stores even have a cafe, modern baby changing facilities and a 'Sight and Sound' centre where you can borrow a wide range of music, video and DVD releases.

The first Idea Store in Bow, east London, is a refurbishment of an existing building and the second in Chrisp Street Market is designed from scratch by British architect David Adjaye. The exterior of Adjaye's praised Store is mostly glass, with panels in five shades of green and five of blue. Adjaye aimed for 'a certain kind of beauty that communicates' (Moore, 2004:6). He explains that the exterior is shop-like because good shops give you the desire to be in them, and the Idea Store is trying to do the same. Set in a nearby concrete shopping centre and housing estate, the coloured glassy building is translucent and light against the opaque surroundings. Interior finishes are dominant timber where recycled plywood are used for the exposed ceiling beams and stairs. It offers a warm and inviting environment featuring a bright colour scheme, comfortable sofas and circular snugs for young children and parents. Workstations are combined into the open plan space and moveable book units make browsing easier.

Adjaye's approach to create a civic space, where visitors can wander and explore is evident in the building's engagement with the public realm. The freedom to find your own way, through engaging with various activities, is what successful public buildings should offer. The holistic approach to the information, learning and leisure needs of a community should be a model for future endeavours.



3.10



fig. 3.10. Idea Store in Bow
fig. 3.11. Idea Store in Chrisp Street Market

3.11

IDEA STORE
London United Kingdom
Adjaye Associates
Completed 2002

DEVELOPMENT OF CONTEMPORARY PUBLIC OPEN SPACE

Defined as the sites and settings of public life, the public realm functions as a common ground for social interaction and communication, as well as a stage for social learning, personal development, and information exchange. The public realm includes all the spaces accessible to and used by the public, including external public spaces like squares and parks, as well as internal public space in public institutions such as libraries and museums.

The square is an important organising form of urban space, as well as an important public space in the city. Open space in the city provides for necessary relief from congestion, but need not be ill-defined and physically diffused. During the 20th century the concept of public parks and places have shifted and can no longer be separated from the concept of the city. Parks and public places became part of the vision of the city, integrated in the urban fabric and generative of urban energy. These areas remain a key attractor for a variety of people, events, collective expressions and programmes, but what comes out constantly changes, adapts to new trends, forces, desires, and it multiplies in its adaptations over time. The proliferation of the use of public space increasingly gives form to society. The proposed intervention should be a combination of form and operation that together create architectural space and quality which provide a link between architectural space and urban, social dynamics.

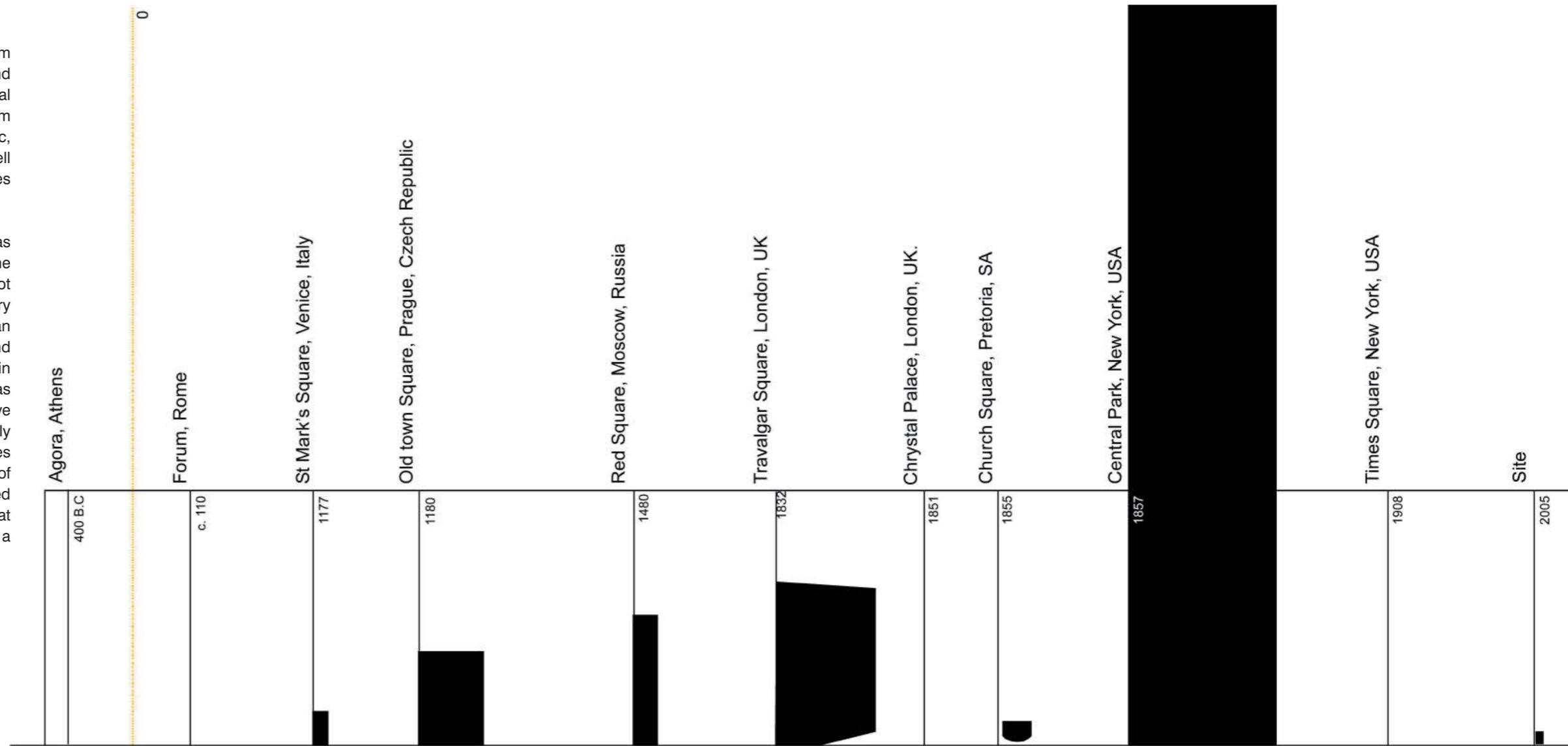
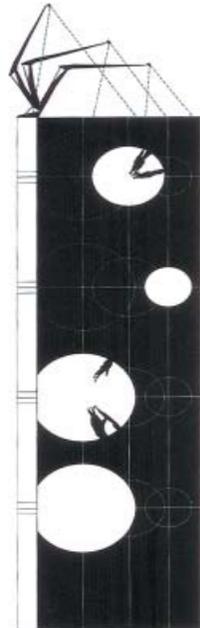


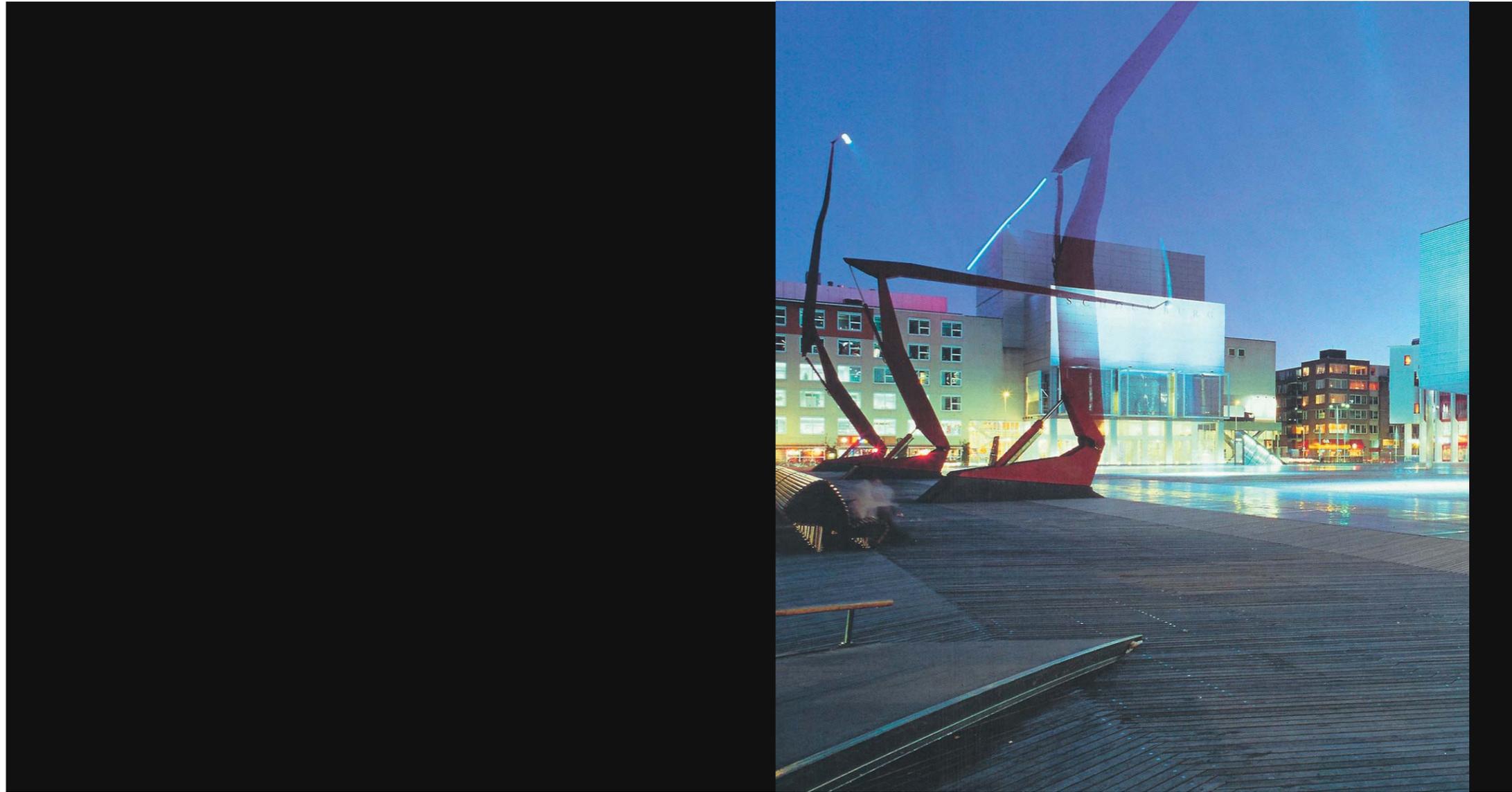
fig. 3.12. timeline and sizes of successful public squares

SCHOUWBURGPLEIN
Rotterdam The Netherlands
West 8 Urban Design &
Landscape Architecture
Completed 1996



3.13

fig. 3.13. Diagrammatic lighting plan
fig. 3.14. Hydraulic lighting masts



3.14



3.15



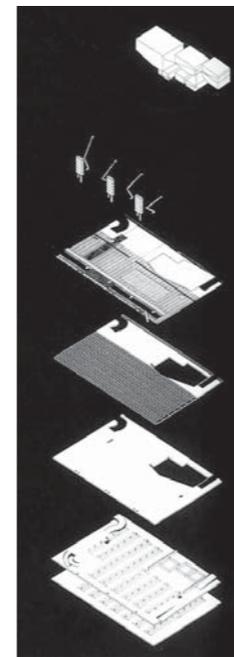
3.16

The Dutch landscape architect Adriaan Geuze of West 8, wants to reconcile city-dwellers with their environment as he believes in public spaces as places for emotional release: 'The users of a space should be actors, not spectators...the public spaces in cities drain users of their intelligence as they are always following signs and told what to do' (Reed 2005:17).

West 8's Schouwburgplein project in Rotterdam reinvents a dilapidated post-war site as a city stage which is a polemical statement on the role of public space in contemporary urban culture (Reed 2005:17). The project is a reinterpretation of the traditional town square with moveable lighting columns and varying flooring materials, encouraging users to control and interact with the space.

The project illustrates the reinterpretation as a place for public participation in unprogrammed activities rather than passive spectating. The plaza is slightly elevated above street level in order to create a distinct boundary and ensure a pedestrian only area. The space is divided into several zones, differentiated by furniture and surface materials, including wood decking in a herringbone pattern, an epoxy floor embedded with silver maple leaves, and perforated metal floor panels that allow light from the parking garage below to filter through. The spatial approach taken by Geuze is simple; identify the borders and liberate the center to ensure interaction.

fig. 3.15. Seating
fig. 3.16. Maple leaf inlay
fig. 3.17. Axonometric layer exploration
fig. 3.18. Aerial view



3.17



3.18

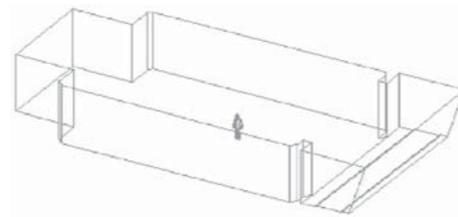
CONTEMPORARY URBAN SPACES

New forms of public life require new spaces. The following two examples of public interventions illustrate that the use of public places can be seen as a function of its quality as a supportive and conducive environment. New York offers a couple of small, so called 'vest-pocket parks' that make a significant contribution to the quality of urban life in midtown Manhattan. Paley Park was the first of these to come to realisation in 1967. Visited by a variety of people, this 12m by 30m space extends into the sidewalk, which subtly announces its presence to passers-by. Surrounded by high-rises, the park is a welcome retreat from sights and noise of the city, with a feeling of calm about the space. A waterfall provides a focal point whilst its noise blocks out the sounds of the city and creates a sense of quiet and privacy. Trees provide adequate shade in summer and moveable chairs and tables allow people to relax where they are most comfortable.

Another popular visiting spot in New York, attracting over 100 000 visitors a week, is Greenacre Park, designed by Sasaki Associates. The park is only as big as a tennis court with a design which is based on multi-level sitting areas integrated with planting and a water display. A roofed terrace provides lighting and radiant heating for evening and cold weather use. These small parks demonstrate the importance of and act as models for meaningful open space and useable interventions in the design of urban environments.



3.19



3.20

fig. 3.19. Seating in Paley Park
fig. 3.20. Axonometric diagram of Paley Park
fig. 3.21. Seating area in Greenacre Park
fig. 3.22. Entrance to Greenacre Park
fig. 3.23. Section through Greenacre Park

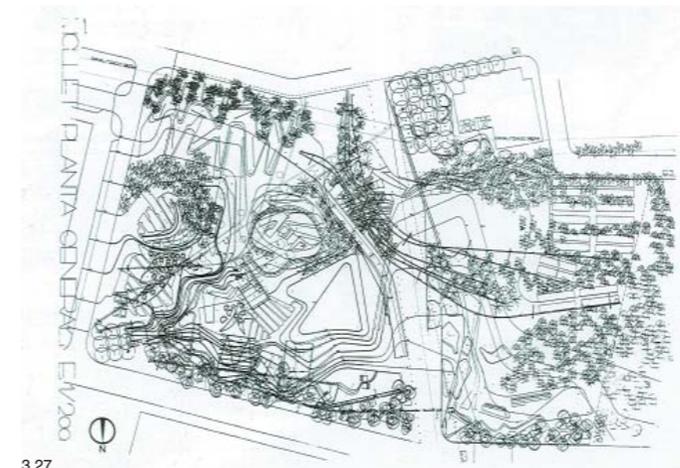


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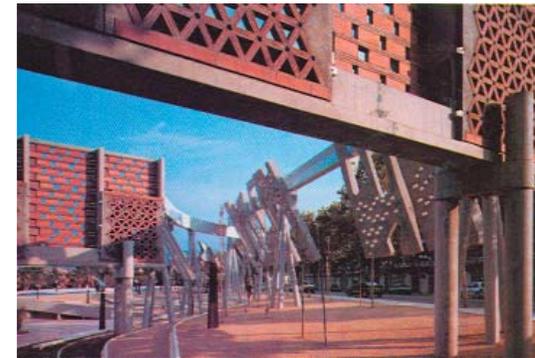
3.21

Barcelona's network of urban parks, played a vital role in the city's regeneration, bringing life to neglected parts of the city. The Parque de los Colores (Park of colours) by Enric Miralles and Benedetta Tagliabue, is typical of this programme. The area's lack of character demanded a redefinition of the site and a sense of place to transform it into a shared public realm. The approach was to create a social landscape by creating a meeting place and stage for public activities. The layered surfaces are interrupted by a series sculpted, concrete pergolas, creating shaded zones and paths, redefining zones of activity. Together with the pergolas, mosaic-lined pools and compact masses of trees define the different parts of the park. The vegetation is treated as structural elements in between patterned and coloured paving to break up open spaces.

The park is a series of colourful incidents and events that forms a vivid backdrop to everyday life. Through its combination of different textures and the ever changing lights and shadows, the park appears shimmering and unpredictable. This example of a social landscape acts as a metaphor of the multiple aspects of the city, reflecting its mission as a successful urban intervention.



3.27



3.24

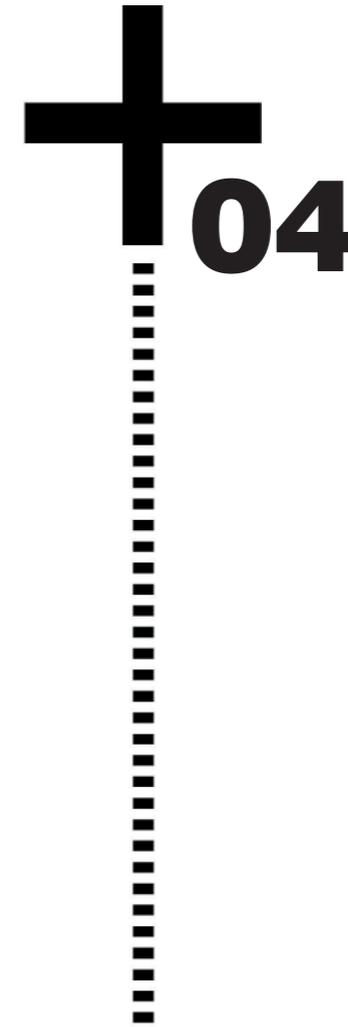
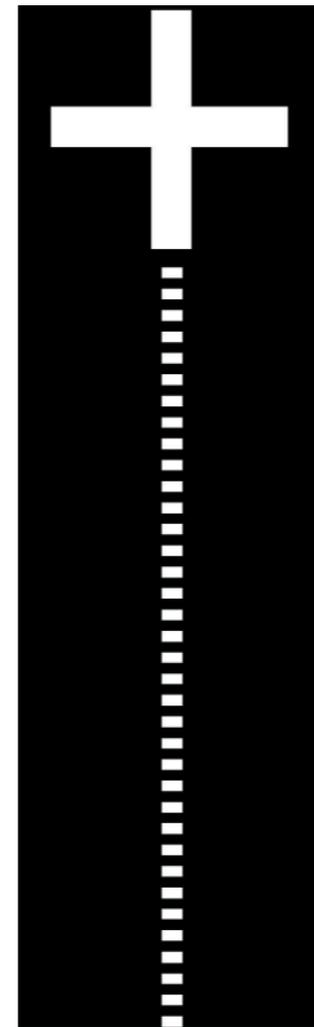


3.25



3.26

fig. 3.24. Concrete Pergola
fig. 3.25. Generative sketch of park design
fig. 3.26. Pergola with mosaic-lined pool in background
fig. 3.27. Siteplan of Park of Colours



propose

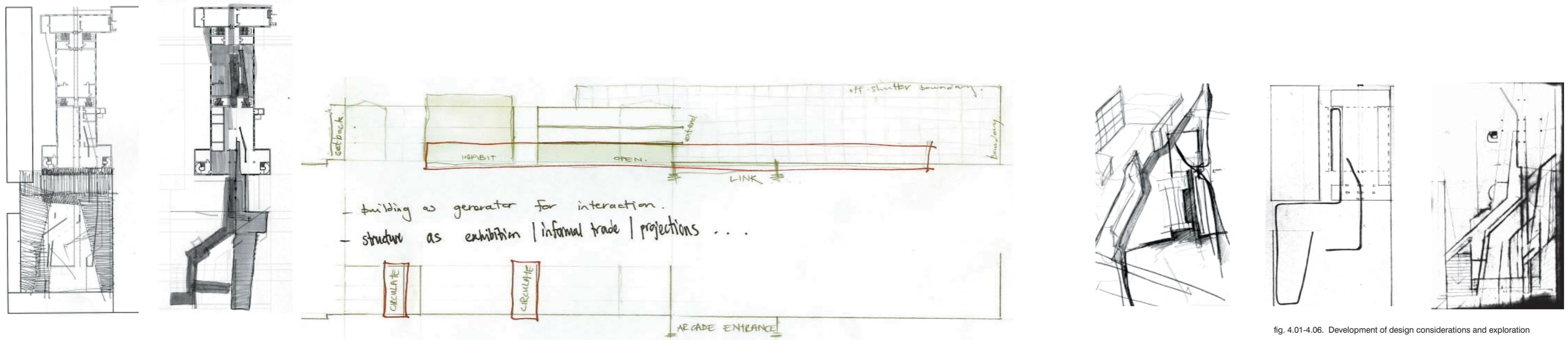


fig. 4.01-4.06. Development of design considerations and exploration

DESIGN DEVELOPMENT

The study attempts to redefine the design process and to show that it can no longer be seen as a homogenous, linear system. It introduces inclusiveness in the design approach, together with an integration of construction, circulation and programme. Inclusiveness allows fragmentation to be absorbed into a coherent, continuous approach.

The design development manifests in three phases. Site investigation in phase one explores all possible expression of public presence without accepting or rejecting any possibilities. The main objective being to collect all fitting clues from the three sites in order to propose a design intervention on one of them. The clues include the present site characteristics, desired site criteria, activity and the desired impact and involvement on each site.

Site involvement is reduced in phase two to only one site. The programmatic proposal generated from the event matrix indicates that the intervention should be an infill of action, thought and emotion, in order to generate a successful public realm. Although the degree of presence varies, all three above activities are present on the site, and intention being to incorporate all three in the proposed design. The infill site is chosen for its unique characteristics, being an unnoticed mid city block whilst holding enormous potential to be more accessible and integrated into the public sphere. Its distinct characteristics of the unpredictable, accidental and unknown space, presented an opportunity of an infill of public presence on the site as a spontaneous activity.

Possible integration of the existing library building and surrounding fabric adds to the positive attributes of the site. New awareness and life can be inserted into the area through the integration of the existing. The adding of another layer of activity by responding to the existing contributes to the character of the city.

Programmatic development in phase two includes the manifestation of public space as an open platform to allow users to inscribe their own scenarios of occupation and identity through their interaction. Accommodation focuses on the practices of daily life, inviting society to use the area as an extension of their living room.

Phase three implements the desired characteristics in terms of the broad investigation, the programmatic response, and lastly the manifestation in tectonic expression. The approach to interpretation of the design, follows the interconnection and relatedness of characteristics and desired activity from all three sites. The interpretation of the series of designed spaces is linked by the guiding terms infill, insert and reroute.

The intervention can be described as an infill in the gap, extending and plugging (inserted) into the existing library building. The peripheral infill of the staircase blocks is inserted into the pan-handle and visually connects the intervention in the gap with the intervention in the building. Existing pedestrian presence in the arcade is rerouted through the site and into the building.

Approach to interpretation of the programme relates to the idea of a sequence of events, where the user becomes part of the activity. The programme is represented by events based on action, thought and emotion to improve the current urban condition.

Respectively action relates to pedestrian movement, involvement and re-use of the existing. It is expressed through the flexible areas for circulation and seating. Thought is concerned with information and the use of the memory of knowledge of the existing library. It is evident in the Knowledge Room intervention in the building. Lastly emotion responds to human interaction, present in the principal function of public space as space for social encounter.



4.07.



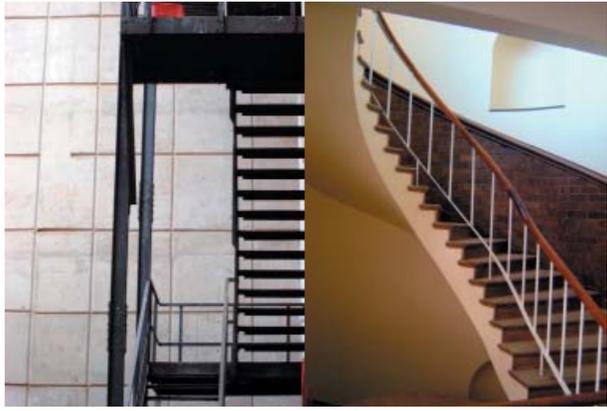
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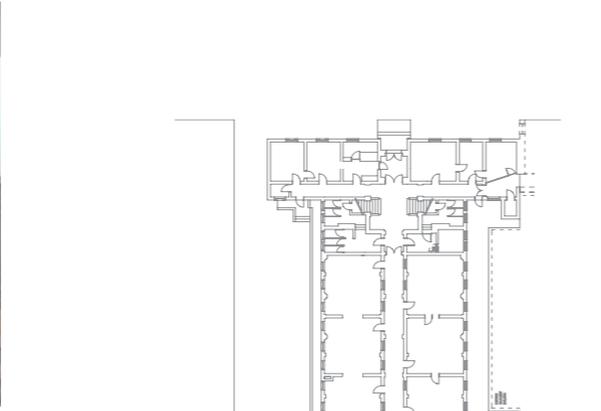
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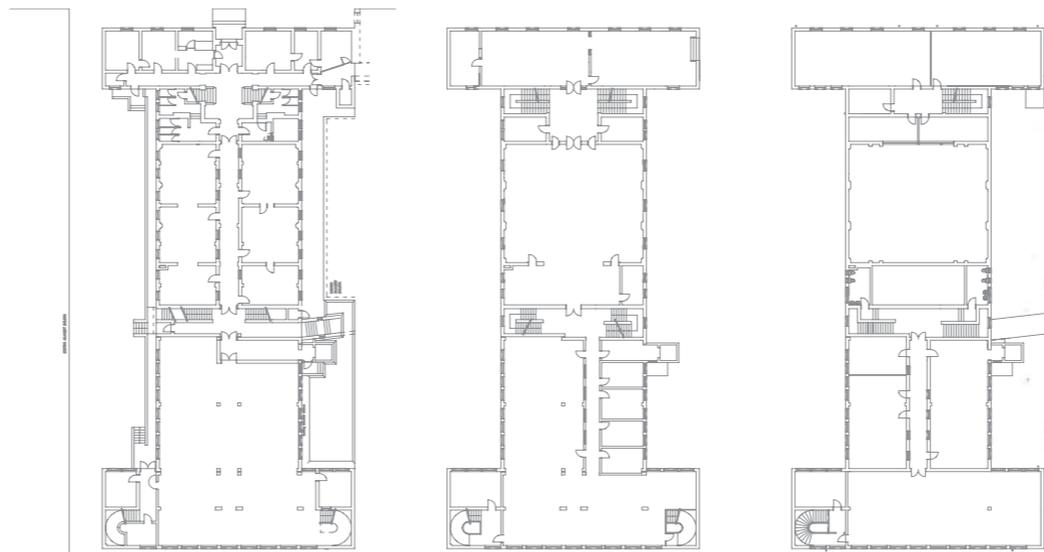


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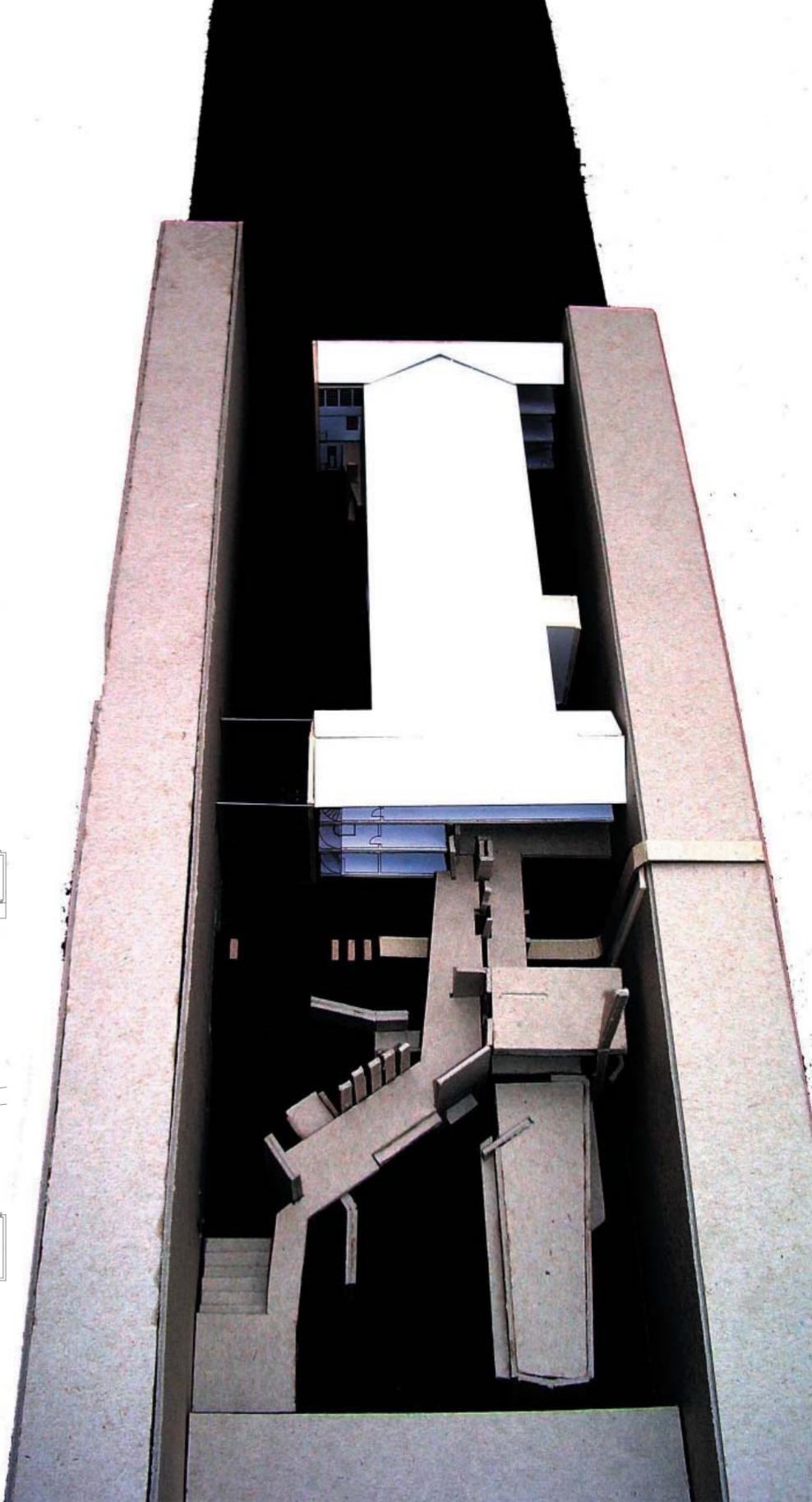


4.11.

fig. 4.07.- 4.09. Noordvaal thoroughfare
fig. 4.10.- 4.14. Surrounding fabric
fig. 4.15. Original floorplans of National Library of South Africa
fig. 4.16. Site model



4.15.



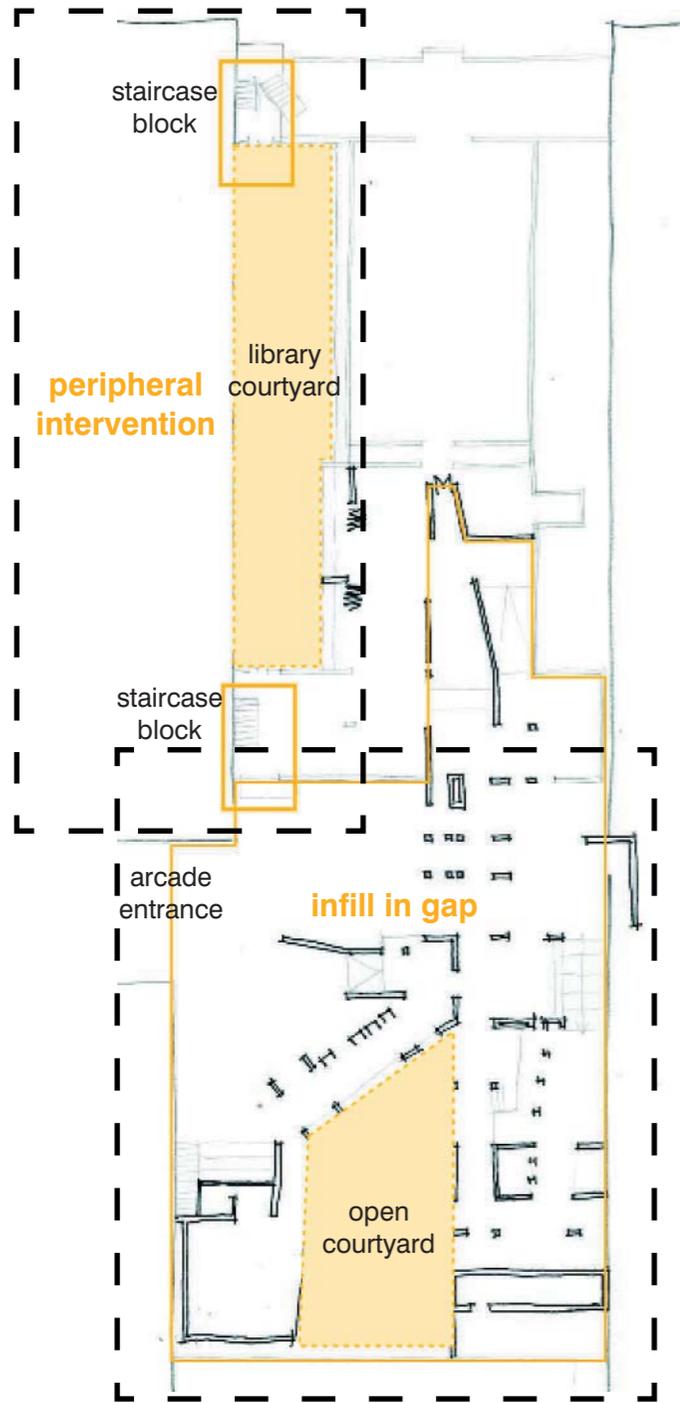


fig. 4.17. Intervention on ground level

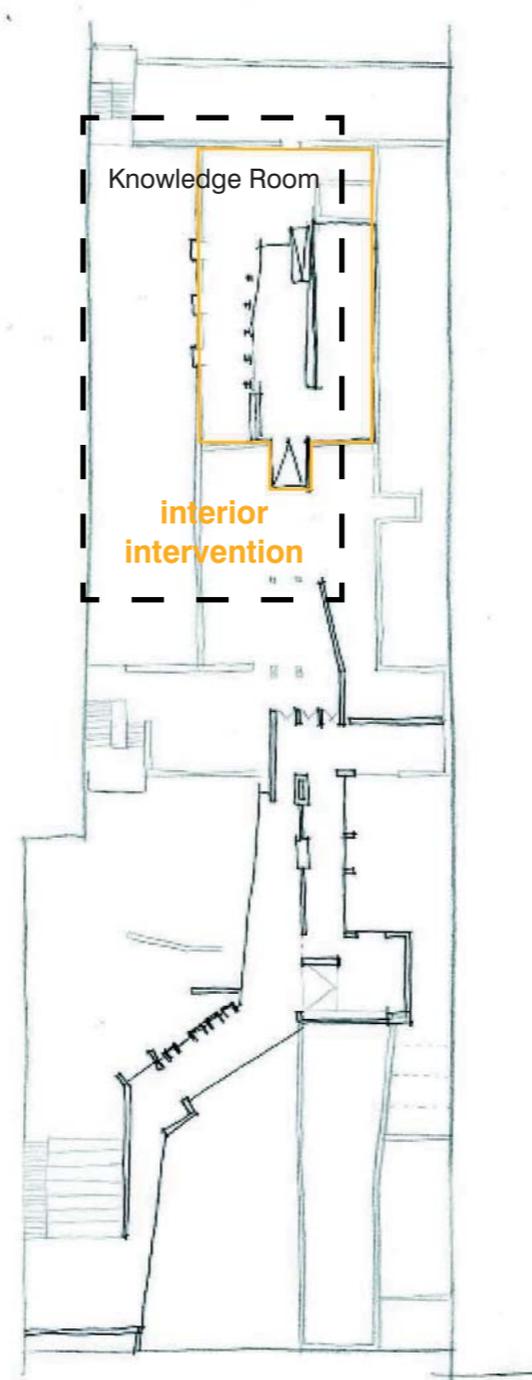


fig. 4.18. Intervention on first level

The design proposal deals with the design interpretation of a series of multi-faceted spaces. The proposed site is surrounded by walls, most notably the 12m off-shutter concrete basement wall of the Old Mutual Building. The design is respectful of the existing fabric. Intention not being to replace the existing, but creating a supportive background for human activities and perception. The design consists of layers of involvement placing greater importance on activity and engagement than structural significance.

The design consists of three core interventions. The first resides in the urban gap, the second alters an existing space in the library building, and the third locates on the side of the library building in the pan-handle. Related interventions allow fragmentation to be seen as part of an inclusive approach.

The infill structure in the gap has a distinct modesty of scale in relation to the existing built fabric on site. The intervention is perceived as an infill of utilitarian surfaces around an open courtyard. The composition of inhabitable surfaces connects the arcade with the void and the existing building, creating different route possibilities through the site. As one moves through the area towards the concrete boundary wall, the degree of exposure and activity reduces, generating a variety from public to less public spaces. The structure is not perceived as form, but as a process directing the visitor through the area, as it punches through the southern facade of the library building on ground and first floor level, providing public access to the previous inaccessible building.

Current operational layout of the library building is accepted, and interior intervention is concentrated in one selective area where the intervention changes the perception of the barrel vaulted volume of the library's Macfayden Hall. New composed elements propose a new identity and new use of the space.

Two transparent spatial closures define the peripheral interventions located in the pan-handle. These staircase blocks inserted on both ends of the pan-handle extend the available circulation space and create a private courtyard for library use. The interventions on the side of the building contribute to the cohesion of the other two interventions through support of the insertion in the gap and the completion of the involvement in the building.



fig. 4.19. Model of interior intervention on ground level



fig. 4.20. Model of interior intervention on first level

Layout and function

open courtyard

- > three courtyards varying in character
- > exposed to elements
- > seen as overflow spaces from other areas of site
- > provides informal seating

>> courtyard areas function as city rooms, inviting various interpretations of the space.

cafe/bar area

- > operation approached with great surety as tentative spaces, but with a variety of possibilities
- > kiosk, cafe, bar used as most probable tenants

>> rigid hard fibre provides the basic structure and services, presenting the opportunity for the user to interact and associate with useable levels

>> a source of economic opportunity through the integration of the programmes of the formal and informal economy.

Knowledge Room

- >> facilitation of electronic information retrieval and promotion of technology by means of interactive plasma screens and internet access
- >> functions as support system for library building

walkway

- > serves as a connection spine into the site, providing access to all areas
- > accessible on ground and first level
- > doubles as viewing platform, seating

>> the walkway ensures the usability of the area as an exterior social space, providing usable surfaces and linking the various functions.

ablution

- > accessible to all, safe and hygienic
- > maintained as communal facility
- employment opportunity
- > timber screen provides visual privacy

>> each individual toilet cubicle opens to a communal handwash area, providing sufficient ventilation and light. Partial visual connection to courtyard provides eyes on an otherwise dangerous area.

staircase blocks

- > vertical circulation in building
- > visual link to both street facade and courtyard area
- > source of light

>> the transparent elements announce an intervention from Vermeulen Street by connecting street activity to interior circulation.

-  open courtyard
-  walkway
-  ablution
-  cafe/bar
-  staircase blocks
-  Knowledge Room

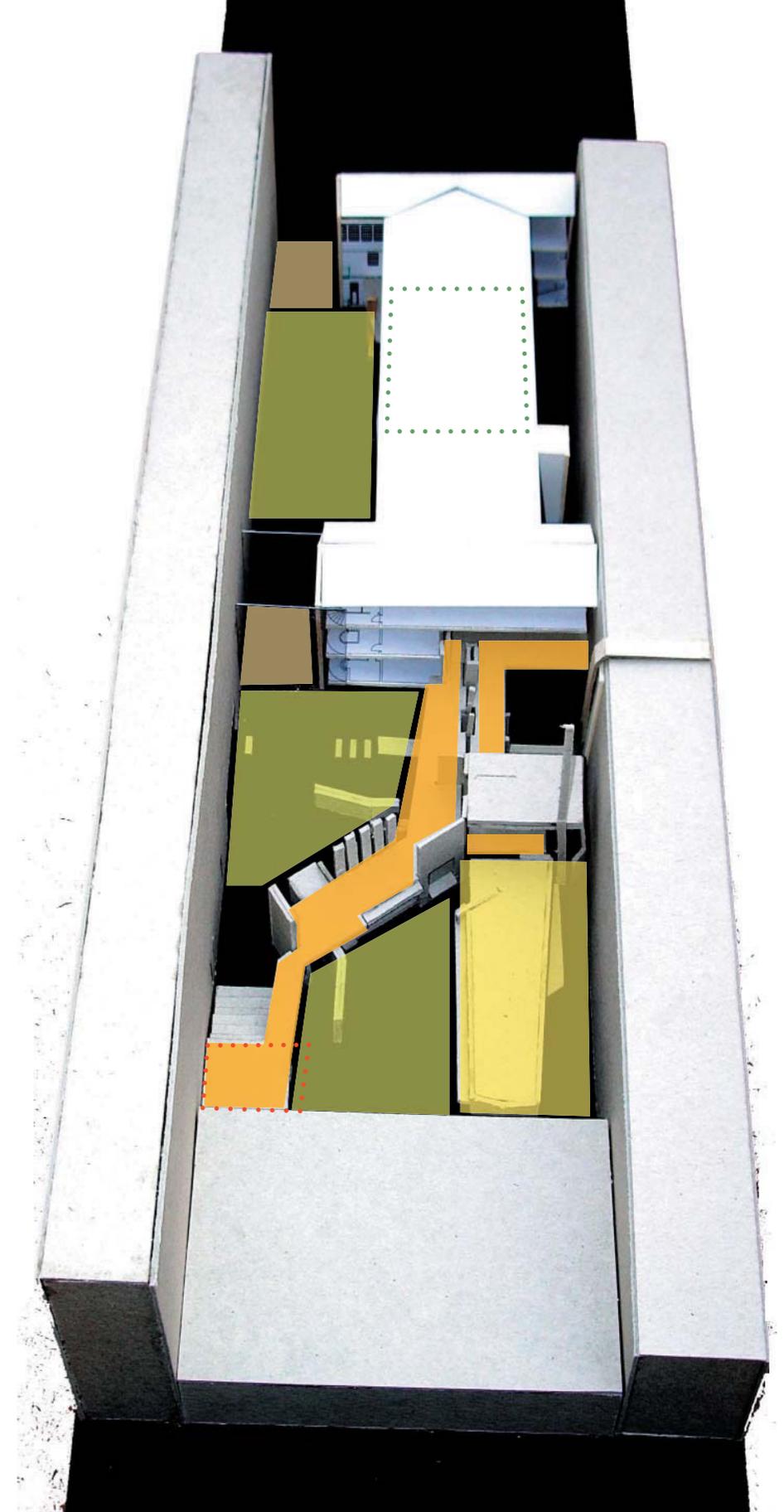
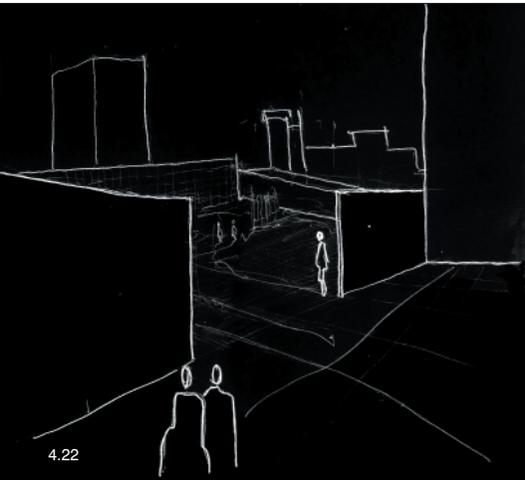


fig. 4.21. Model of programme massing

Experience of the designed spaces relies on movement and visual connection between them. A series of narrative journeys are used to illustrate the visiting experience.



4.22



4.23

A trip through the Noordvaal Thoroughfare, past Robbies Take-Aways and the hairdresser, takes the visitor to the middle of the arcade. The ten meter gap in the western wall of the arcade announces the entrance to the area, extending onto the red brick paving of a public area.

Following the brushed off-shutter concrete walkway, it diagonally divides the site into two halves. Behind the walkway, a prominent off-shutter concrete boundary wall defines the eastern boundary. The pedestrian opening in the concrete wall provides access to the adjacent parking garage.

A stepped terrace meets the visitor turning to the right, providing seating and overlooking the public area at the entrance. The tiered seating rises to meet the accessible walkway roof, extending north towards the existing building on the first floor. An inserted wall cuts through the existing floor slab, connecting the ground and first floor entrances through a narrow slit cut into the slab adjacent to the inserted wall. During the day the western side of the building is subtly lit by daylight flooding through the inserted glass staircase blocks.



A skeletal steel and cast concrete staircase rises inside the light boxes. A protruding landing extends past the southern glazed facade, connecting the visitor with the public area one level below. In-between the glass boxes, a more private courtyard is shaped through the insertion of the two spatial closures. Both open up into the courtyard on ground floor. The threshold between the courtyard and the existing building is defined by a series of stackable glass doors opening onto two wide concrete steps. A concrete ramp provides alternative access to the courtyard area. Three protruding windows on the southern facade are the only visible sign of the intervention in the MacFadyen Hall.

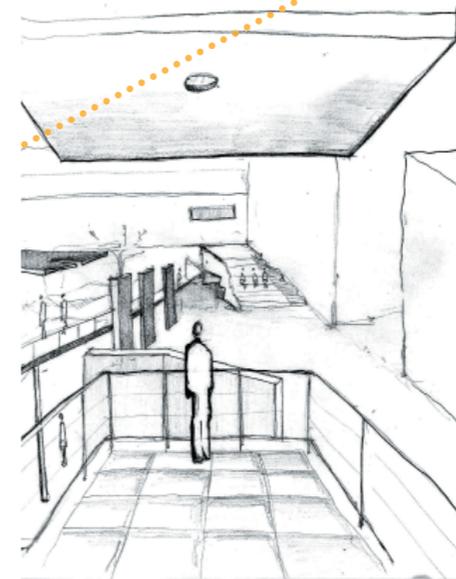


fig. 4.24. View from first floor balcony.

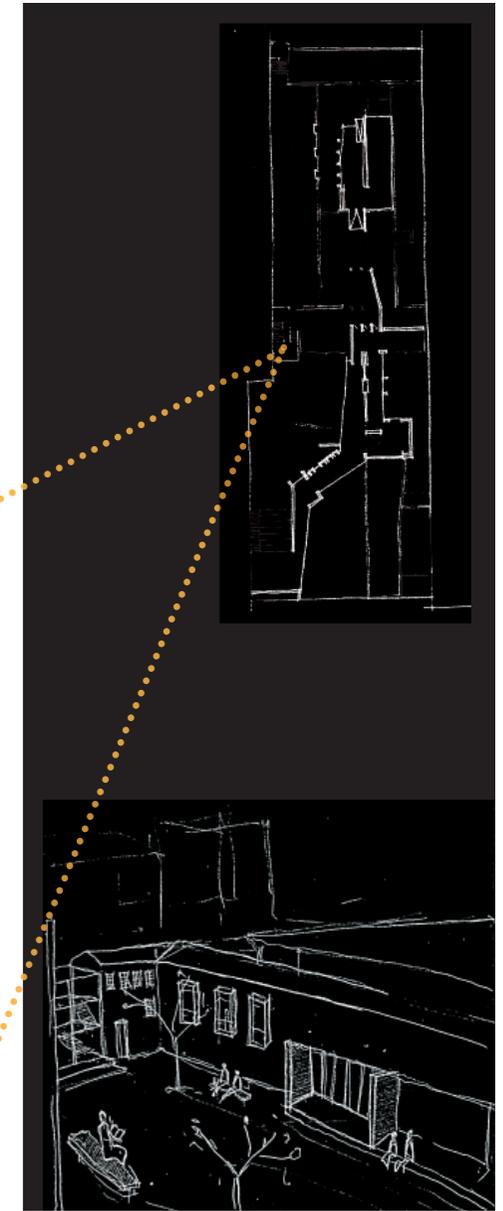


fig. 4.25. Library Courtyard.

Upon entering the Knowledge Room, the floor level rises with a raised timber floor to mark the circulation area. The level change slows the visitor down, creating the opportunity to engage with the activities in the room. In the morning, daylight floods through the eastern windows and is carried further into the area with white light reflecting fiberglass panels. A sequence of shaped polycarbonate screens in between the fiberglass panels lends a measure of intimacy to the room. A composition of elements structures the utility of the area to access the visitor in information retrieval. Visual connection to the library courtyard is through the protruding windows overlooking the area.

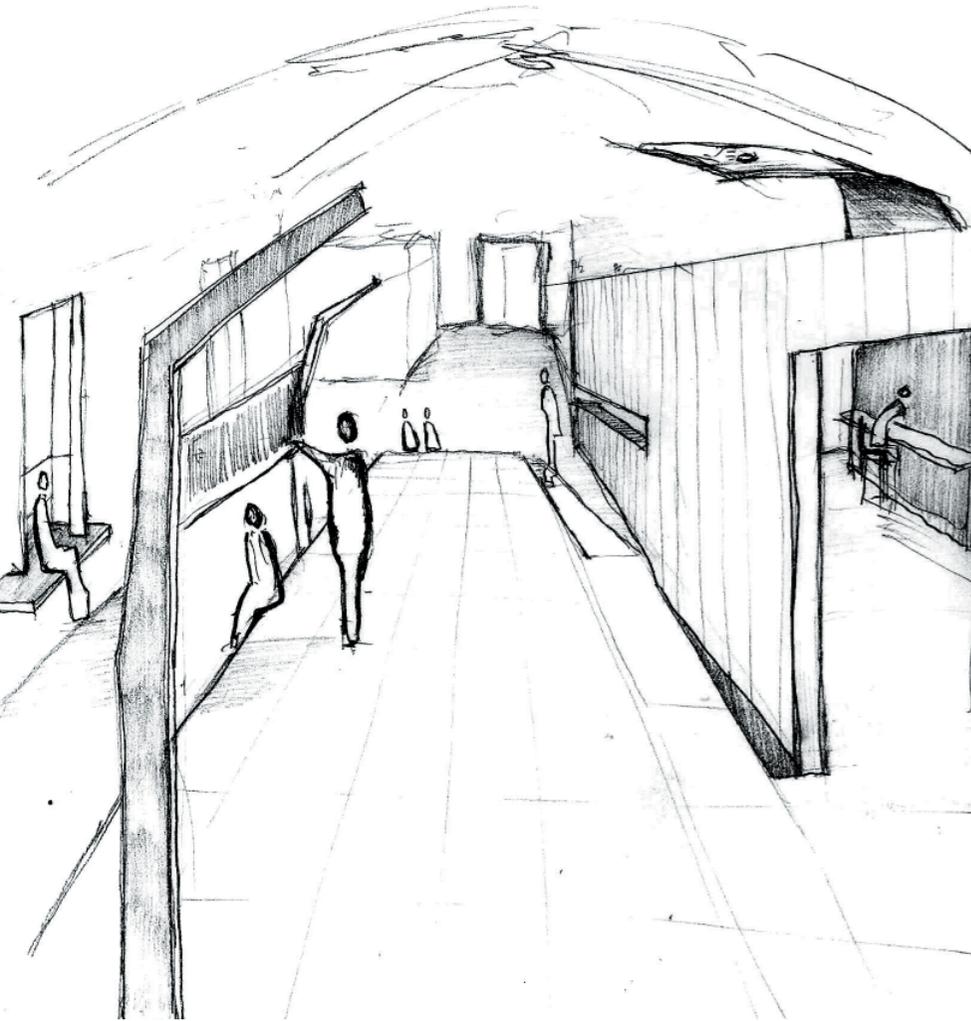


fig. 4.26. Interior view of the Knowledge Room.

Back to the entrance, a freestanding concrete wall curves away from the arcade entrance guiding the visitor to the raised floor of the walkway. The covered walkway serves as a connection spine into the site. To the right, a row of public telephones are fixed to red mosaic columns. On the other side of the walkway the line of sight continues towards an open courtyard, scattered with seats and shaded areas. Moving across the courtyard towards the concrete boundary wall, the floor level rises to a series of useable surfaces designated as café territory. A variety of small metal tables and chairs provide adequate seating during the lunch hour rush.

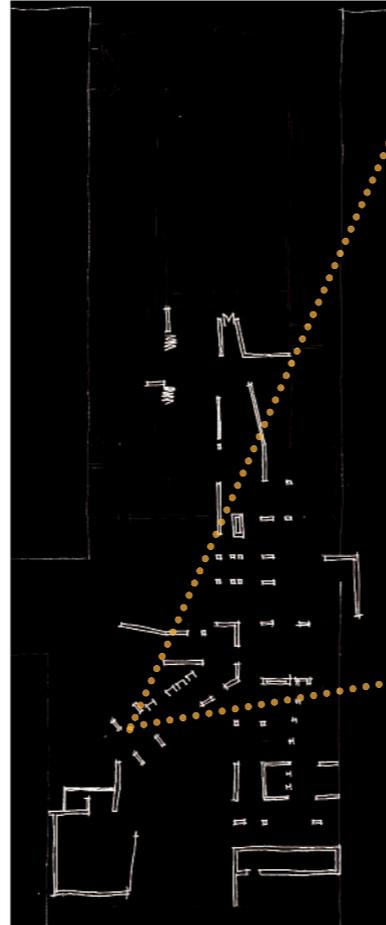


fig. 4.27. View of covered walkway and public phones.



4.28

Approaching the library from Vermeulen Street, the visitor's first impression is of a protruding off-shutter concrete block at the bottom of the inserted glass facade. Recessed cast lettering announces the public intervention in the existing building. The skeletal staircase hovering inside, is visible from street level. The glass facade becomes a showcase for activity inside.

Towards the entrance, a number of visitors occupy the concrete bench on the sidewalk. Three concrete steps lead the visitor into the building, with the staircase to the right and the southern intervention clearly visible through the main corridor stretching to the back of the building.

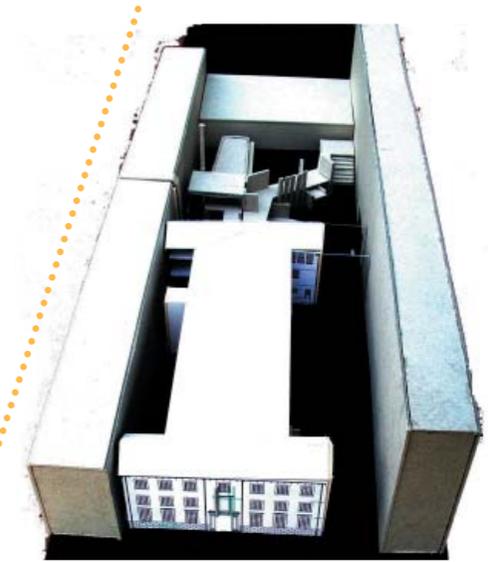


fig. 4.30. Concept Model of Vermeulen Street entrance.



4.29

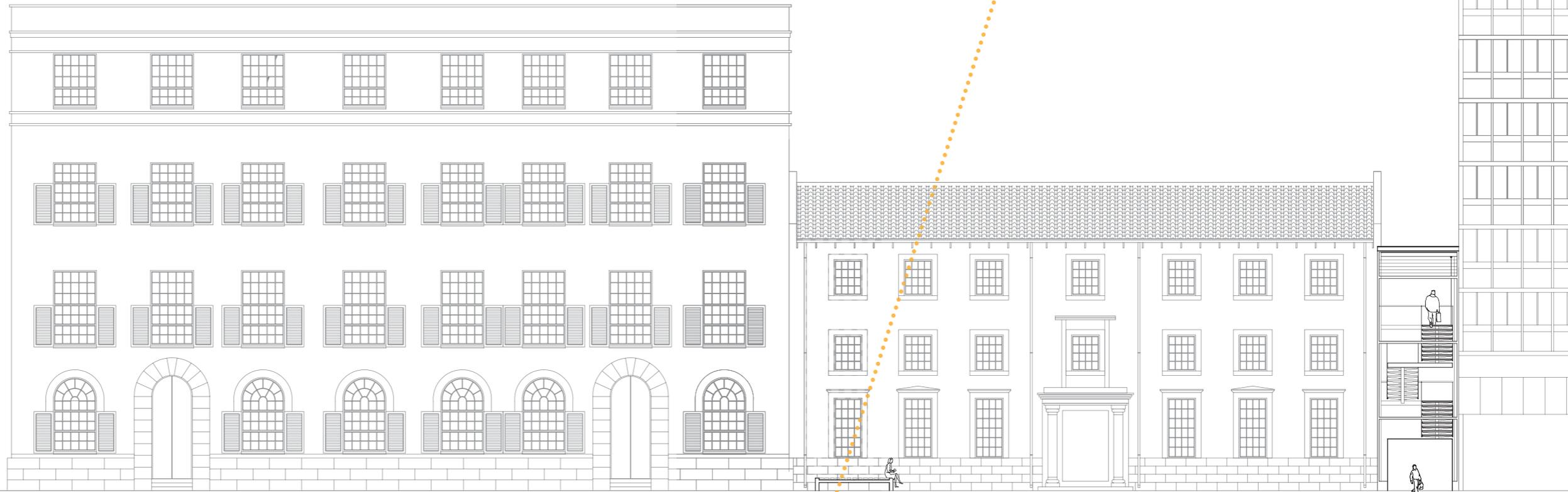
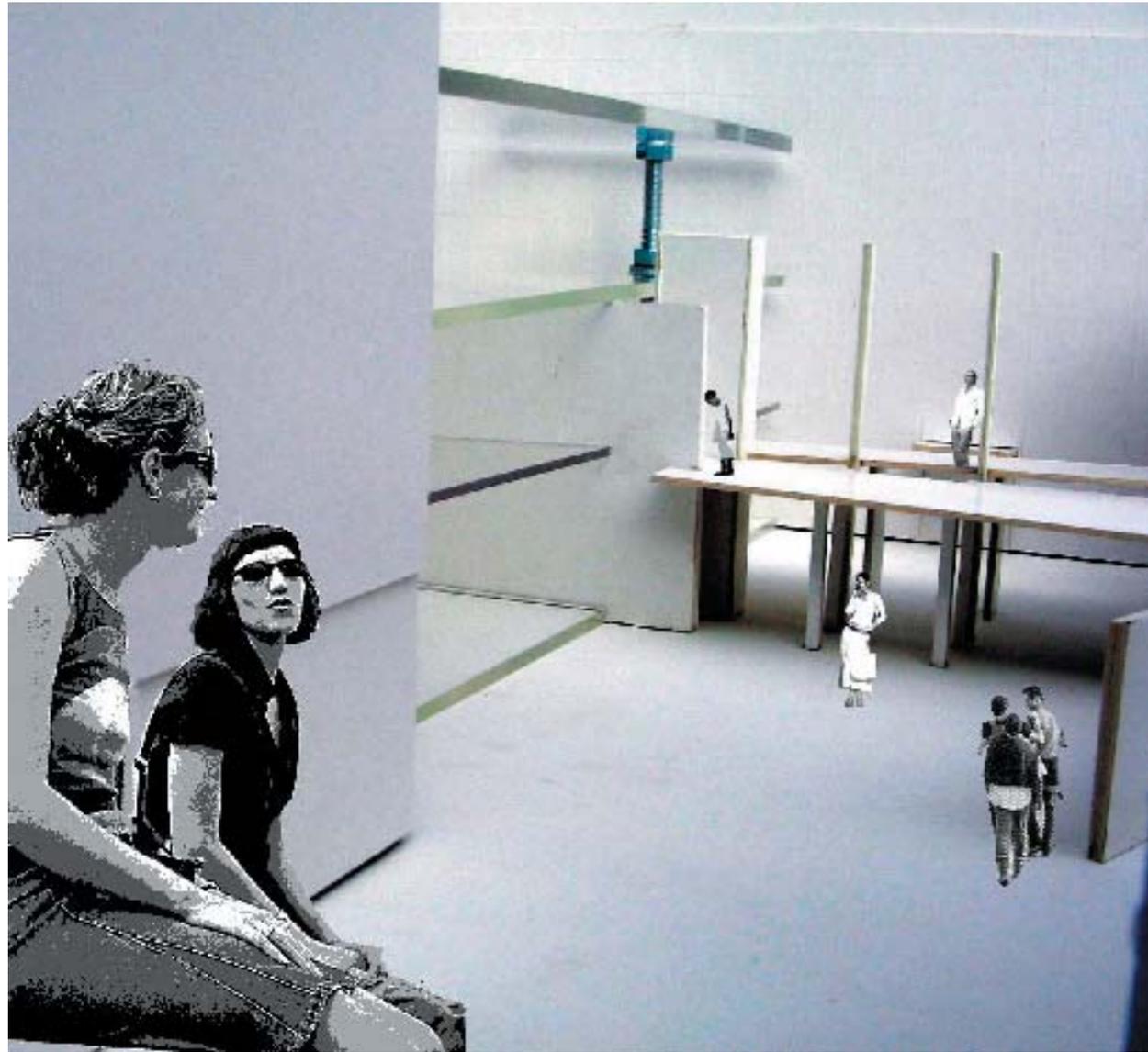


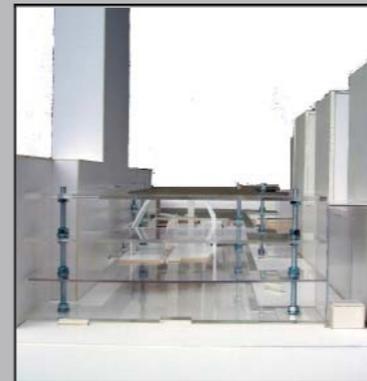
fig. 4.31. Vermeulen Street elevation.



perceive



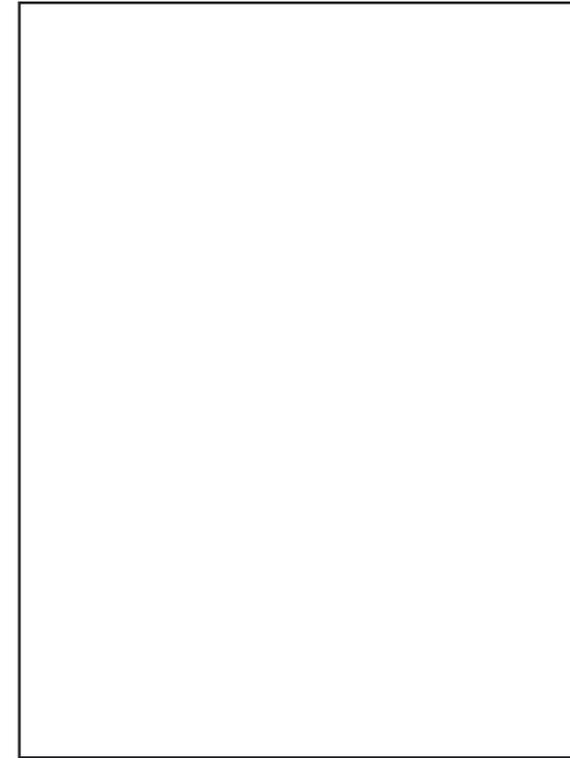
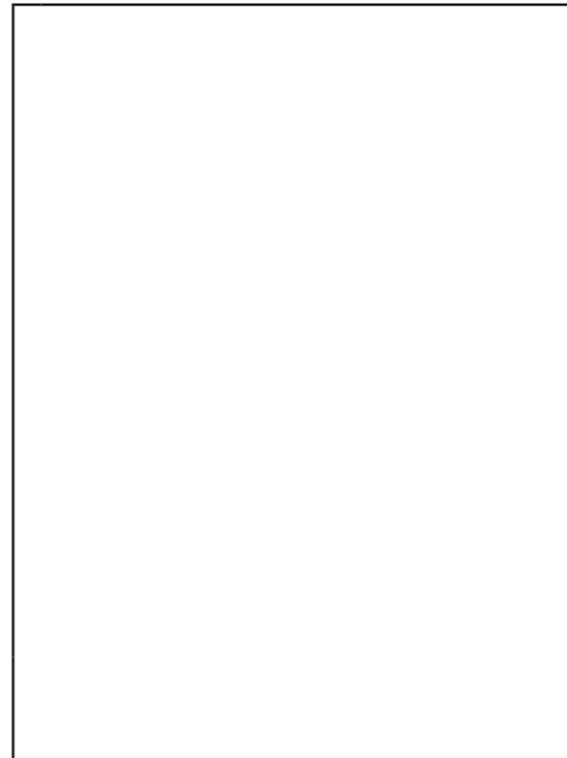
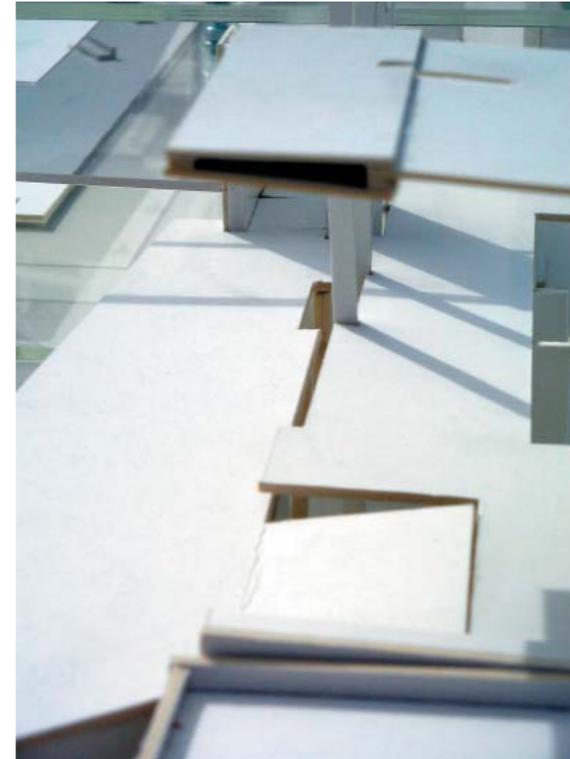
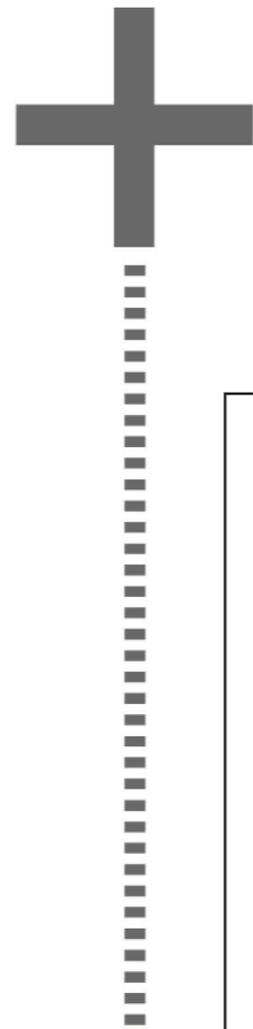
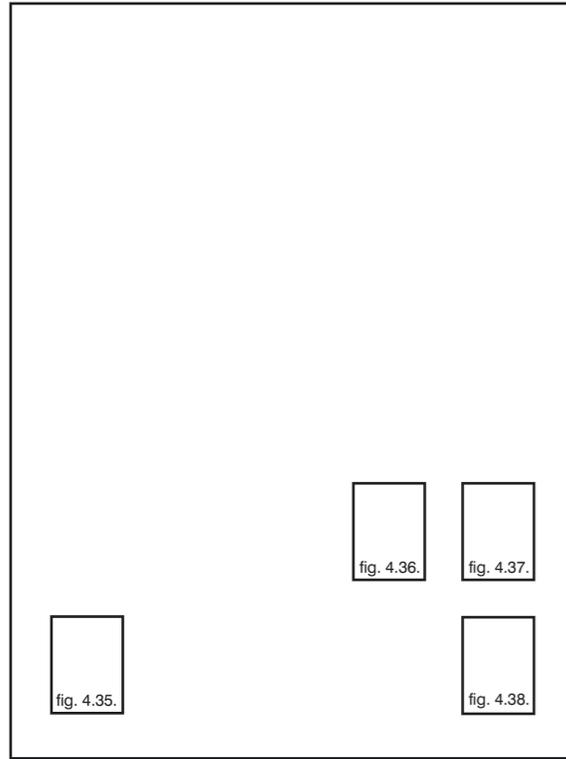
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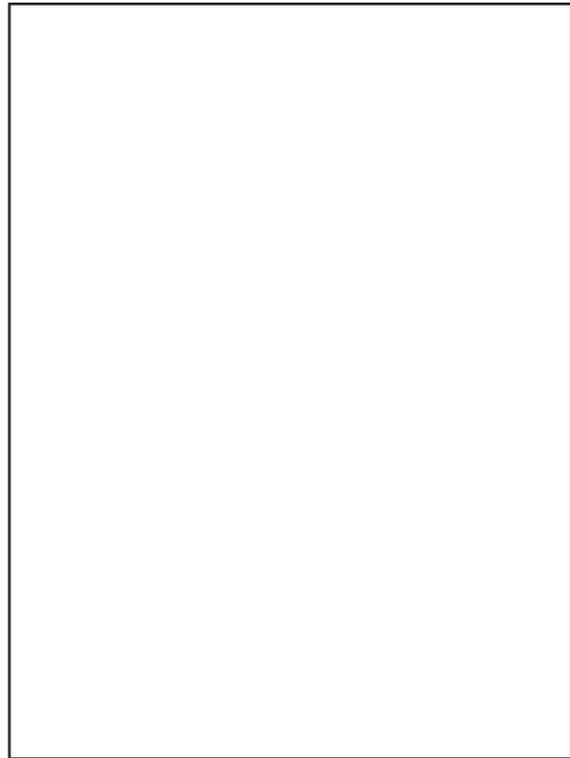
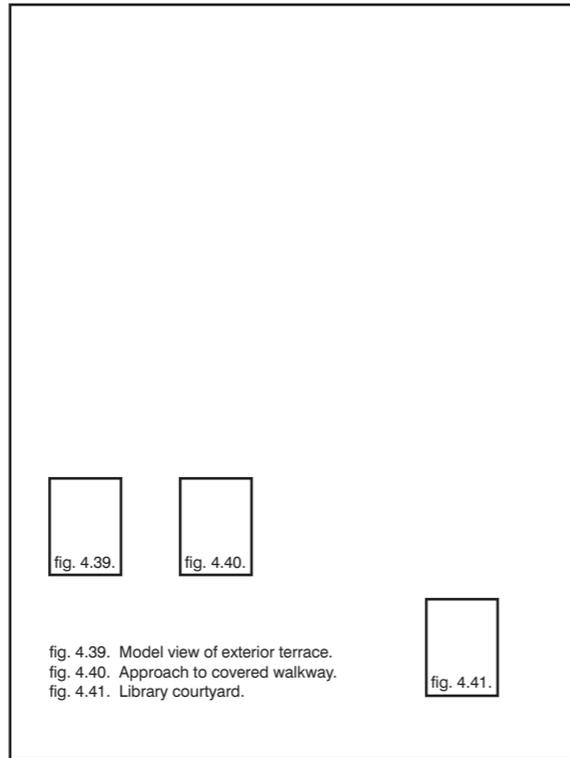
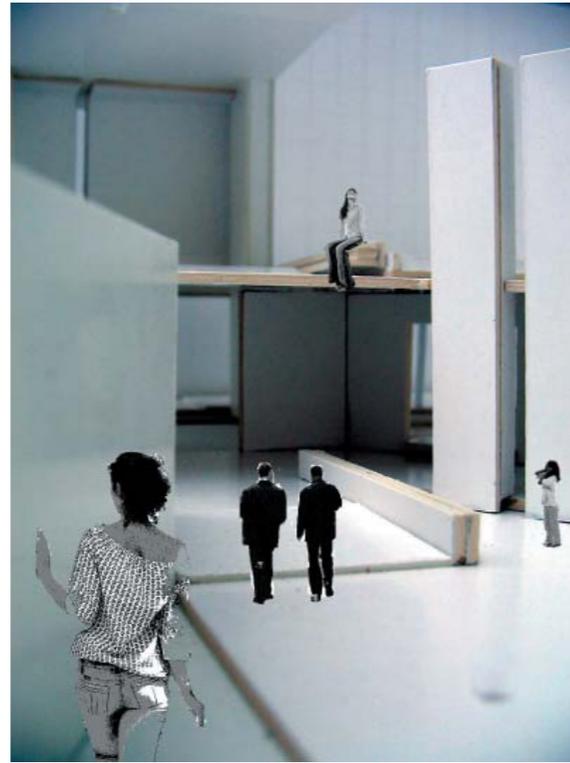


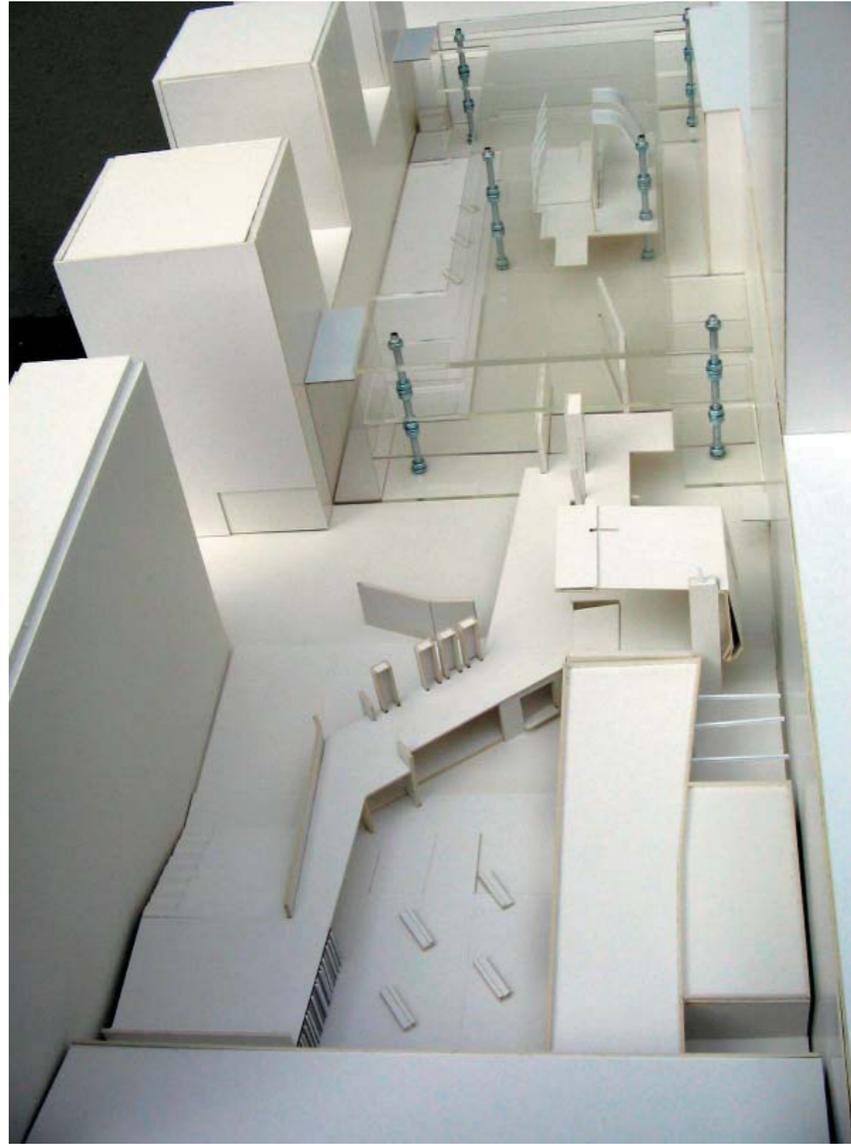
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4.34







4.42

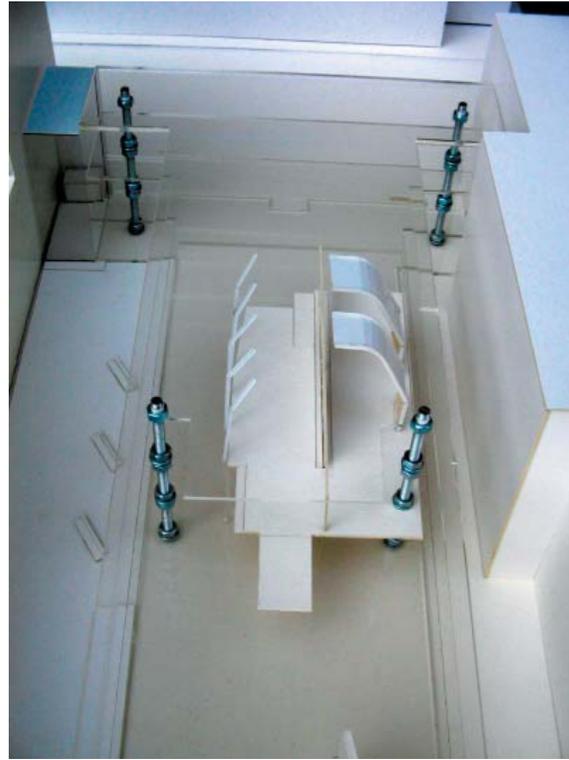


4.43



4.44

fig. 4.42. Perspective view of final model.
fig. 4.43. Approach from Vermeulen Street; final model.
fig. 4.44. Approach from Vermeulen Street; final model.



4.45

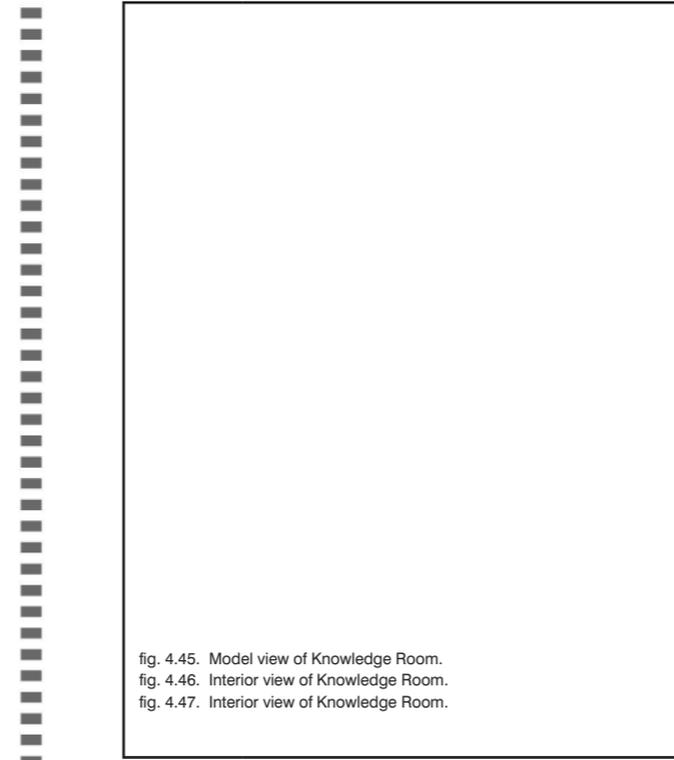
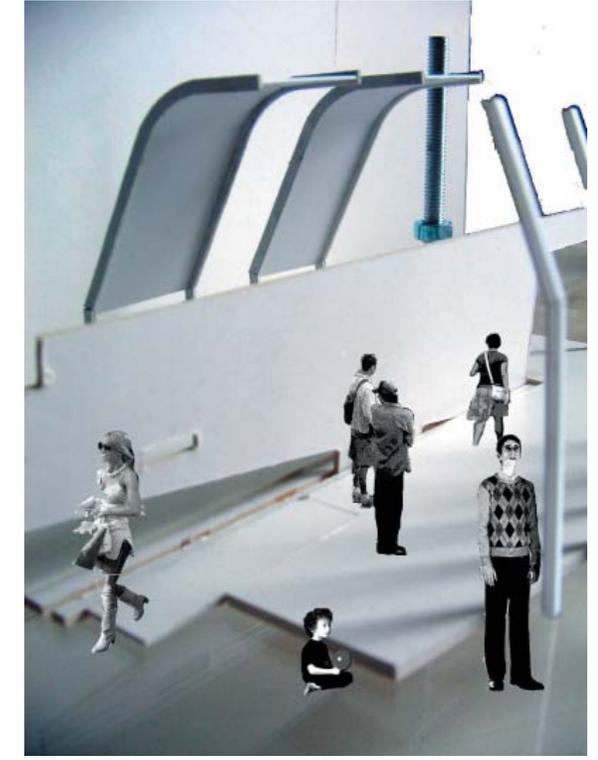


fig. 4.45. Model view of Knowledge Room.
fig. 4.46. Interior view of Knowledge Room.
fig. 4.47. Interior view of Knowledge Room.

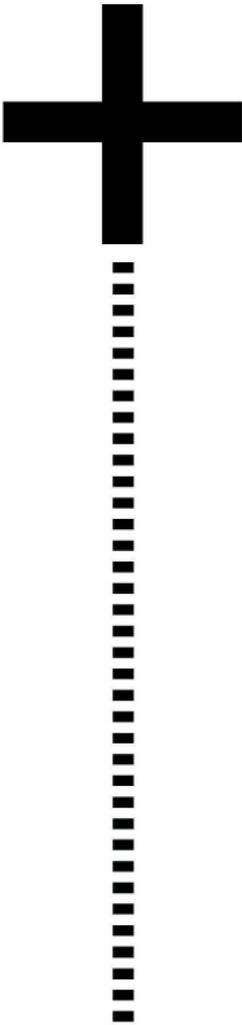


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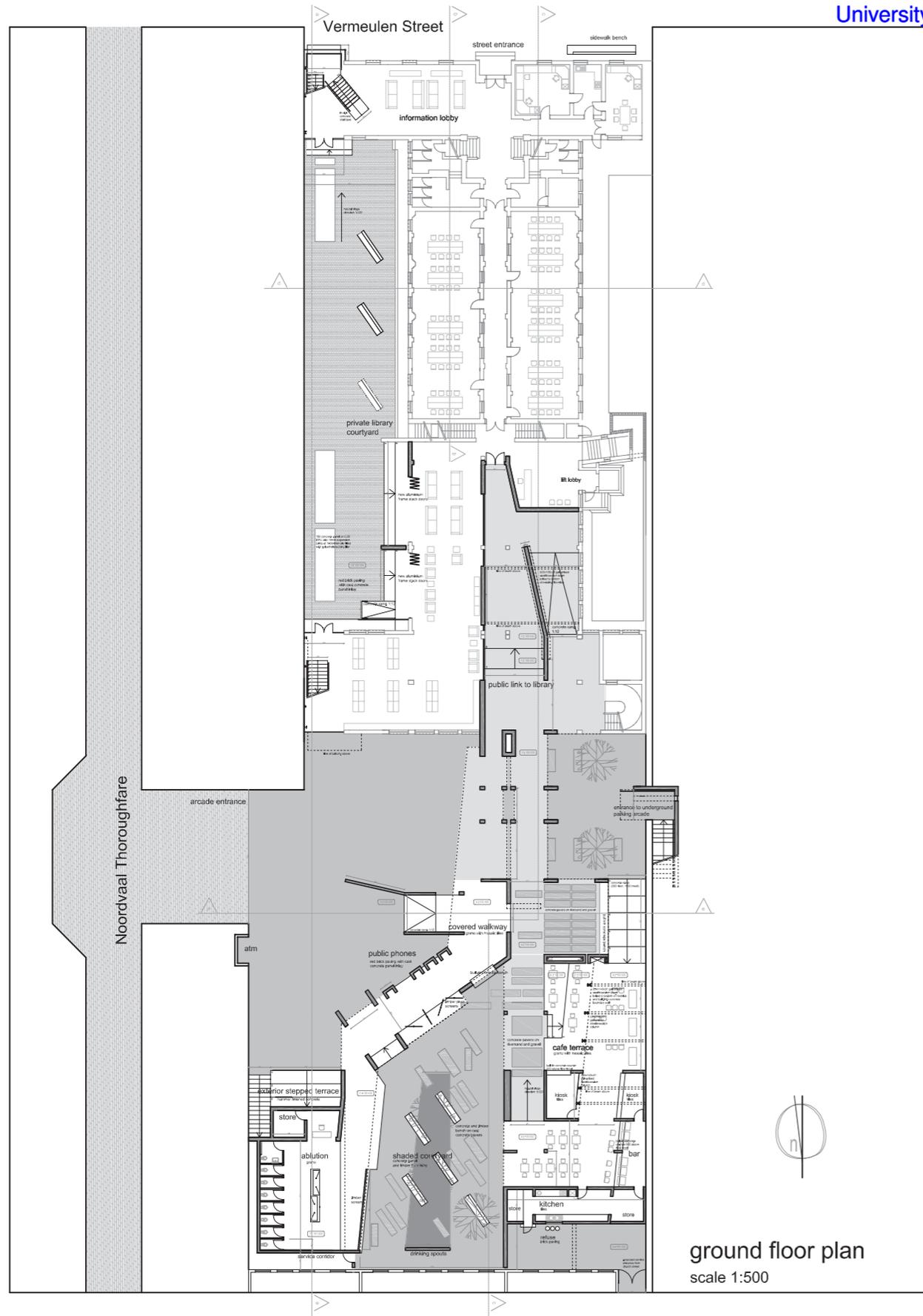


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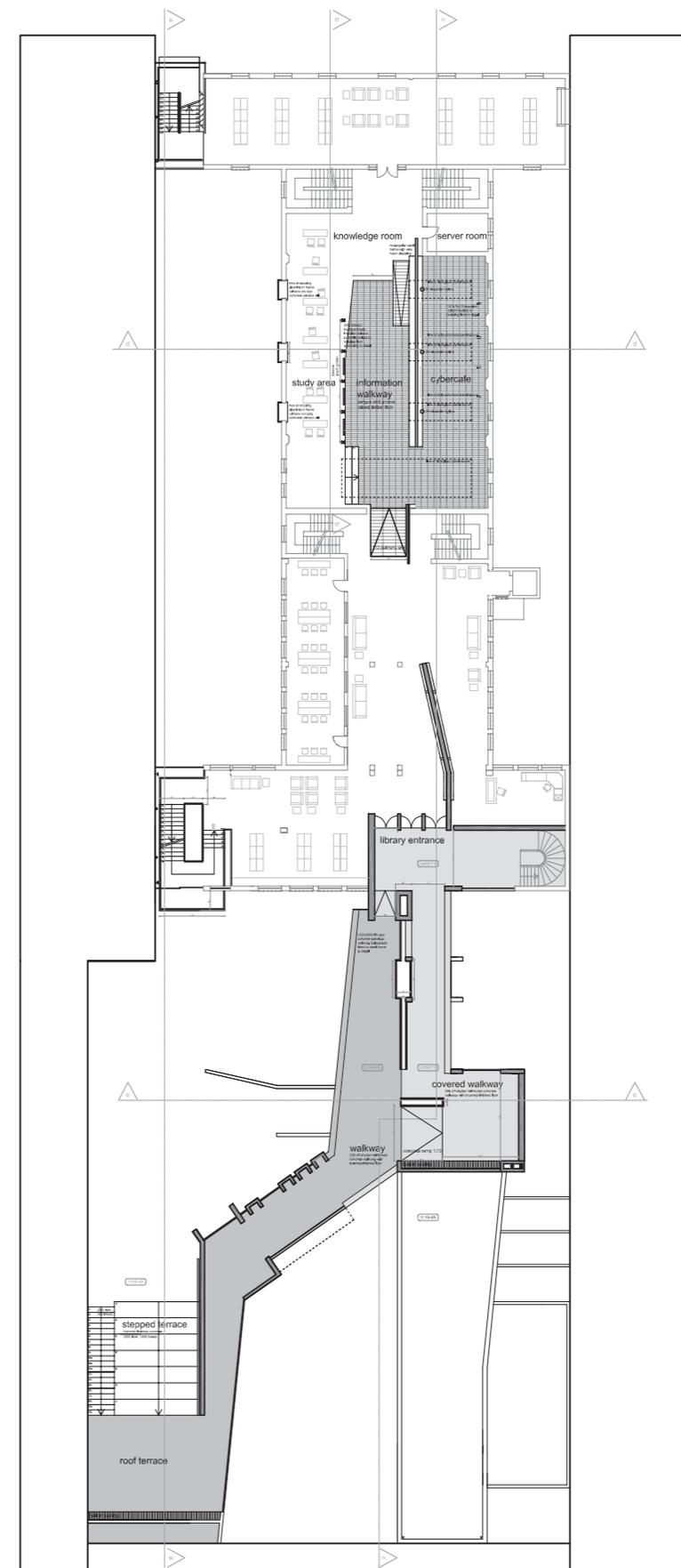




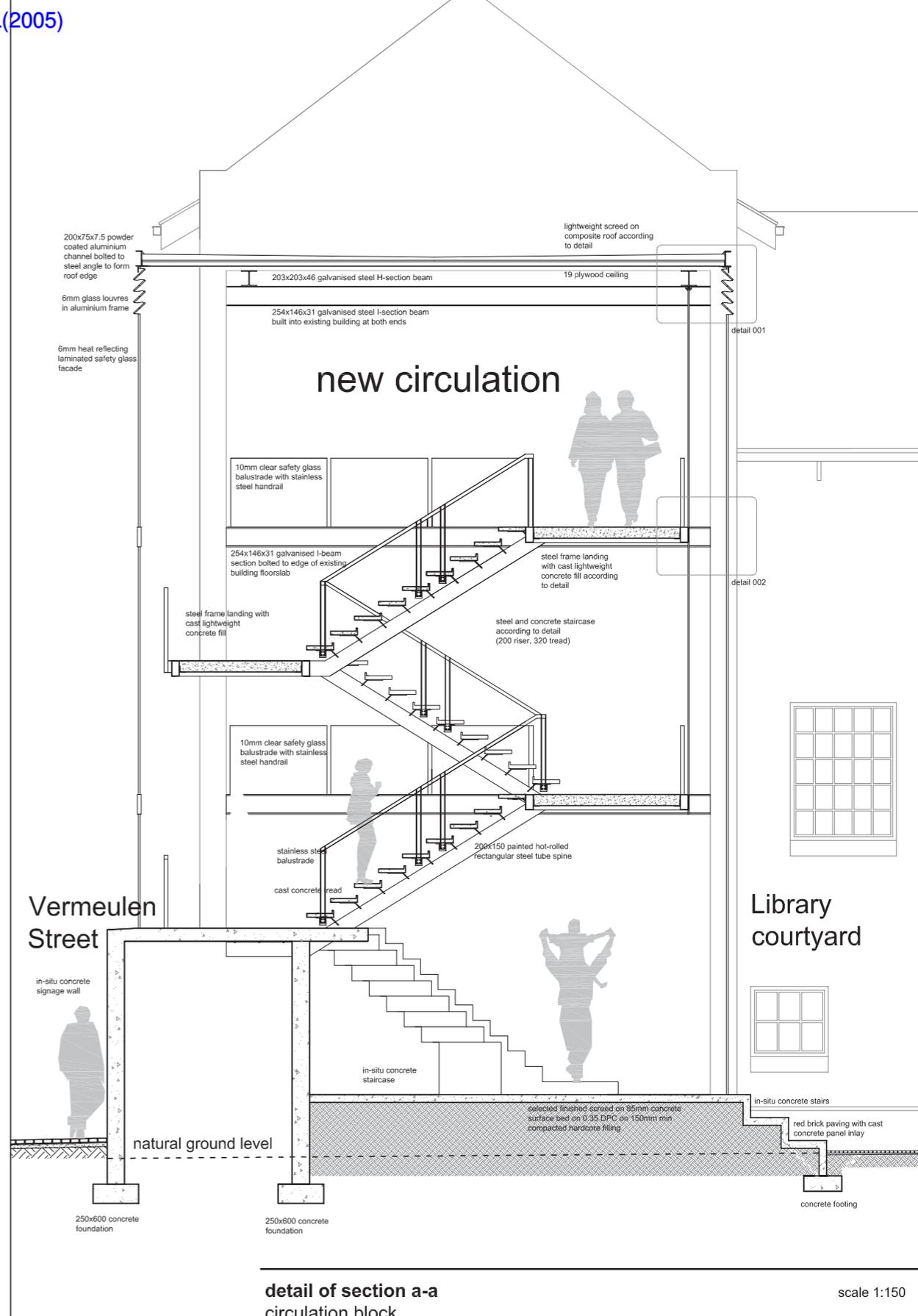
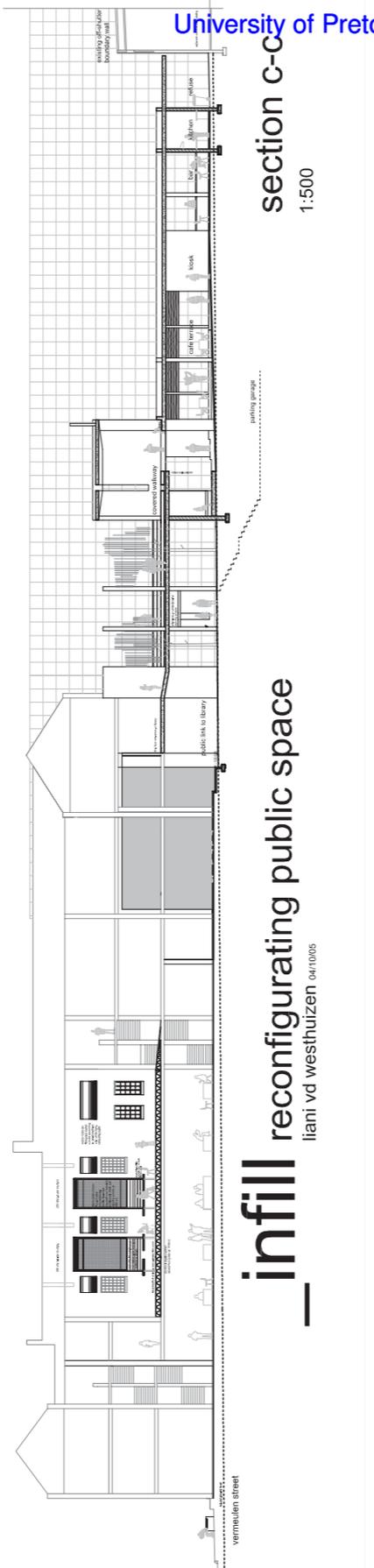
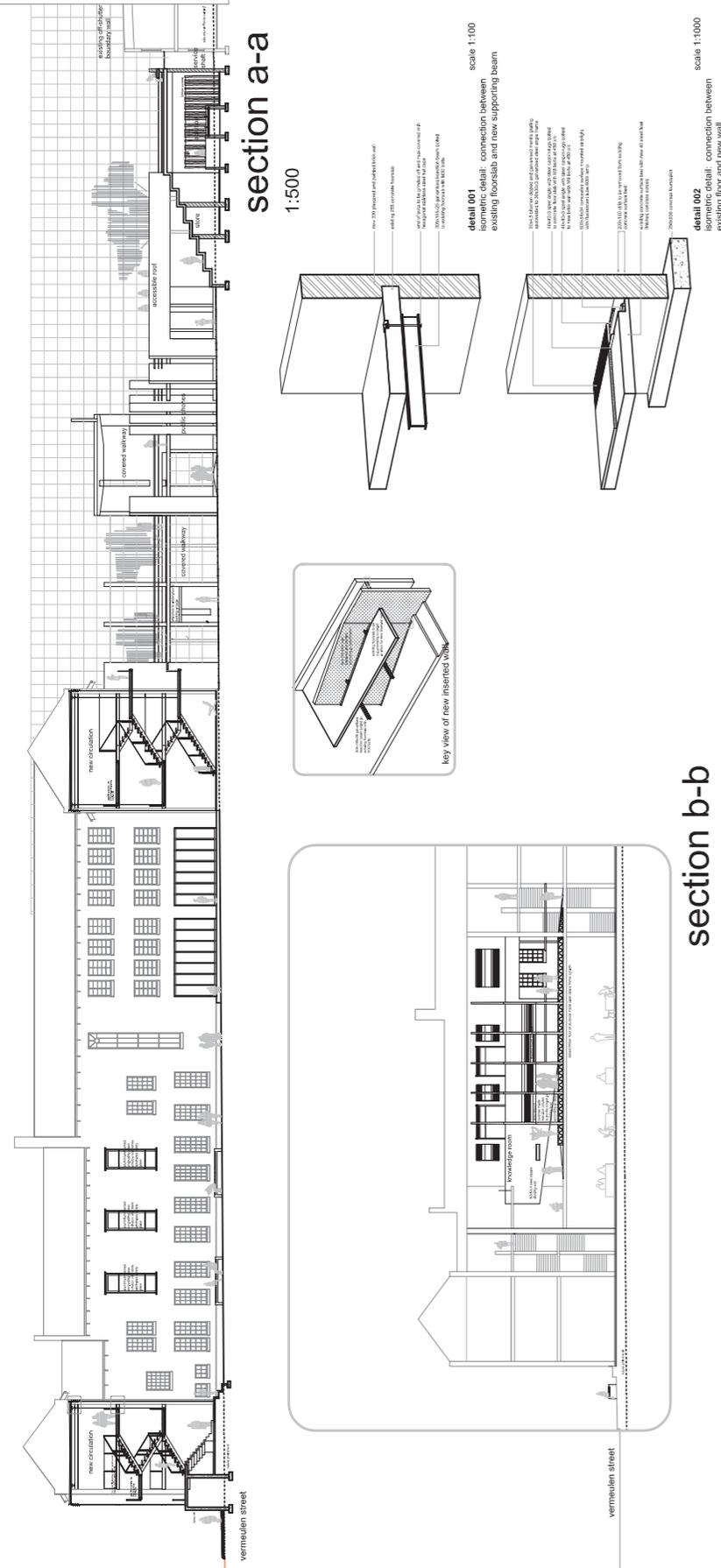
drawings

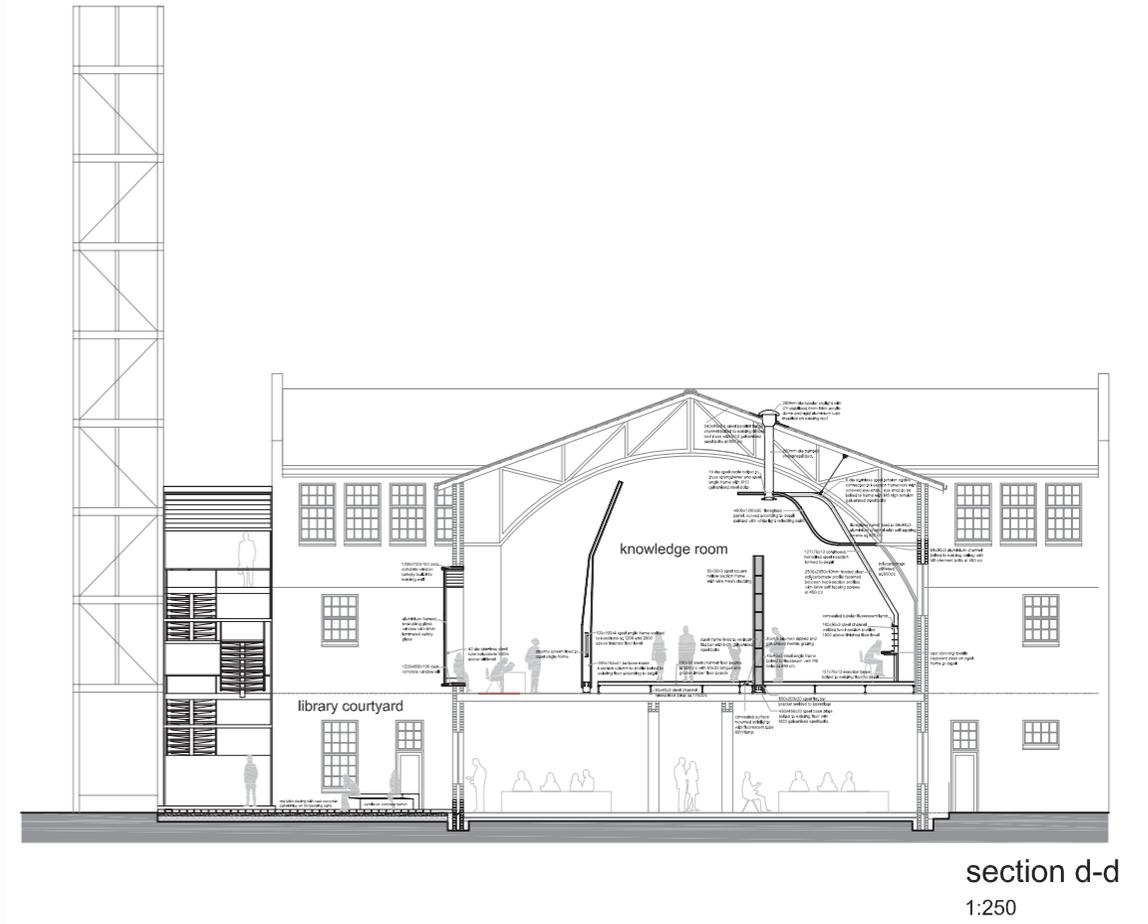
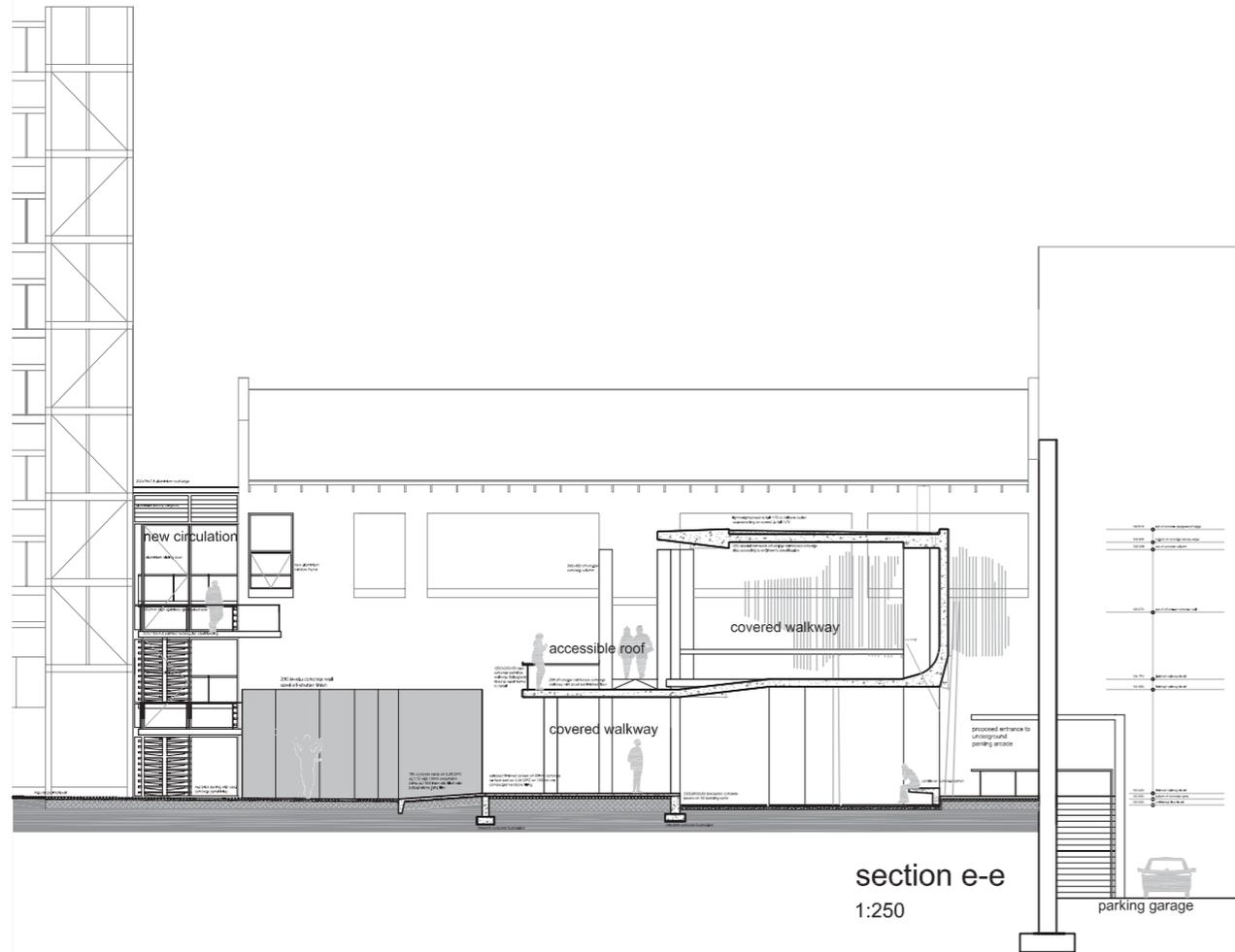


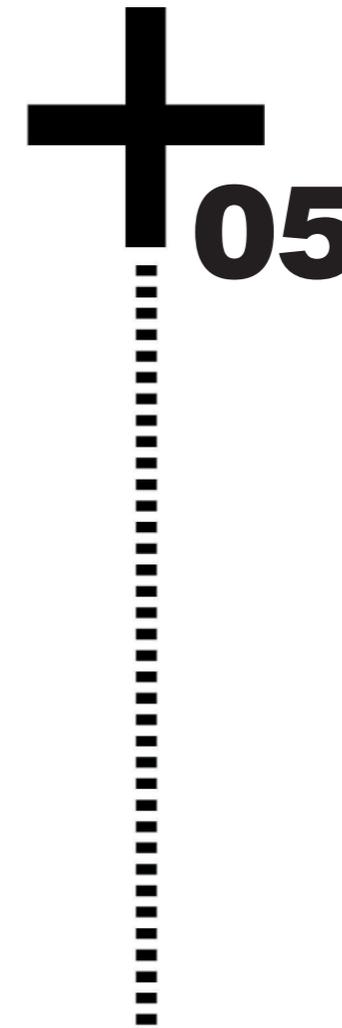
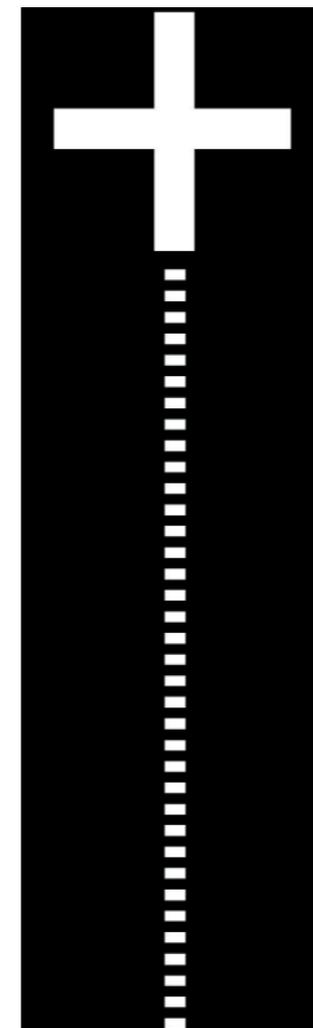
ground floor plan
scale 1:500



second floor plan
scale 1:500







detail

site

Position of the site demands interaction with the surrounding fabric. The design does not intend to replace the existing character, but to attribute to it by adding layers of intervention and meaning to it. The design aims to integrate the Brownfield site into the existing fabric of Vermeulen and Church Street. Of further importance is the 2,5m slope of the site from south to north over a distance of 140m. Infill building components are terraced, following the rise of the terrain towards the southern boundary. All levels are accessible to all abilities.

services

Stormwater runoff to follow the natural slope of the site. Stormwater is dispatched of by storm water channels on various levels on the site. The stormwater channels connect to the municipal stormwater in Vermeulen street. Water runoff on hard surfaces of the open public courtyards to flow to nearest covered drain to connect to municipal services.

All main municipal services run along Vermeulen Street. All new services to connect to municipal connection. Building services in the existing library building will be used in the functioning parts of the building. Service corridor for public ablution facility to be covered with mentis grating panels.

Municipal access for the collection of refuse and services is through the proposed service entrance on the southern site boundary through Church Street. Service corridor also used for bar and kiosk deliveries.

security

Access to the area is possible from three entrances. The main entrance being the new connection with the Noordvaal Thoroughfare, with the existing street entrance through the library building acting as a secondary entrance. The proposed entrance to the underground parking basement on the eastern boundary provides an alternative route in case of emergency. After hours access to be controlled at the entrance connection of the Thoroughfare. Possible after hours closure of the entrance connection to the Thoroughfare to be considered. The Knowledge Room will feature a pass through sensor arrangement, preventing the unauthorized removal of library material.

public space

The creation of a successful public space relies on a dynamic set of connections rather than one destination. The intervention creates connections between the street, arcade, parking garage and existing building. Public space plays a role as a catalyst for urban regeneration and development, by improving the quality of civic life, and has the capacity to be the container of as many aspects of community life as possible. The design should promote the freedom for people to choose how to inhabit or interpret the place within certain constraints.



fig. 5.01. Concept sketch of entrance to underground parking arcade



landscaping

To accommodate many varied activities, a range of different kinds of space are necessary, with differing degrees of shelter: roofed, shaded by trees or open to the sky; with differing degrees of enclosure and connection; with differing surfaces.

The proposition is that if edges, level changes, sheltering elements paving patterns, trees – all the components of exterior space- are organised to make subtle differentiations and dimensioned for various sizes of groups, they will invite people to inhabit them in various ways (Cooke 2005:33).

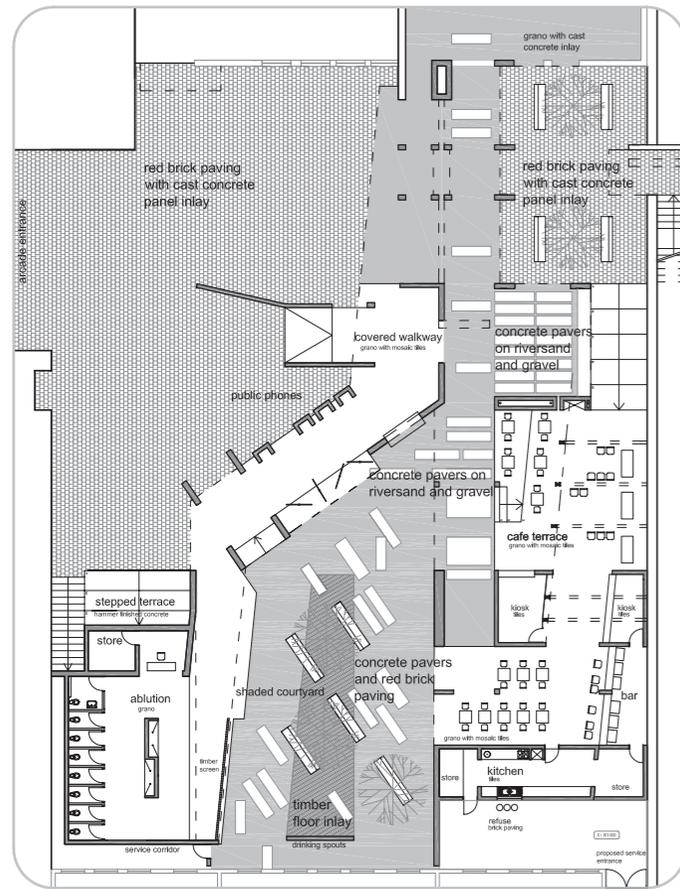


fig. 5.03. Detail plan indicating exterior floor surfaces. Not to scale.

EXTERIOR FLOOR SURFACES

Floor surfaces are used to indicate the different areas and movement routes through the area. Red brick paving continues from the arcade floor surface into the site. Paving is laid in stack bond, suggesting the direction and rhythm of movement.

From the arcade the primary view of the brick pattern should occur perpendicular to the brick course. Alternative surface includes cast concrete panels either on gravel or inbetween paved areas.

The centre of the shaded courtyard is differentiated by a broad timber deck strip, laid in a herringbone pattern.

LIGHTING

Exterior lighting provides a sense of security at night, and therefore improves the quality and use of the area. The objective is to provide a general level of illumination over the central areas, local lighting to task specific areas and lighting at a low level, illuminating walkways for easy route recognition.

DRINKING SPOUTS

Wall mounted stainless steel spouts provide drinking water. Valves are manually operated. Mentis grid to cover the overflow drain for excess water.

LITTER BINS

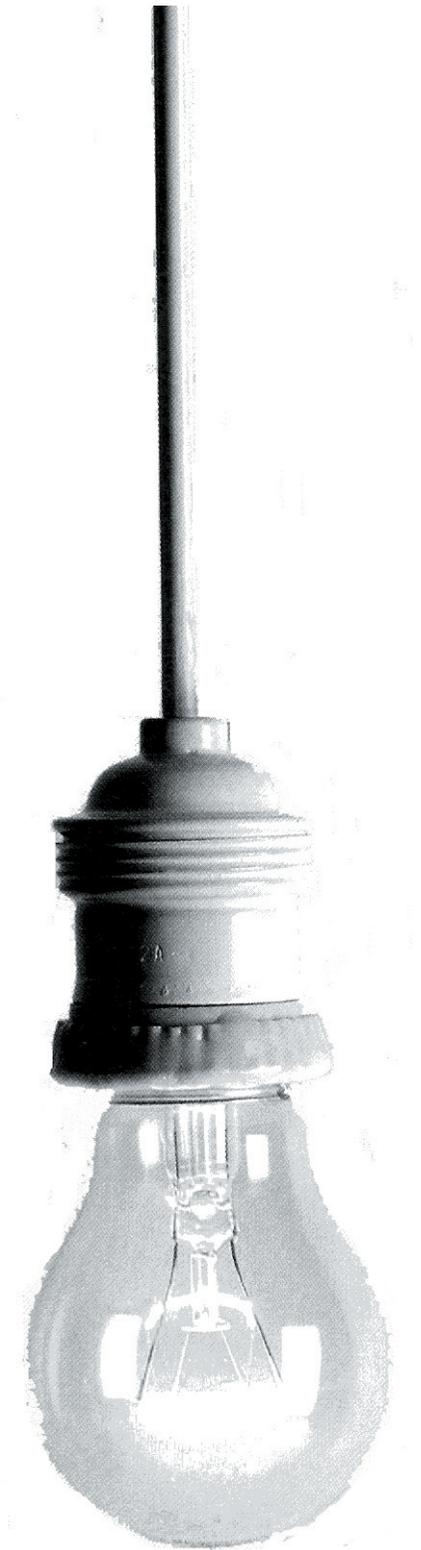
Litter bins need to be conveniently positioned close to where people sit and move, and also be immediately obvious. Bins are sited in recessed walls, to avoid obstruction, and constructed with a fixed outer concrete casing, together with an inner, corrosion resistant, lockable but removable, perforated sheet metal lining for emptying.

VEGETATION

Mature Celtis Africana (white stinkhout) trees will provide adequate shade during summer. Its deciduous nature will present the area with a differing character every season, and allow for ample sun spots during winter.

MAINTENANCE

The use of low maintenance, durable materials lowers the running cost and physical labour maintaining the area. Minimal painted exterior surface, and the use of raw materials reduce maintenance costs.





the habitable space between things

The art of architecture is not only to make beautiful things – nor is it only to make useful things, it is to do both at once. Hertzberger (1991:176) calls it 'inviting form', describing architecture which is not only accommodating but also stimulating.

Design of public places should be more useful, more applicable and suited to more purposes. The objective is to increase a space's accommodating potential, thus making it more receptive to different situations. The habitable space between things represents a shift in attention from the official level to the informal, to where ordinary day-to-day lives are led (Hertzberger 1991:188).

Response: Level differences are consciously exploited to provide seating. Parapet walls are broadened to provide somewhere to pause, lean against or to sit on.



5.06



5.07

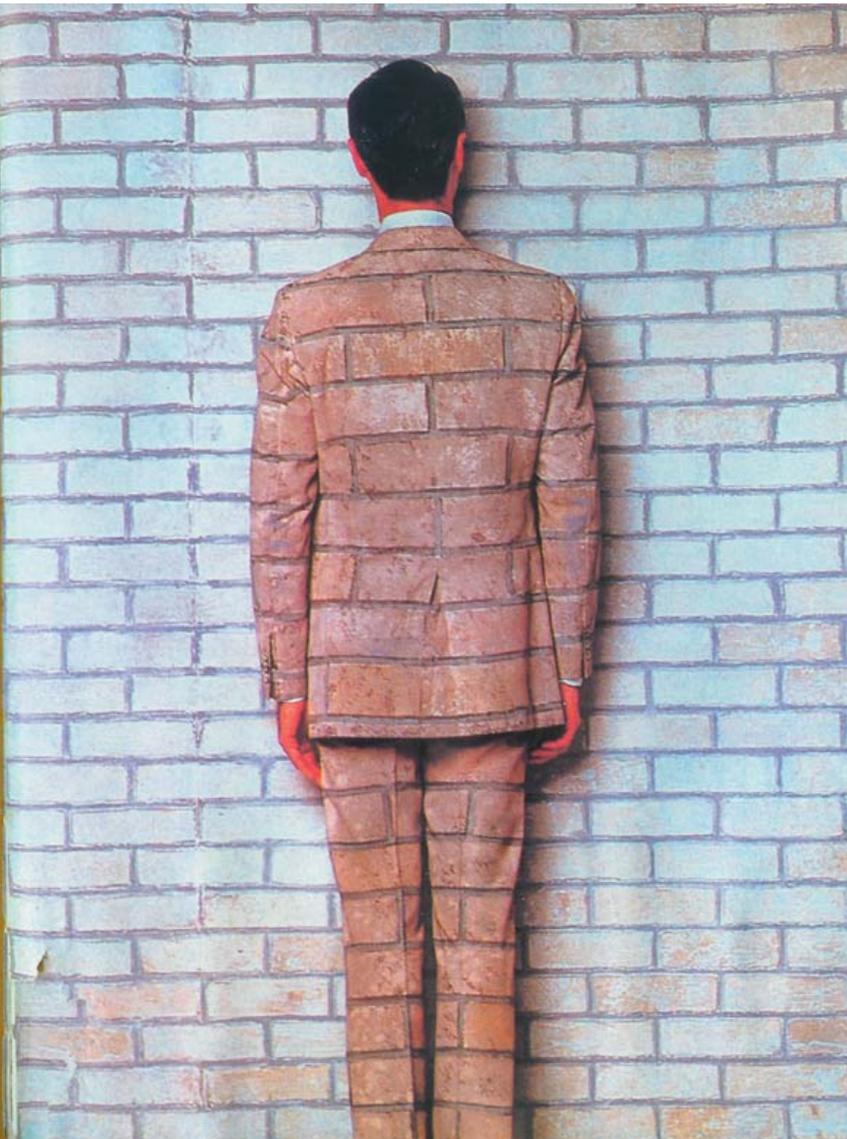


5.08

fig. 5.06. Timber bench.
fig. 5.07. Structure as seating.
fig. 5.08. Bollard seating.



materiality



Sustainable public places need to be robust enough to endure environmental and human impact. Material quality of the intervention is intended to be created over time. Similar to the surroundings, the space will become a patchwork of cultures and materials, and will gain a patina that allows it to sustain and be homogenous with the adjacent urban fabric.

Materials are selected for tactility, durability and strength. Signs of vandalism are regularly noticed in public areas. The objective is to create a robust area for human activity, discouraging damage to it.

In-situ concrete is used as a structural, sculptural and landscape element. All concrete walls are high finished off-shutter with varying finishes. Movement routes are constructed from 30 MPa reinforced concrete and sand-blasted to reveal the aggregate and aid in slip resistance of the walkways. Exterior steps are hammered finished. All concrete surfaces to have expansion joints at 1500mm intervals, filled with polyethylene joint filler.

A third neutral material acts as a transition between contrasting materials, and different floor surfaces should therefore be separated with a stainless steel strip. Interior floor surfaces are finished with 25mm concrete screed tinted and finished with a layer of 6mm clear epoxy. Cast concrete pavers in different sizes are used in paved areas in-between either red brick paving or gravel.

All glass used are 6mm laminated safety glass. The component is strong and fire proof. Aluminium window frames lower maintenance, and prevent corrosion.

Doors are manufactured of hardwood, and varnished. Ablution cubicle doors have self-closing door hinges. All fixings are non-removable and made of galvanized steel or stainless steel.

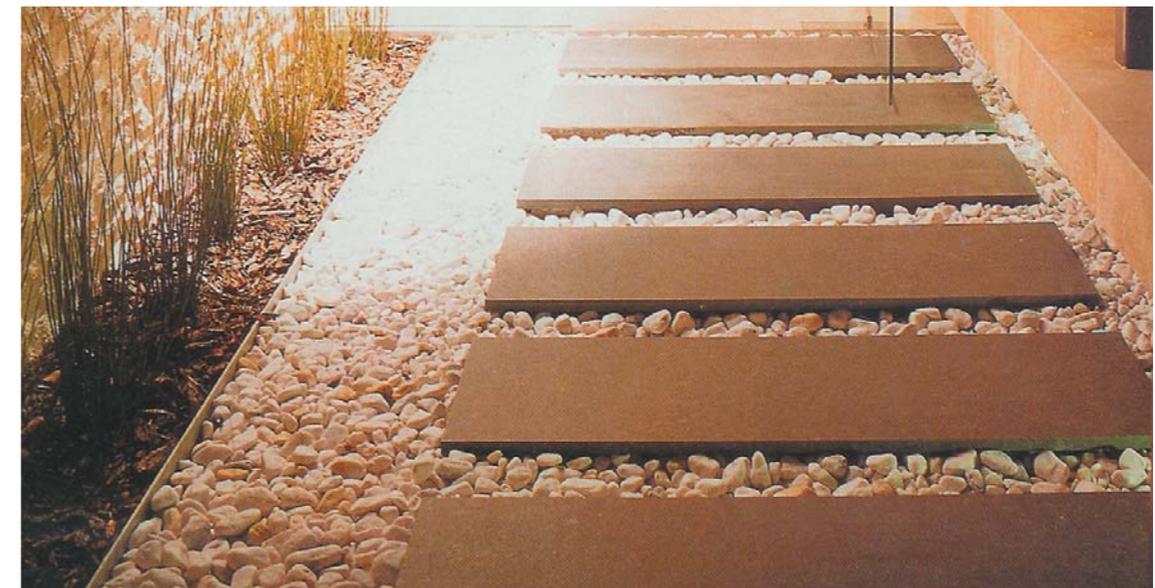


fig. 5.10. Cast concrete pavers on gravel

construction

Construction becomes lighter and connections more visible and exposed as the intervention fills the urban gap and punches through the existing building towards Vermeulen Street. The intervention in the gap (described as infill), is perceived as a solid infill inbetween the existing boundary walls. Mass is asserted by concrete columns, thick off-shutter walls and brushed concrete walkways. Tectonic mass reduces by introducing steel elements as the structure enters the existing building. The intervention in the existing adds another material layer to the present. Added elements of the intervention should not be perceived as existing. All new elements and their connections are announced. Either through a gap, division of materials, visible fastening methods or lighting.



fig. 5.11. Concept model

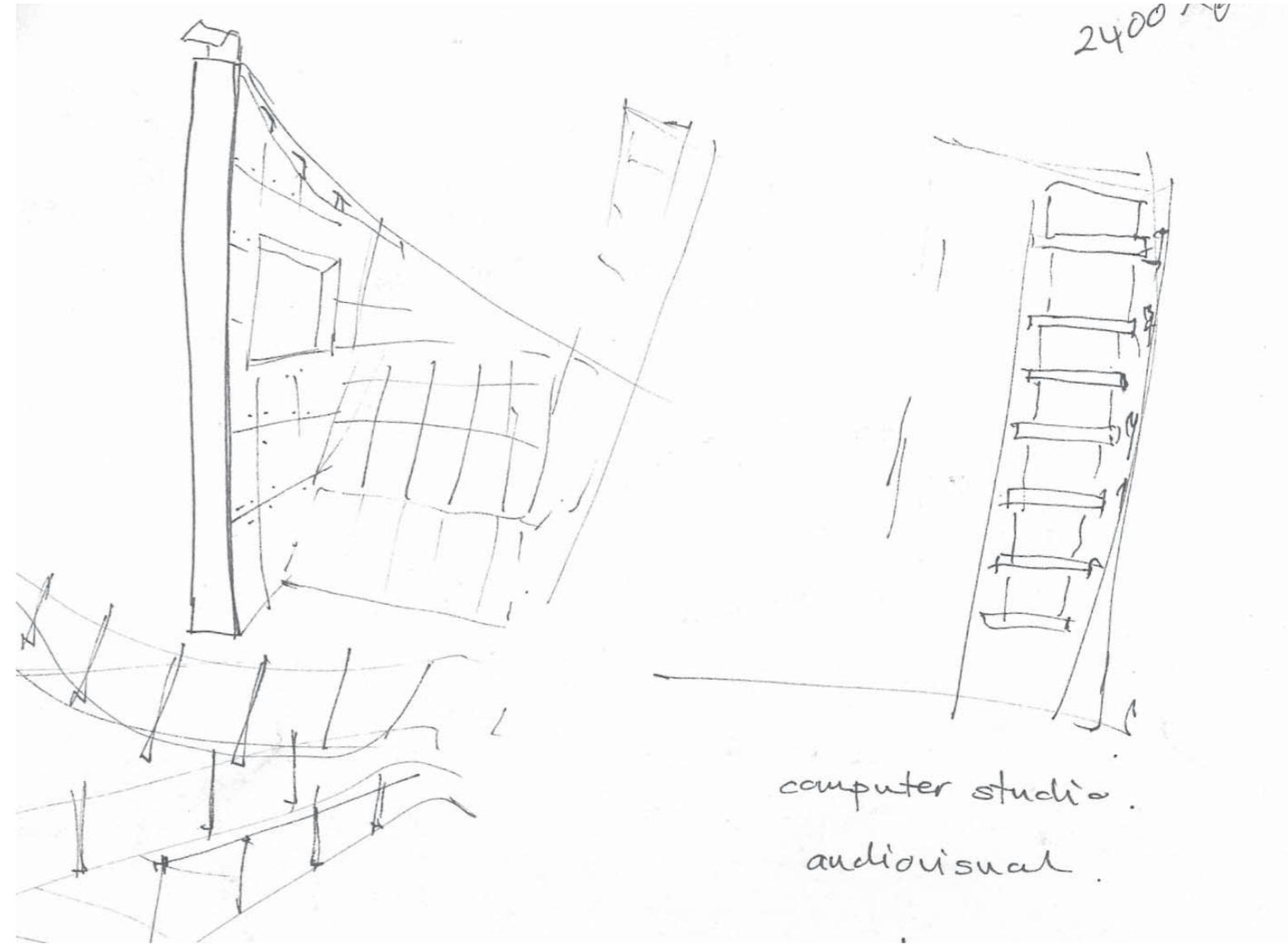


fig. 5.12. Concept sketches of lighter, tactile interior construction

connections

By showing how things work, and letting each element speak for itself as far as its function in the larger whole is concerned, the architecture of a building can intensify one's awareness of the phenomena that make up our environment. The expression of construction gives interdependence to the component parts. A shift of emphasis occurs from the objects themselves to what connects them, to their interrelationships. The connections of new elements with existing fabric are designed in such a manner.

INSERTED BRICK WALL IN THE PUBLIC LINK TO THE LIBRARY

The existing first floor slab is cut 200mm either side of the protruding wall. Structural support is added through a steel I-section beam bolted to the existing floor slab. Beam to end 300mm before the supporting wall, accentuating the addition. Line of insertion is repeated at the base of the new wall with a 200x150mm parallel strip removed of the existing floor, and covered with a metal grid infill and lit from below.

INSERTED STEEL COLUMNS

All new steel columns to be fastened to steel angle supports to end 200mm above finished floor level. Base plates to be exposed and fastened on top of finished floor level.

FLOOR FINISH

All new concrete screed and floor finish to be finished with stainless steel angles at the ends.

H-COLUMN FIXING CONDITION

H-column as part of structural frame in circulation shaft, not fastened to neighbouring building. Aluminium channel fastened to building, into which column clips into, to provide lateral support and allow for expansion movement between two existing buildings.

CONCRETE SLAB FINISH

The exposed cut ends of concrete floor slabs are covered with new H-section beams to announce the threshold between existing and added.

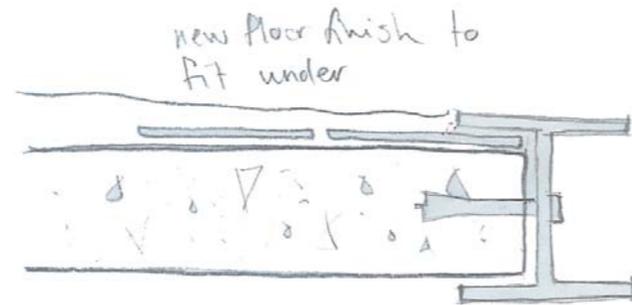


fig. 5.13. Concrete slab finish

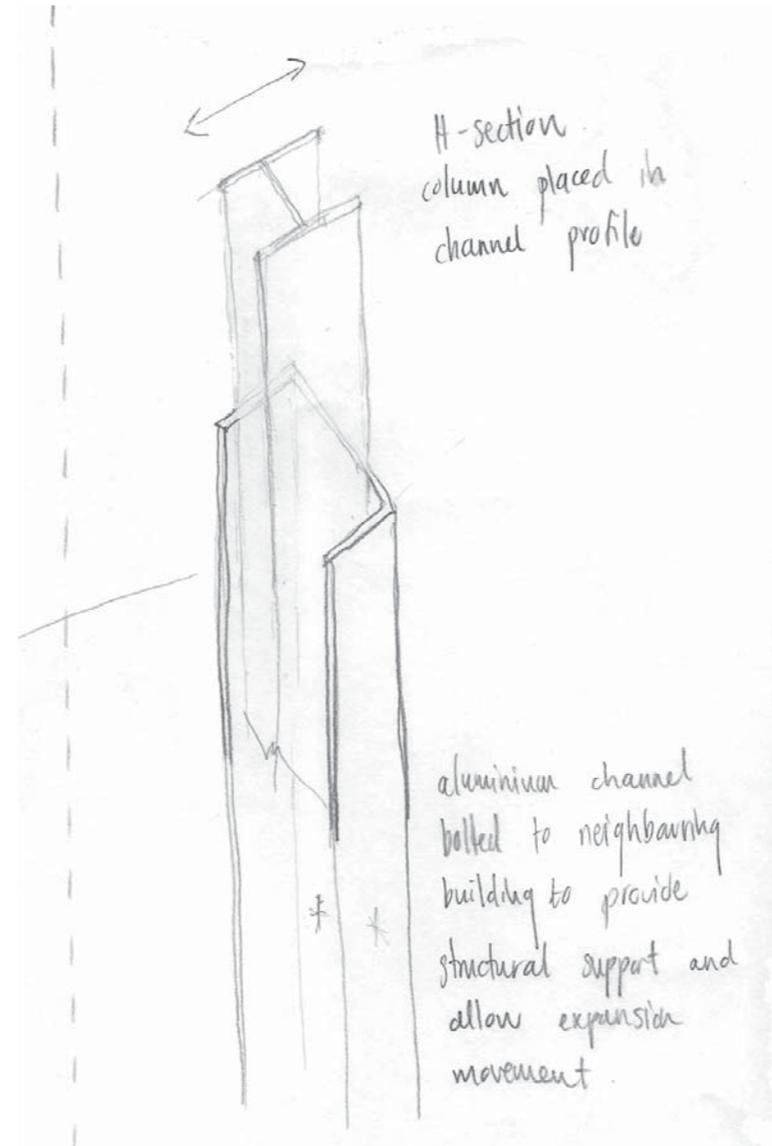


fig. 5.14. H-column fixing

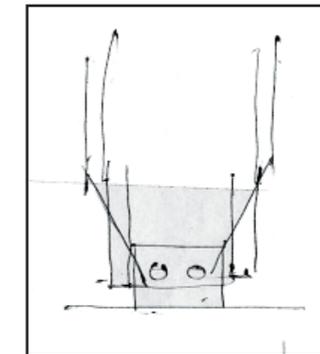


fig. 5.15. Inserted steel I-column fixing

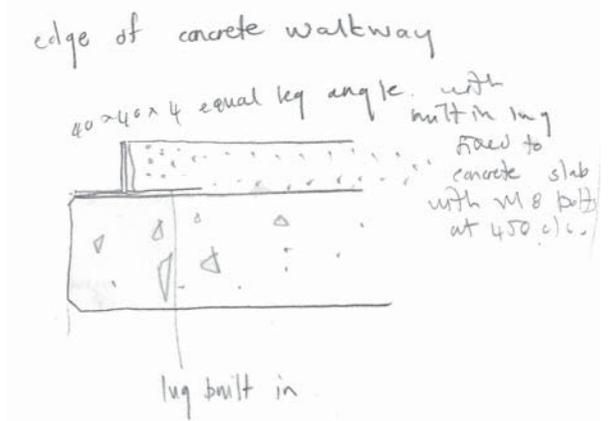


fig. 5.16. Floor finish

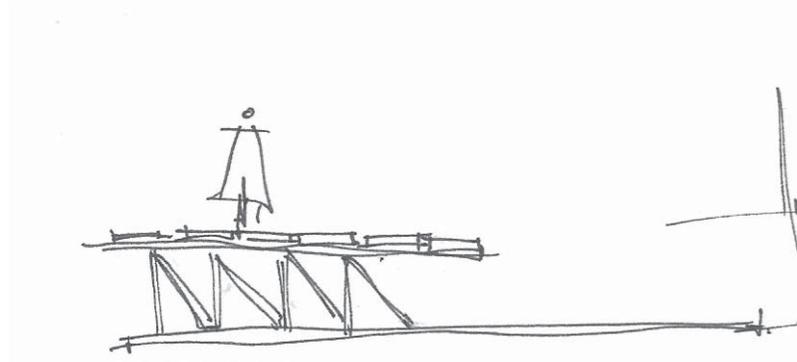


fig. 5.17. Raised timber floor

knowledge room

The materiality of the intervention inside the existing building addresses addition in a specific space. The intervention challenges a new perception of the double volume shaped by the barrel vaulted ceiling. The inserted composed elements propose new use of the existing space. A 400mm raised timber floor directs one into the area, and defines the circulation and cybercafé area by means of the level change.

The eastern wall is defined by curved fiberglass and polycarbonate panels. Suspended curved fiberglass panels are painted with white light reflecting paint to carry natural light from the existing east facing windows into the area. The windows will not create glare in the area with computer screens as they are 2100mm above raised floor level, and facing to the back of the computer screens. Each curved panel ends 300mm beyond an inserted tubular skylight panel, providing additional light to the area. An acrylic skylight dome is installed on the east side of the existing clay tile pitch roof. The existing roof truss should be strengthened with an inserted steel channel bolted to the truss, to support a steel cable frame to which the skylight and fiberglass panel is fastened.

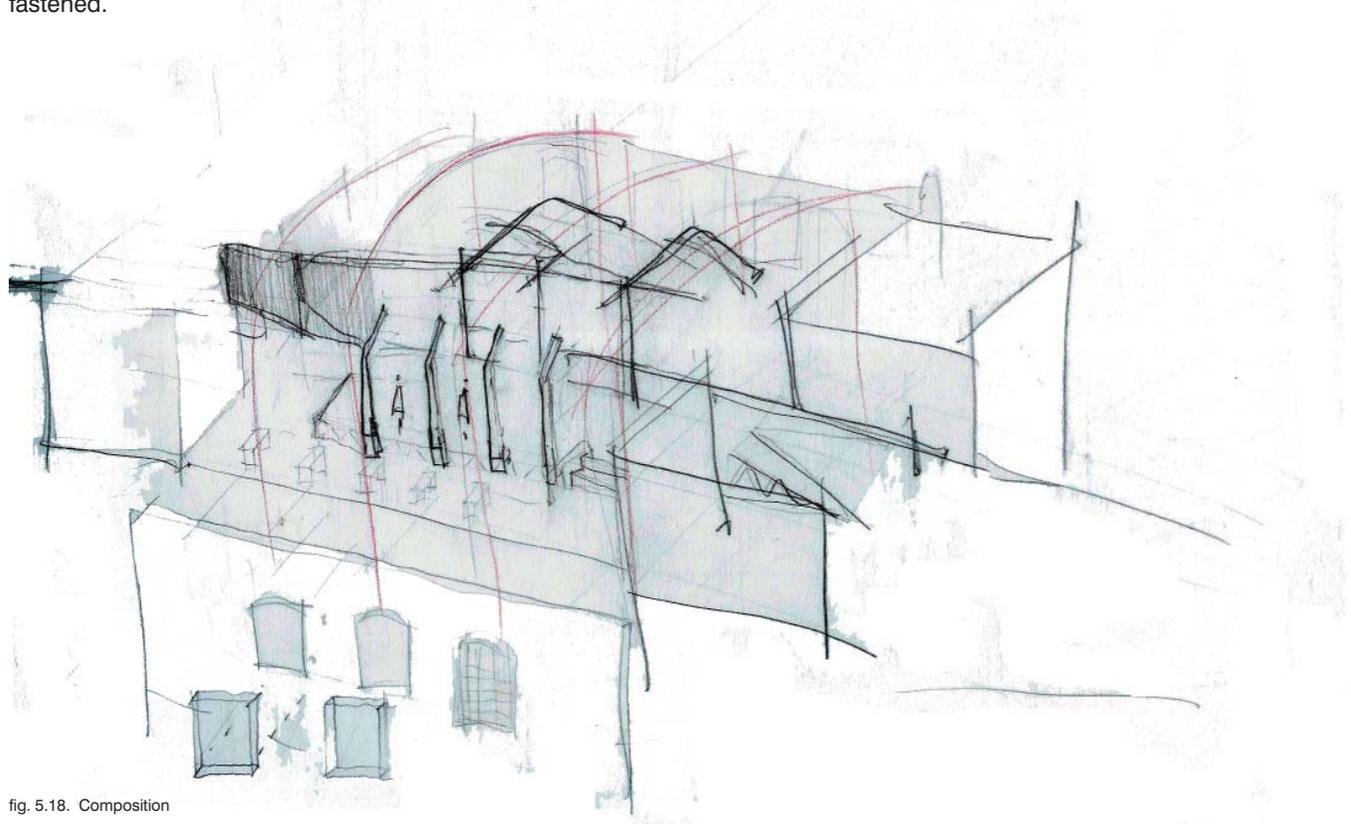
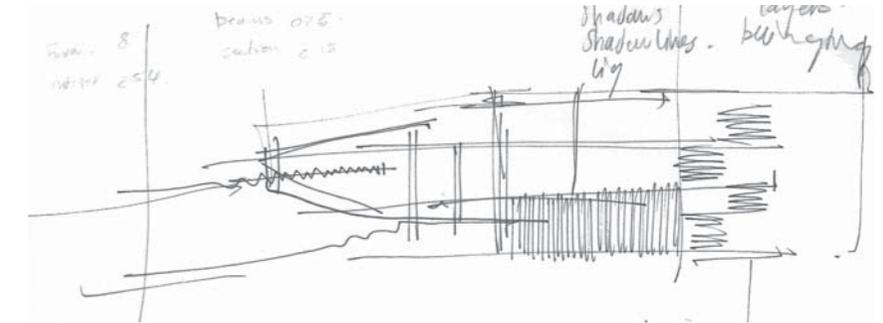
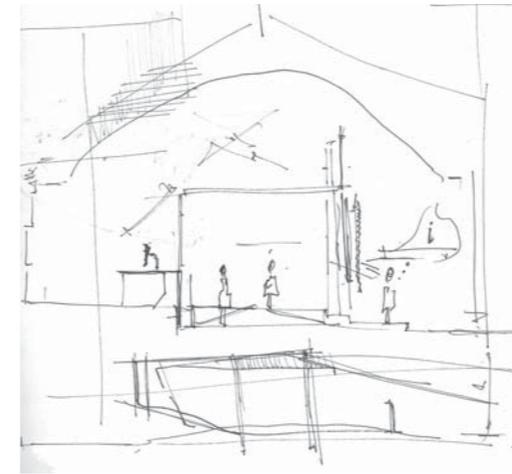


fig. 5.18. Composition



Continuous hot rolled steel i-sections form a structural frame for work stations in the cybercafé. Cast concrete keyboard desks, and 10mm frosted clear polycarbonate panels are inserted in between two columns, to provide backing screens. The panels are horizontally braced for support. The frames are bolted to the existing floor, underneath the raised floor and supported steel tension cables fixed to the strengthened roof truss.

Fluorescent striplights are inserted inside the flanges of the I-section columns and covered with perspex, to provide additional lighting.

Addition of protruding windows to the western facade, visually connects the Knowledge Room with the library courtyard below.

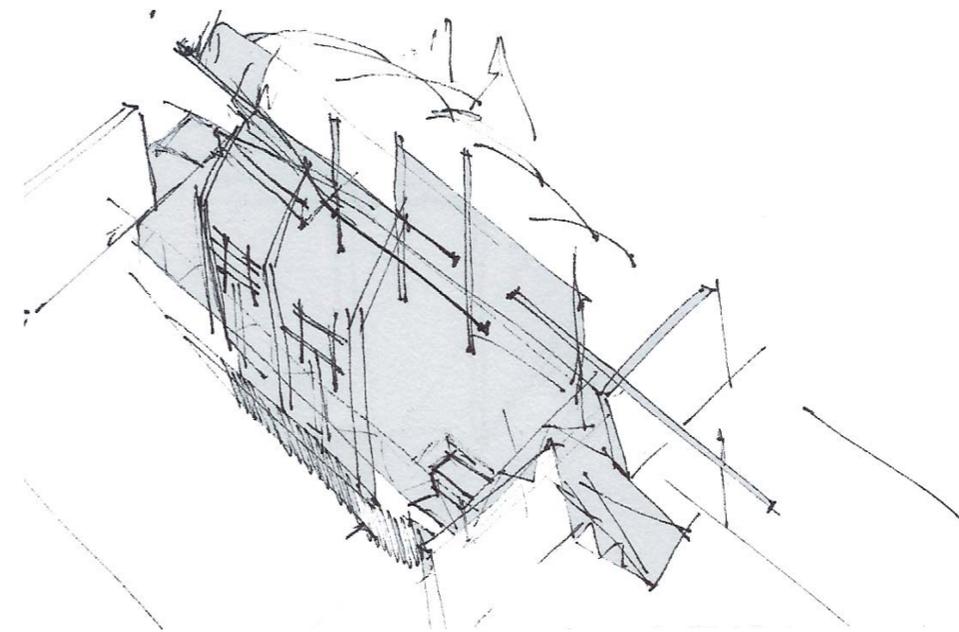


fig. 5.19. Composition of

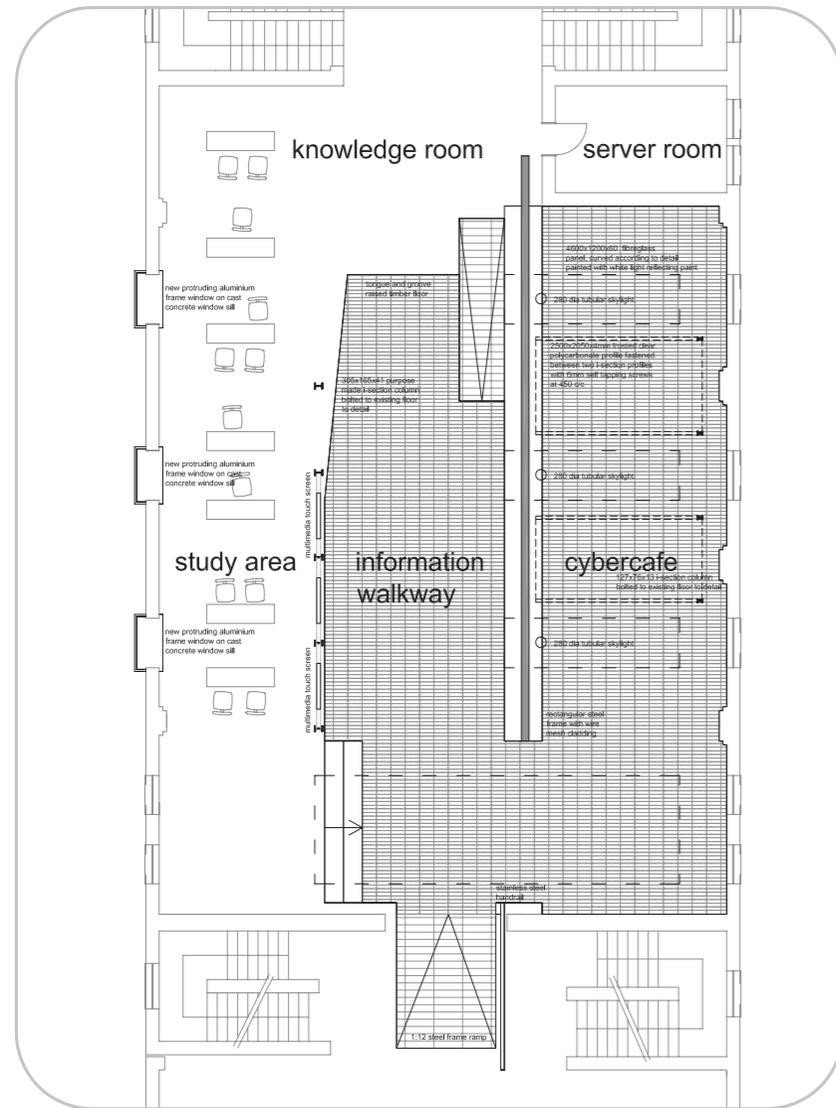


fig. 5.20. Detail plan of Knowledge Room. Scale 1:200

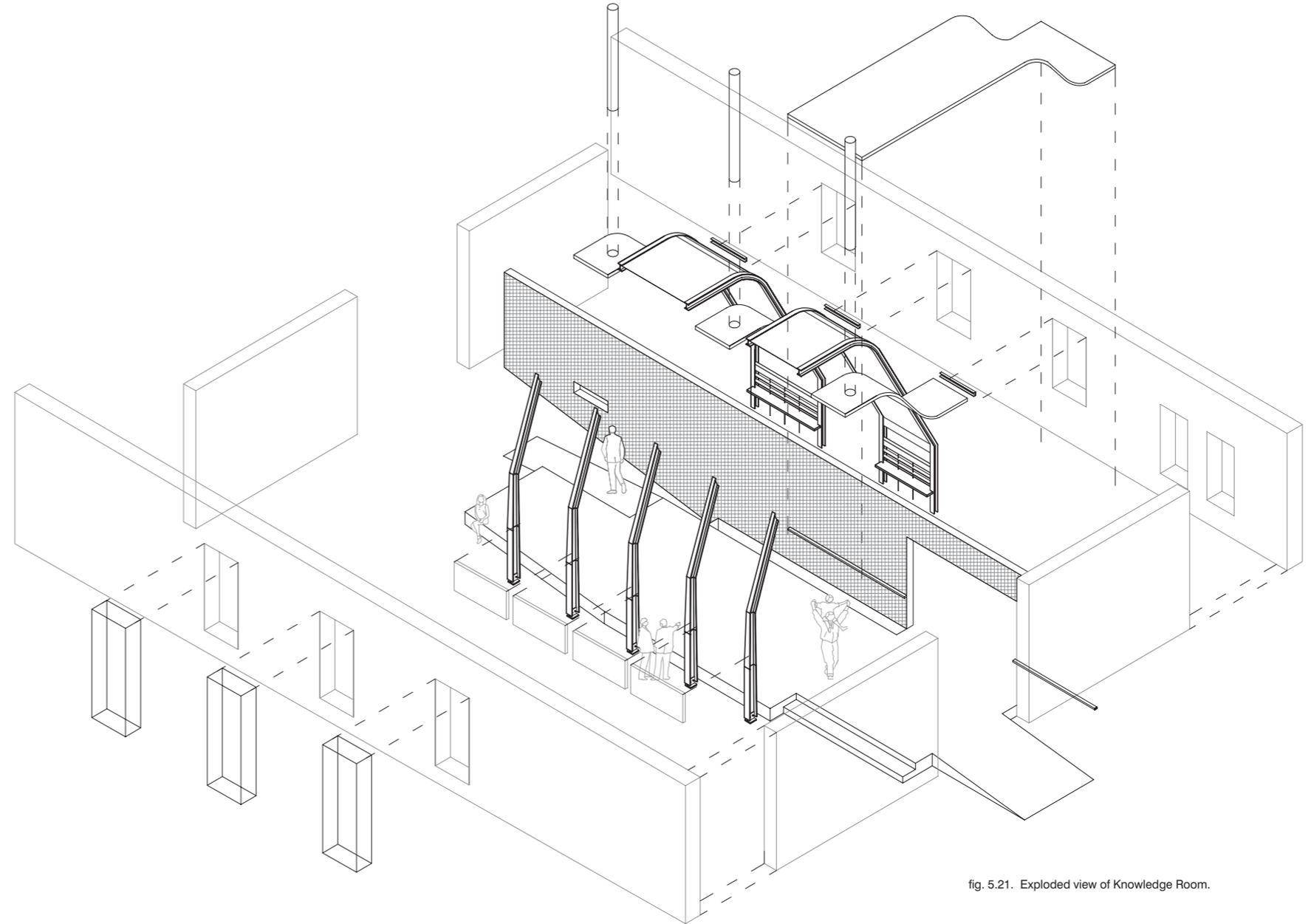


fig. 5.21. Exploded view of Knowledge Room.

circulation

The design forms part of the urban fabric and supports the flow and movement patterns of the CBD, especially the pedestrian network. The intervention uses the existing conditions to create a more successful place of encounter. Various routes and access points create a non-sequential experience of space, immersing the visitor in the event of the place. The success of the intervention relies on presence and movement through the area.

Circulation occurs on two levels. Horizontal circulation relies on the movement from either Vermeulen or Church Street through the Noordvaal Thoroughfare into the infill area, or directly from Vermeulen Street through the existing library building, into the infill area. The covered concrete walkway pierces into the existing building thus extending the horizontal plane of movement into the existing. The walkway provides a raised level of inhabitation and movement from the city floor. The accessible roof and level changes which doubles as seating adds to the flexibility thereof.

Two transparent staircase blocks, inserted into the 3,6m pan-handle allow for vertical circulation. It connects public presence and movement to all three levels of the existing building. They are visible from street level, announcing activity in the city. The blocks consist of a steel frame hanging between the existing library and the neighbouring building, supported by two H-columns.

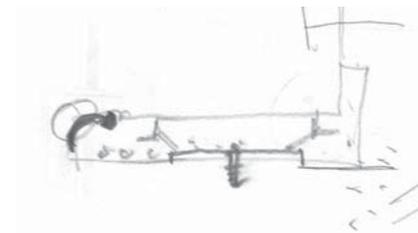


fig. 5.22. Cast concrete tread

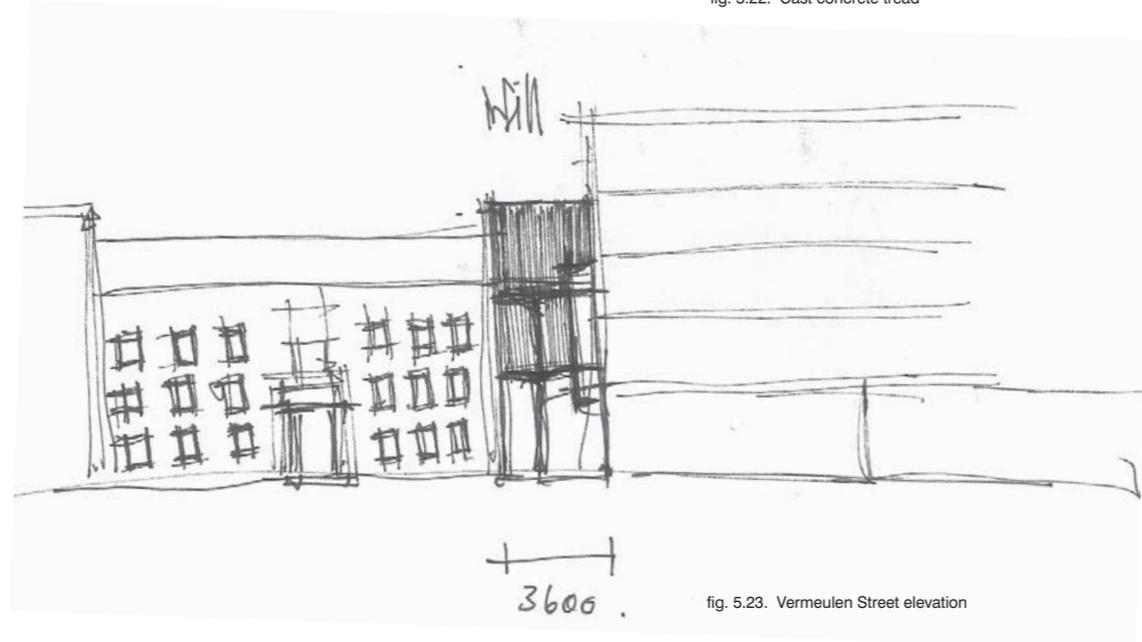


fig. 5.23. Vermeulen Street elevation

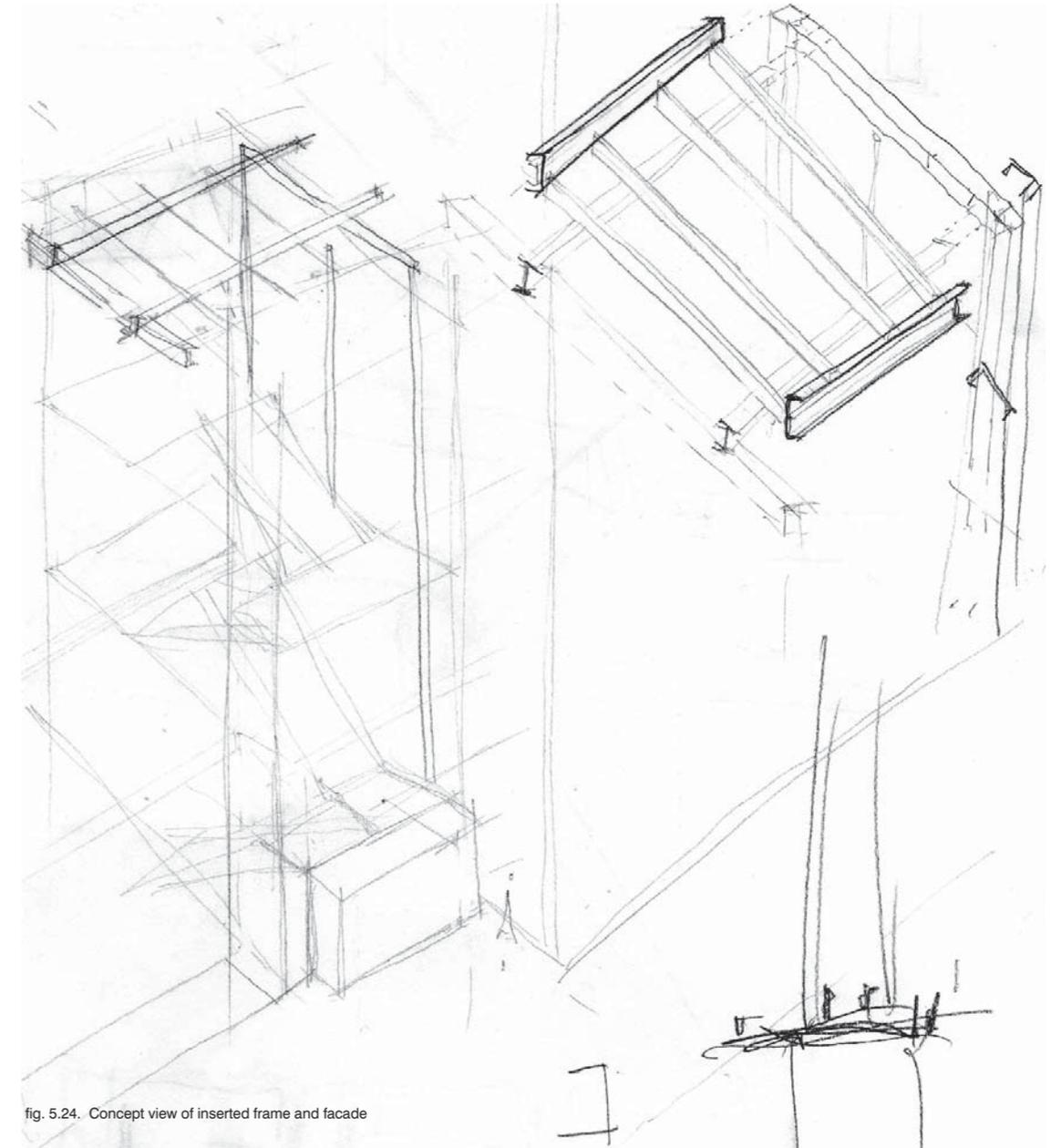


fig. 5.24. Concept view of inserted frame and facade

Stair construction is independent from the inserted frame and glass facades. The cast concrete tread profile are also used as canopy and window sill for the protruding windows in the Knowledge Room, as keyboard desks in the cyber café, and as balustrades for the accessible walkway.

An off-shutter concrete protruding block on ground level, facing the street elevation acts as the first landing. It is also a signage wall on street level. The concrete landing announces the first pause in the vertical block. The other steel frame landings with cast concrete infill panels are celebrated as platforms to look out into the city, courtyard or infill area. Spotlights underneath each landing lights the one below.

A lightweight composite roof covers the two blocks. Roof construction consists of plywood panels between 170x50 timber bearer beams supported by steel hangers, with an infill of lightweight concrete screed on top, providing sufficient insulation, for thermal considerations. Screed to fall to a stainless steel downpipe. The plywood panels act as shuttering for the screed as well as finished ceiling panels. A powder coated aluminium fascia ends the construction at both ends. The aluminium channel is the fixing member to the aluminium framed glass panel. The inserted frame supporting the roof construction is only fixed to the existing library building, and only leans against the neighbouring building to allow for expansion movement.

Fixed aluminium framed glass louvers assist in natural ventilation and the thermal comfort of the glass stacks. Aluminium framed sliding doors opens onto the private courtyard on ground level, which allows for fresh cool air to enter the area. The glazing occurs only on the north and south facades. Heat reflecting laminated glass is used to reduce direct radiation into the area.

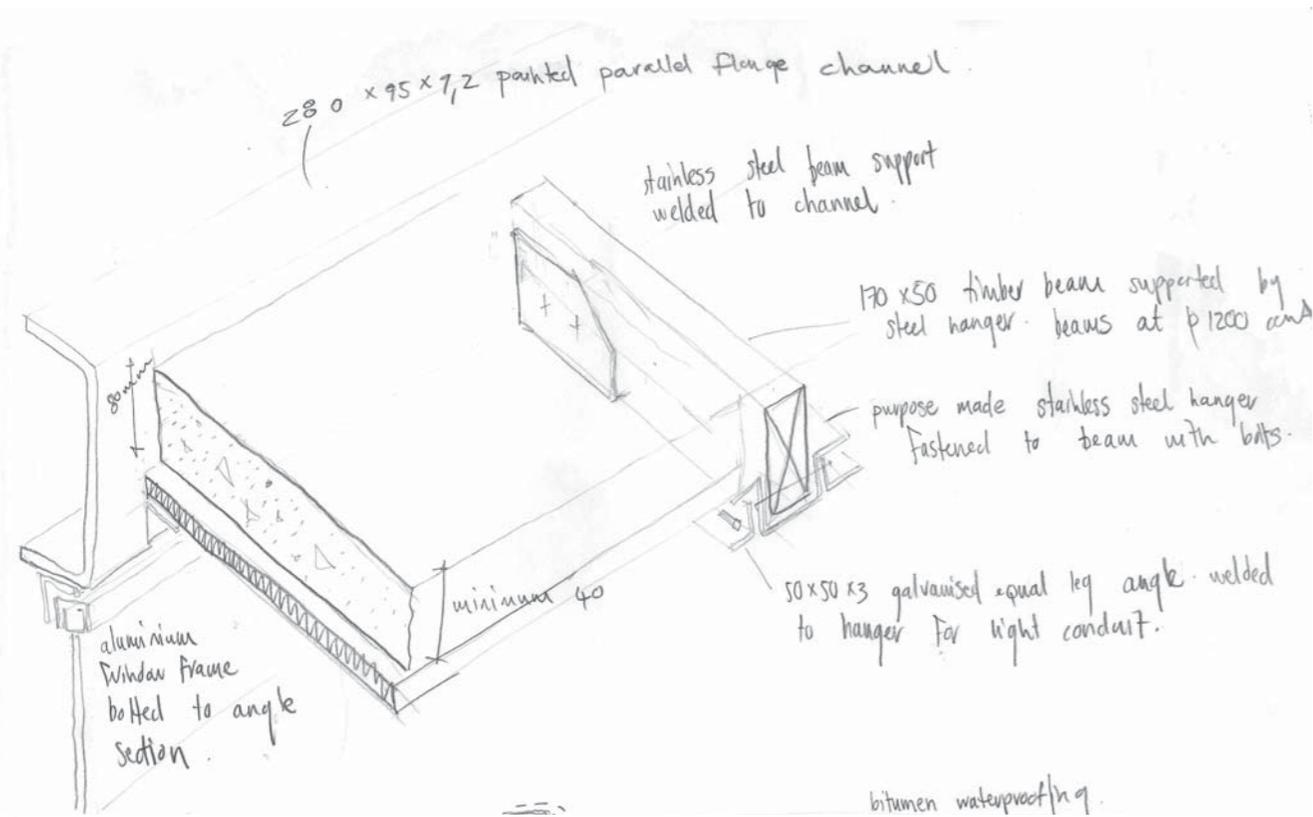


fig. 5.25. Detail construction of composite roof

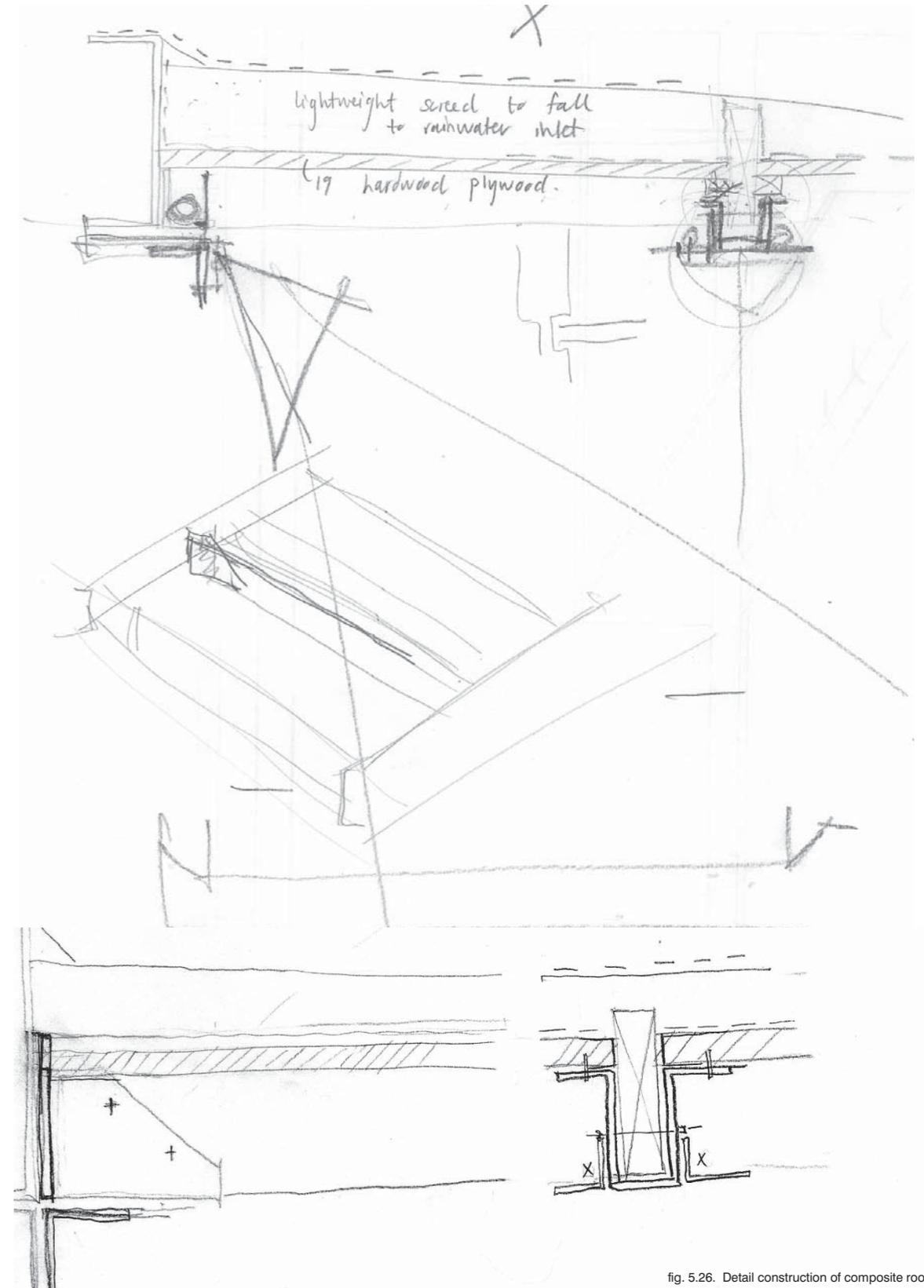
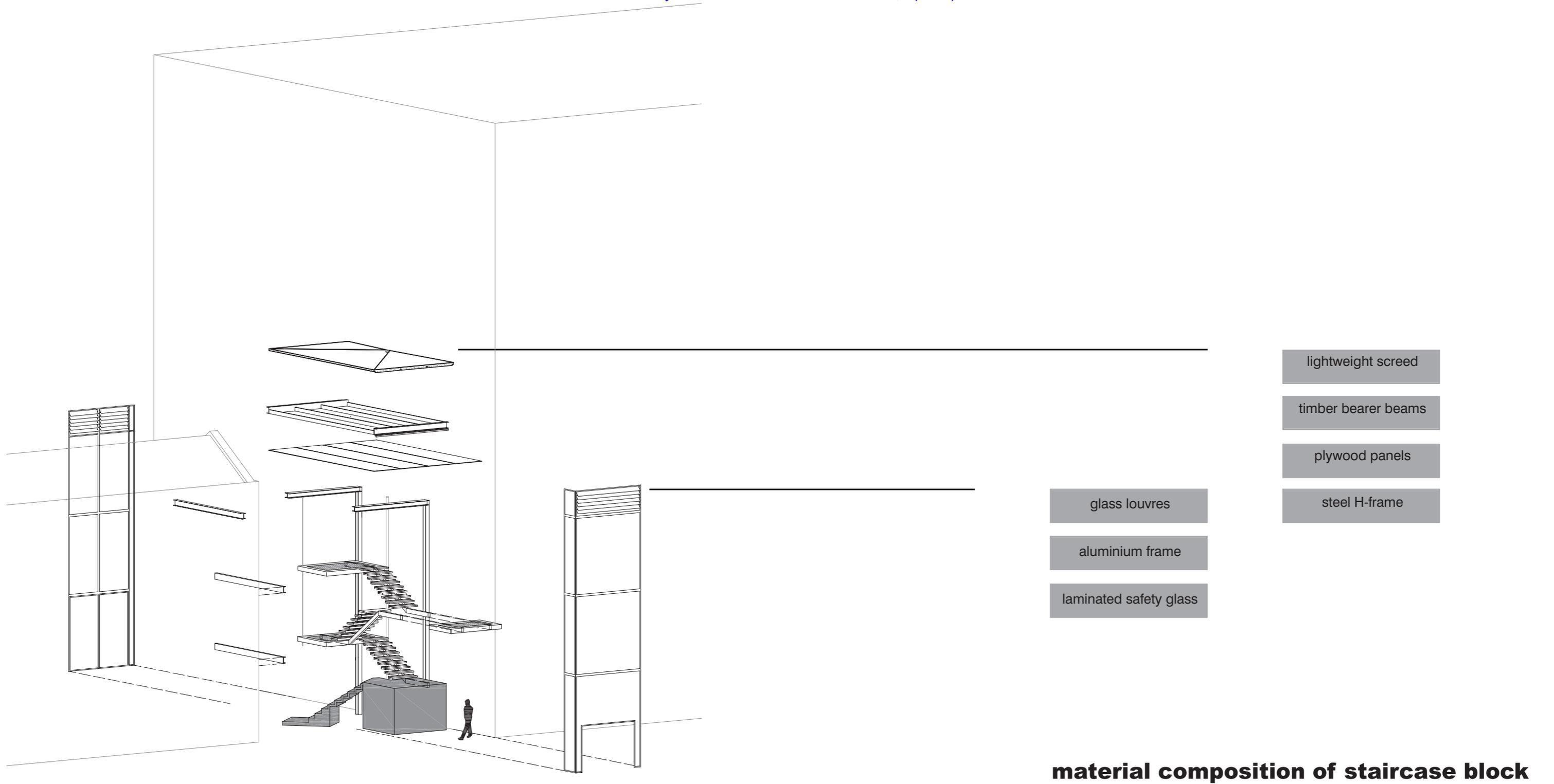


fig. 5.26. Detail construction of composite roof support



material composition of staircase block

fig. 5.27. Exploded view of staircase block

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