A public bathhouse

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Abstract This dissertation investigates the manifestation of a public bathhouse within a South African urban context. The proposal provides ablution and infrastructure to a public transport interchange precinct within Tshwane, Marabastad.

The architectural exploration aims to enrich the ritual of cleansing by introducing the act of bathing to the public urban environment. Challenges associated with the typology is addressed through integration with surroundings, ensuring the potential of social life centred around a fundamental human act. The goal therefore lies in a celebration of ritual as derived from context, not the imposition of an ancient typology, or an irrelevant programme.

The relevance to South African architecture is found in the investigation as a template for similar projects attempted in areas of similar context. A bathhouse is defined as an asset infiltrating, and proving for, its existing context.

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Green Star SA audit

The investigation of a possible application of Green Star SA on Landscape Architecture (see chapter 2) has shown that 44,2% of the rating tool can be applied.

The author concluded in chapter 3 that water appears to be the golden thread that links most on site systems and eco-system services; therefore all *green* aspects of the project was conceptually approached through investigating the role of water in every part.

From this the technical investigation of the project (see chapter 9) focussed on the three on site water systems: river system, rain and runoff system and grey water system. Where detail lacks in other technical aspects of the design, an informed assumption was made.

The self assessment audit (table 14) rates the project 37%. The score can now be divided by 44,2% to relate it back to the landscape applicable categories. Thus the project scores 83,7% which would be a six star rating.

Comparing Green Star SA Office V1 with the outcomes of the Sustainable Sites Initiative (SSI) investigation

Main themes form the SSI includes

- Conserving water sources and the systems they support while optimising the use of on site water and reducing the need for potable water
- Preserving existing natural and on site region appropriate biomass
- Using renewable- and waste minimising materials that does not pollute through manufacturing, application or after installation
- Optimise human use and health benefits by integrating the on site systems to improve the experience of man's environment

Through the Green Star SA Office V1 rating process and the study of eco-system services (listed above), the author found that the Green Star SA rating system addresses most of the themes from the SSI investigation.

The positive result of the audit might not be as accurate as one would hope because a lot of assumption had to be made with regard to basic building information that was required and estimated.

From the comparison

The author believes that converting the Green Star SA rating tool into a fully fledged landscape rating tool is well within reach. In the envisaged tool, there should

The need of cleansing

The proposed investigation originates from a need identified within the South African urban context. Basic ablution facilities are often not provided, or are unusable in South African cities. Municipal priorities and economic realities commonly lead to their degradation. Public ablution buildings often become neglected, vandalized and generally dangerous environments. This common scenario arises from the tendency to isolate ablution buildings from the public, not celebrating their public potential.

The aim of this proposal is to address this situation through a public place of dignity and social potential centred on the enrichment and celebration of the necessary ritual of cleansing. Considering a public building as a reflection of its users implies experiential quality as a means of integrating a personal ritual with its environment. The intent is to create a social and economic asset to a community, not a vandalized loss to a municipality. The programme proposes a democratic place through exploring the inherent properties of architecture-not a building as sign or personal statement, but a shelter to be used and a canvas for experience as a bathhouse.

A brief history of public bathing

The bathhouse as an architectural typology has a rich and established history. A contemporary investigation of this typology requires a clarification of relevant terms and concepts, ensuring that the project is undertaken within the appropriate context. Crucial to this undertaking is an appropriate definition of the term 'public bathhouse', as it forms a base for interpretation of the investigation. Considering classic, contemporary and local precedent; that which is considered core to a public bathhouse is identified, considered, adapted and possibly discarded. A model of superimposing contemporary advantages onto the ideals of a classic bathhouse is investigated, aiming to avoid the imposition of an alien, ancient or inappropriate intervention. Site, client and end-user are identified to assist in contextual resolution and appropriate response.

In essence, a public bath originates from a communal need for a place to clean (in times or places) where fine grain infrastructure is not available to all, be it through a lack of technology, availability of resources or prejudice. Communities therefore gather at places of communal bathing where a central facility is able to serve a large population efficiently (Showerman, 1931: 357).

Public baths consequently appear at a variety of times and places throughout the world. Examples being the Turkish hamman, Japanese onsen or sentõ, Finnish sauna, Russian banya and Roman thermae. Public baths appear in architectural and social history from the 6th century BCE to present (Anon, 2009), and is not solely a romantic, classical typology, although investigation of the classic is considered relevant.

The Roman thermae as a classic precedent embodies the closest relation to this dissertation, where government involvement, democratic access and servicing potential relates to the proposed urban context of the investigation. The built form of the Roman bath is not the focus of the investigation, the emphasis lies in understanding the growth and role of the bath within the Roman city and society. Thermae evolved from the Latium of the country where one could wash the feet, hands and face on a daily basis and only washing the entire body at intervals, progressing towards the great baths of the emperors where washing of the whole body was possible and daily baths were considered the social norm. With the increase of popularity of bathhouses, certain additions of convenience were made to the original facility, ultimately resulting in the inclusion of medical, hygienic, athletic, lounge and library facilities (Showerman,1931: 355-358). The individual interpretation of available facilities encouraged a personal ritual of use.

Figure 1.
Photograph of a public toilet in Marabastad.

Prices and funding structures were managed in a manner that promoted accessibility. This system ensured personal ritual ranging from a visit for cleanliness out of need, to exercise, preparation for dinner, meetings and debate (Showerman,1931: 358).

Contemporary bathhouse

It is crucial to note the shift in the nature and perception of the public bathhouse since the Modern era. Coinciding with the improvement of service delivery to private dwellings, the role of the public bathhouse changed. Considering the contemporary example, the thermal baths at Vals by Peter Zumthor (1996), proves the case in point. Relevant to its affluent context, the bath serves as a recreational and profitable addition to a hotel complex. Whether this building is to be considered a true public bathhouse is questionable, as it provides to a limited range of clients whilst physical, necessary cleaning of oneself is not the primary goal of a visit. Formally the baths at Vals can be defined as a private spa, rather than a public bathhouse. A public bathhouse has origins in providing a necessary service, as thermae embody. While access to thermae was available and encouraged to all citizens, the baths at Vals is considered to embody a character of exclusion rather than inclusion.

Locally this same phenomenon of exclusion appears in the case of wellness centres, spa's or gym facilities, where access is granted on the base of membership or entry fees. Although these facilities aren't strictly bathhouses, the nature of the shift away from providing a basic service is evident. In contrast, the Roman thermae were accessible, subsidised and functional baths, with exercise and wellness facilities attached over time. The contemporary examples of exercise facilities do not provide the necessary service of cleansing as primary goal.

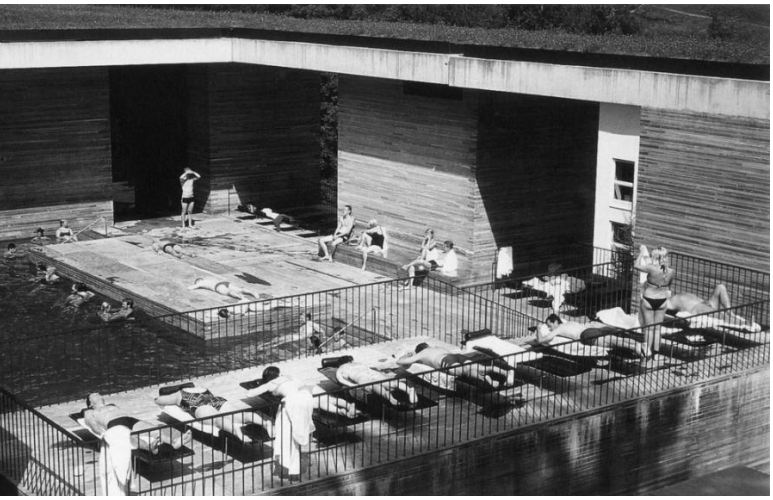
The work of Rodney Harber is investigated as a contemporary South African precedent of public ablution and bathing. In essence the core of a public bathhouse provides a service to an area that does not have basic ablution facilities. Expanding on the basic need, Mansell Road bathhouse deliberately includes and anticipates for a layer of commercial activity, thereby expanding the programme and providing opportunity to vendors, realizing a true public bathhouse. The bathhouse includes ablution facilities, accommodation and opportunity for formal and informal trade (Low, 2005:5). The inclusion of commercial activity as a part of public ablution facilities addresses issues of security within an urban

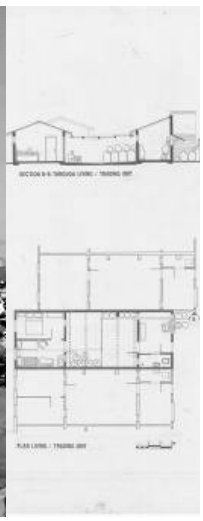
Figure 2. (opposite top) Photograph of the present condition of Roman baths at Bath, England, displaying its adapted function as tourist attraction.

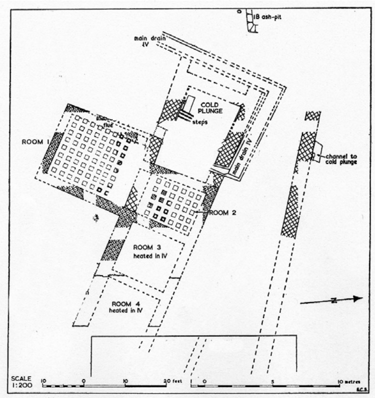
Figure 3. (opposite middle) Photograph of the thermal baths at Vals by Peter Zumthor.

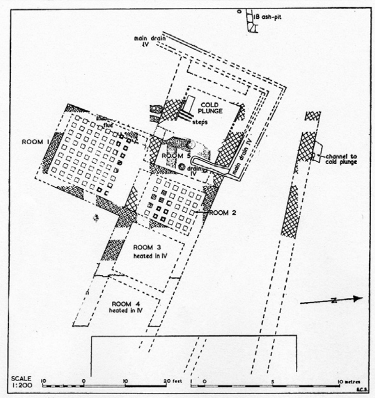
Figure 4. (opposite bottom) Photograph, plan and section of the bathhouse in Mansel road, Durban by Rodney Harber.

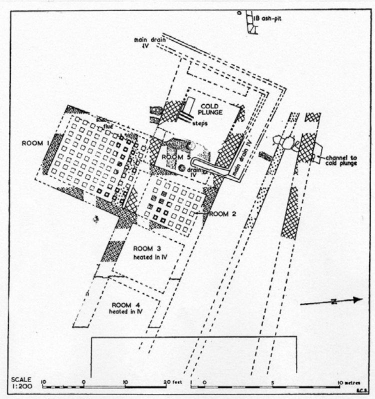
Figure 5. (opposite right) Photograph of an utaseyu shower at a Japanese hot spring.

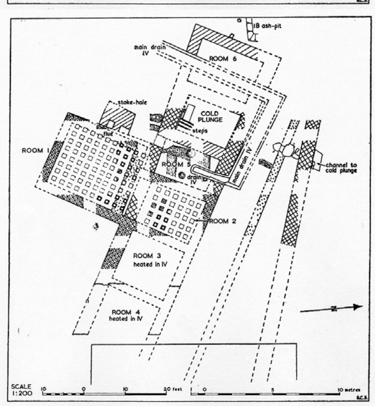


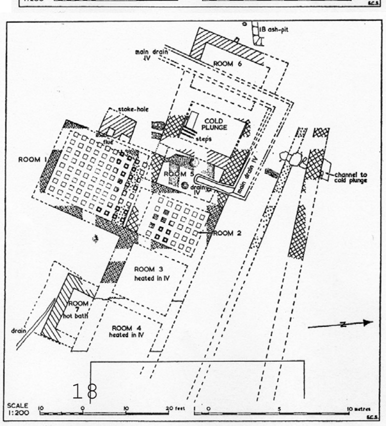












setting. By providing passive surveillance through the permanent presence of shopkeepers and clients, a form of community policing, as defined by Jane Jacobs as the 'eyes of the neighbourhood', are introduced. The result is a commercial niche, specifically relevant to the users of a bathhouse. This public bathhouse encourages opportunity and variety, enriching the bathing ritual and confirming the building as a public bathhouse.

The presence and involvement of a community with direct interests in the bathhouse could facilitate the transfer of ownership, intentionally, or if conventional municipal support might be withdrawn in the building lifespan. Criticism arises when the built form of the Mansell Road is considered. The built structure accommodates programme functionally, but hesitates to celebrate the act of cleansing through experience. The question is asked whether an understated, hidden building realizes the social potential of the act of cleaning.

Defining the public bathhouse

A South African bathhouse could be defined as a service facility within an environment where densities of potential users who share the communal need for ablution, is identified. This intervention could act as social and commercial catalyst within its context, thereby enriching the ritual of bathing through its location in the public realm.

A bathhouse in the urban context of South Africa should embody a democratic attitude of accessibility, thereby informing the architectural programme. In terms of built form the building must realise a balance between quality of design, durability and avoiding an inappropriate character.

Issues surrounding safety and security can be addressed by ensuring privacy without isolation; achieved through the provision of deep edges and implied passive surveillance. The ownership and funding structure together with the possible transfer thereof, should acknowledge the local conditions. Ultimately, the public bathhouse should integrate ritual with the environment through the architectural experience.

User, client, site

A projected 40 percent of households in Gauteng have safe running water available in dwellings. However, the majority of these dwellings are not located in rural or informal settlements. Within these communities, access to water, especially water for bathing, is still limited. A communal tap, or tap on site, is commonly the primary source of water (Statistics South Africa, 2007:39). This service situation defines the primary user of the proposed bathhouse as commuters travelling to and from rural areas and informal settlements to the city.

An estimated 81 200 people commute from informal and rural areas to Marabastad by rail, bus, taxi (Tshwane strategic public transport plan and network, 2006). Included in these estimates is the proposed bus rapid transit system (BRT operational plan, 2004). Marabastad, Northwest of the Pretoria CBD, with its scattered, underserviced and informal public transport nodes, is identified as the study area. Marabastad provides the opportunity for the project to facilitate a connection between commuters, vendors, the homeless, visitors, and residents on the level field of partaking in a ritual of basic human need. Through appropriate location and design of the public bathhouse, communities that engage with and use Marabastad, could find common ground and mutual support.

An informal survey conducted in the Belle Ombre rail station and surrounding area, as barometer for public transport interchanges in Marabastad, confirmed the potential user base. Interviews with vendors, shop owners taxi drivers and commuters were conducted. Taxi drivers waiting between rush hours, or long distance drivers who stay in town for several days, gave a positive reaction to the project proposal during interviews. Shopkeepers and vendors also responded with optimism, while commuters agreed with the idea. In conclusion 73 percent of those interviewed responded positively and would appreciate a bathhouse in the vicinity of Belle Ombre station. Only 2 respondents disagreed with the proposal (Author, 2009:1-10).

The current and projected large number of people utilizing public transport would serve as the base of users. The possibility therefore exists to initiate a Public-private partnership. Various entities could be approached to act as joint clients for the implementation and maintenance of the project. A system of presentation of transport ticket stubs in exchange for a token to use the ablution facilities could aid in cross-subsiding costs. Sponsorship through advertisement beneficial for an institution wishing to promote its interest in public wellbeing can act as an ancillary means of funding the facility. Originating from the Roman example of emperors using the bathhouses to gain the favour of the citizens (Showerman, 1931: 357). The ultimate goal would be to transfer ownership and management of the bathhouse to a local community. It is envisioned that buildings around the bathhouse transform to service the newly established market in the form of barber shops, hairdressers, gyms, laundromats or light industry to supply soaps. Proposing thereby that enough businesses and individuals can become involved to ensure a feasible support structure, in the case of ownership transfer.

Figure 6. (opposite) Diagram illustrating the additions of convenience and necessity made to the Roman thermae at Leintwardine between Ad 140 and present

Figure 7. Collage of a metro rail ticket stub, enabling use of the bathhouse.

02. Context

Figure 8. Satellite photo highlighting Tshwane municipality and the Pretoria CBD.

Figure 9. (opposite) Aerial photograph of the Pretoria CBD, highlighting Marabastad.

Background to study area

The area of investigation, Marabastad, is identified through consideration of programme and user. Marabastad acts as a portal to the city for a large community of commuters who use Belle Ombre rail station, various municipal and provincial bus systems and taxis to enter the city. However, Marabastad implies more than a simple place of public transport modal interchange. The area is a vibrant fine grain mixed-use suburb, with an established and expanding residential, commercial and entertainment character.

Historically the Marabastad area has been a neglected corner of the Pretoria inner city, having been allocated to the Black, Asian and Coloured communities under a succession of laws characterized by discrimination in attitude to land tenure. The Community Development Act of 1966 stunted all development in the area for three decades. The result is a suburb degraded into slum conditions, with inadequate services and disintegrated community life (Aziz Tayob Partnership, 2002: 24). Recent attempts to re-establish Marabastad have been delayed by unresolved land claims following the forced evictions of 1940 to 1953. As nearly all land claims have been finalized, thereby opening the opportunity for development of Marabastad. Municipal projects in the area are underway or reaching a stage of completion. These include an informal trade market and a jazz park amongst others.

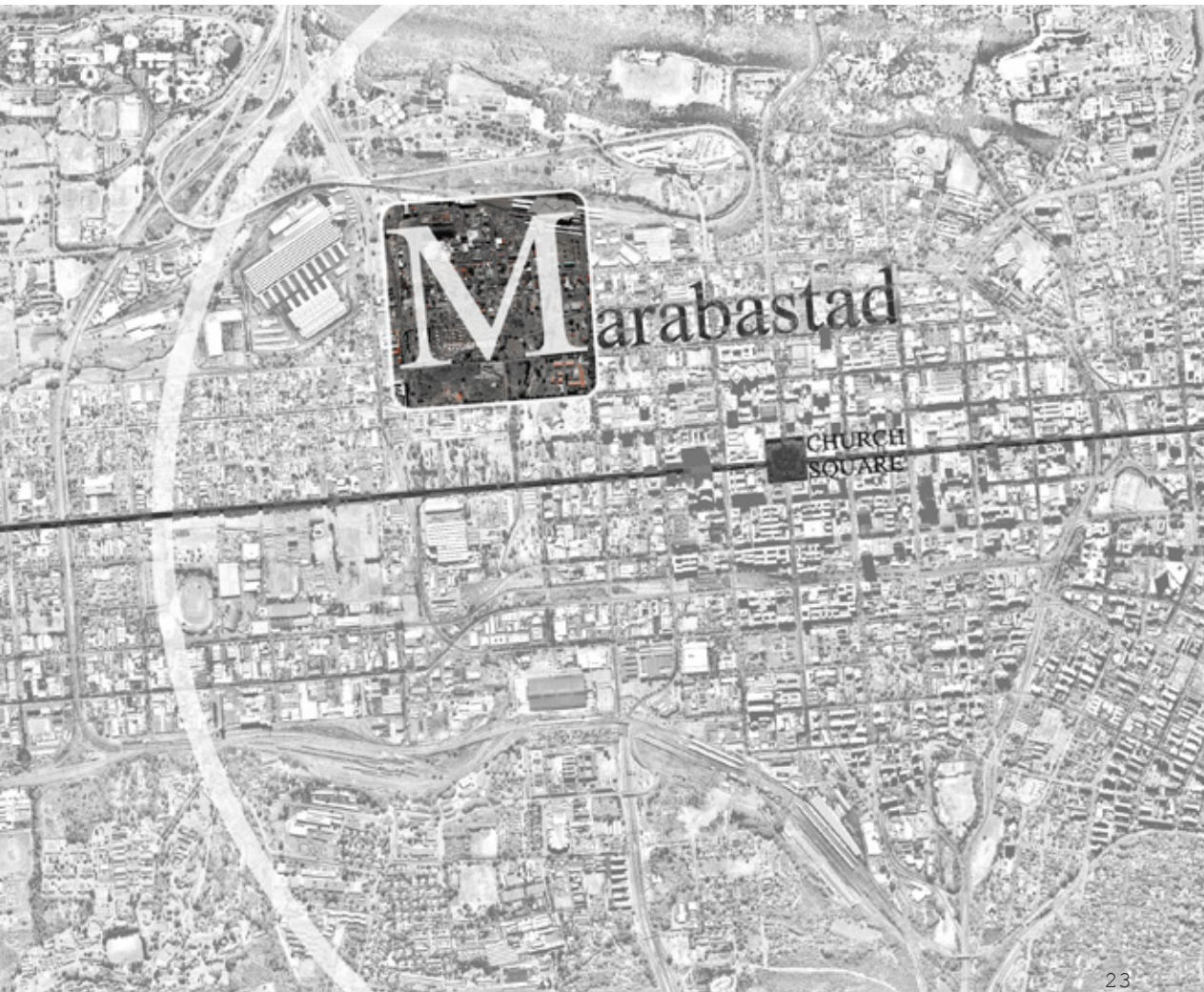


Figure 11

Figure 12

Marabastad, as a modal interchange of public transport, hosts 18 % of the informal trade of Pretoria. Informal trade is considered as a growing economy and a means of alleviating unemployment(Aziz Taoyb Partnership, 2002:103). Traders in Marabastad are well established and supported by regular customers. Most formal traders consist of members of the local Indian community while informal traders are diverse in origin (Aziz Tayob Partnership, 2002: 126).

The presence of formal trade along the Boom Street corridor, together with informal trade at the intersection between 11th and Boom Streets support the potential programme. Existing and future commercial activity considered integral to the public bathhouse is foreseen to harmoniously coexist within this environment.

Figure 10. Aerial photograph of Marabastad. White highlighted areas indicate the highest concentration of informal trade (Kunz, 2007:15).

Figure 13. Photograph of Belle Ombre rail station from the eaSt.

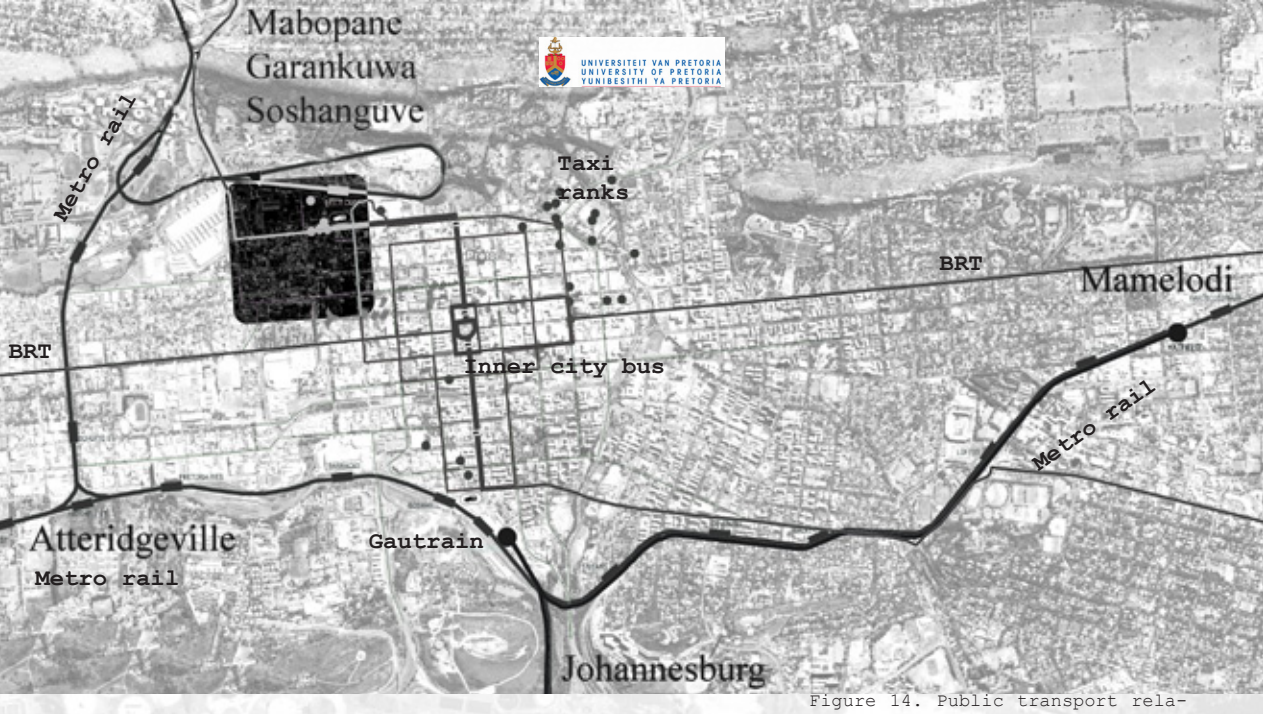
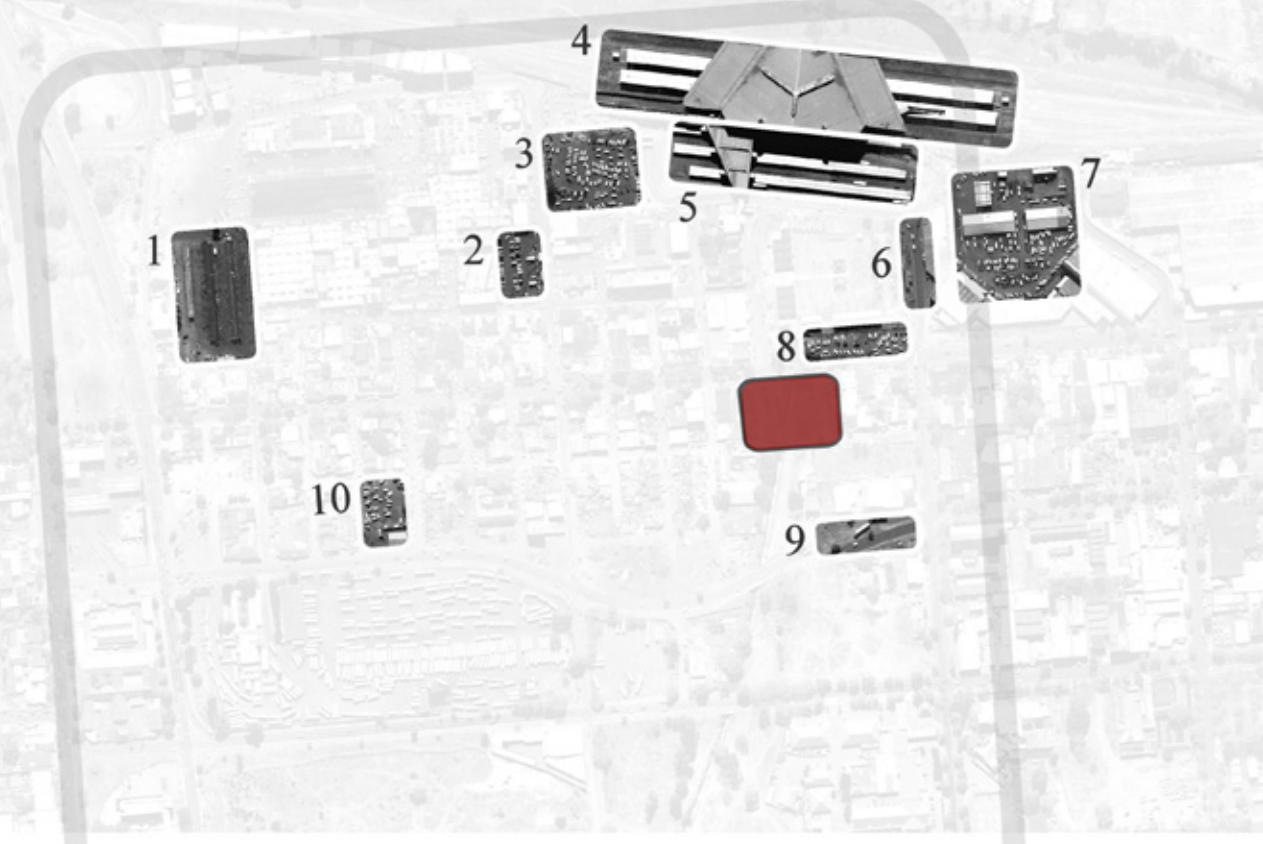


Figure 14. Public transport relative to the Pretoria CBD.



Public transport

Figure 15.

Figure 16.

The area of Marabastad is reflects a largely informal, fragmented public transport modal interchange. The Streets of Marabastad serve as the connection between different modes of public transport. The result is a lack of formalized service delivery to commuters and operators of public transport. The superimposition of public transport onto the fabric of Marabastad does provide opportunity and commercial viability to residents and vendors.

1. Putco bus rank- 12 000 persons/day
2. 7th St. Informal taxi rank- 500 persons/day
3. Bazaar St. Informal taxi rank- 3 500 persons/day
4. Belle Ombre train station- 24 000 persons/day
5. Belle Ombre bus stop- 9 000 persons/day
6. Inner city distribution bus stop proposed by the city of Tshwane
7. Belle Ombre Informal taxi rank- 700 persons/day
8. Proposed BRT terminal- 11 150 persons/day
9. Proposed BRT stop- 11 150 persons/day
10. Jerusalem St. Informal taxi rank- 3 500 persons/day

(Aziz tayob Partnership, 2002:138)
(BRT operational plan, 2004:30)

Figure 17. Aerial photograph of the study area highlighting public transport nodes in Marabastad

Figure 18. Despite its importance as a public building, the Belle Ombre railway station is isolated from its environment through its inhuman scale. Along with the railway track loop, the station forms the northern border of Marabastad

Figure 21.

Figure 22.

Pedestrian activity

Pedestrian activity at peak hours generally results in an east-west migration of commuters as they pass through Marabastad. The major pedestrian artery through Marabastad is Boom Street, with most commuters moving along Boom Street at some point in their journey. An alternative route to and from the CBD is along the Steenhoven spruit, where pedestrians move into Church Street.Within Marabastad Most public transport nodes fall within a 5 minute walking distance from one another, allowing for comfortable movement from one grain of public transport to another. Contributing to the success of Marabastad as a public transport modal interchange, however fragmented.

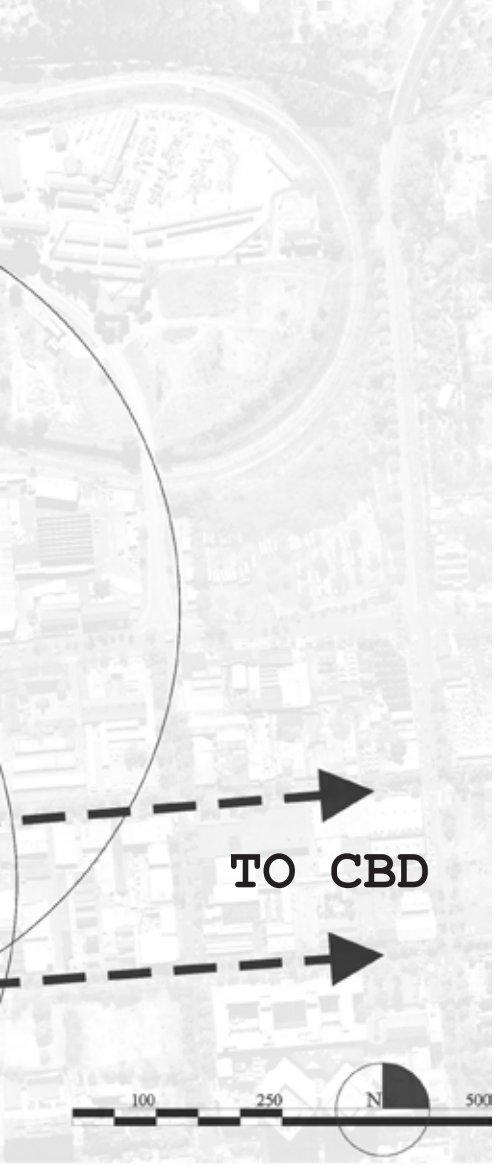


Figure 19. Aerial photograph of the study area illustrating pedestrian movement.

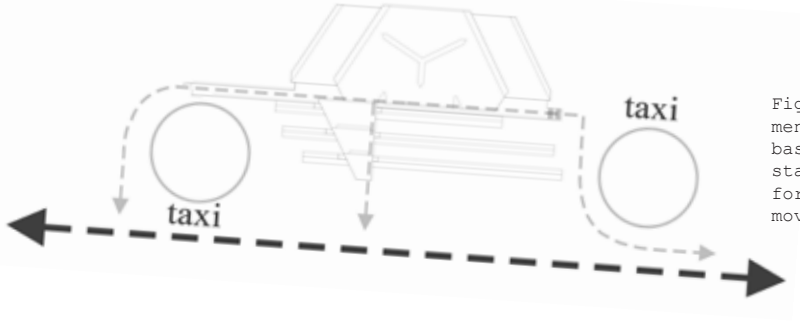
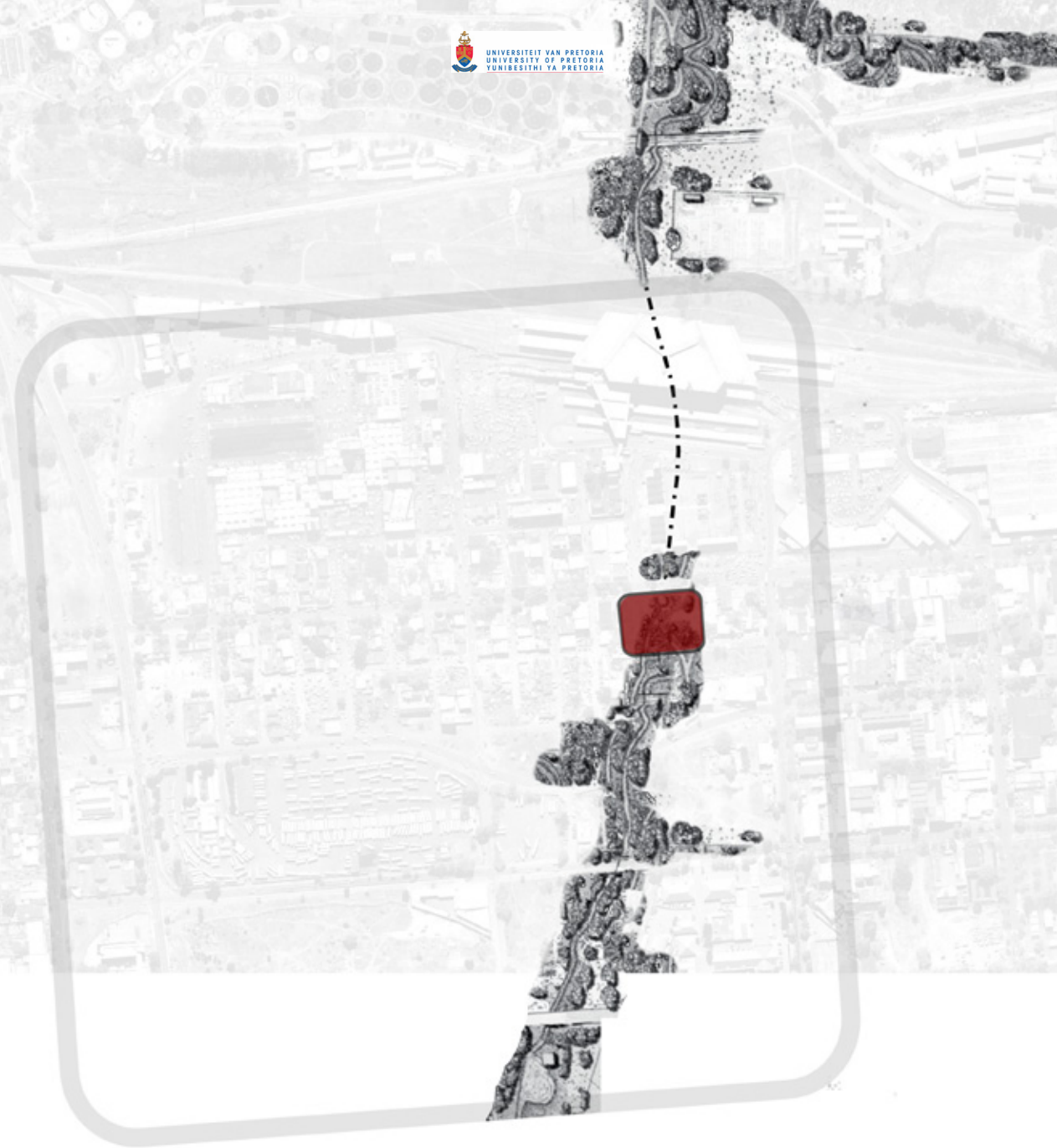


Figure 20. Diagram illustrates movement between modes of public transport based on the layout of Belle Ombre station, also the manner in which informal taxi ranks establish around the movement of people.

Figure 23.



Steenhoven spruit
stormwater channel

Steenhoven Spruit, despite its current canalised condition, remains the dominant natural asset of Marabastad. The Marabastad Development Plan, proposed by Aziz Tayob architects , allows for the entire length of the spruit from Princes Park in the south to Boom Street in the north to be developed into a pedestrian green corridor. Potential extension beyond the Belle Ombre station north to the Apies River is envisioned, to be developed into a public green belt to form part of the city-wide green and open space network. The Steenhoven Spruit redevelopment could house a variety of regular activities, such as a permanent or weekly African Arts and Crafts market. The future growth of Marabastad as tourist attraction will indicate if this is feasible (Aziz Tayob Partnership, 2002: 232). Currently the channel terminates at Boom Street, from where it runs underneath an electrical substation and Belle Ombre station (fig.27). The proposed site intends to celebrate this termination of the Steenhoven spruit through a meaningful use of water.

Figure 24. Aerial photograph illustrating the proposed development of the Steenhoven spruit stormwater channel.

Figure 25. (opposite left)
Channel from Boom St.

Figure 26. (opposite centre)
Channel from Bloed St.

Figure 27. (opposite right)
Channel towards Boom St.

Figure 28. Sketch of envisioned treatment of the Steenhoven spruit.

Figure 29. The Pretoria CBD open and green space network.

Urban green and open space network

Figure 30. Pretorius square

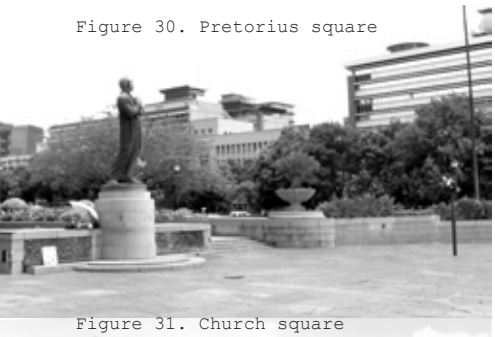


Figure 31. Church square

Steenhoven spruit and its floodplains could be developed as parkland, intended support pedestrian routes within Marabastad. Within this park a play field (soccer field), shallow lake (duck pond) in the portion flanked by the housing developments, surrounded by lawns, for recreation of the residential population and trees along the banks to provide shaded pathways are proposed (Aziz Tayob Partnership, 2002:207). Figure 29. illustrates the relationship between Marabastad and the Pretoria CBD through existing and proposed open and green space network. The successful formalization of green space in Marabastad could serve as connection between Marabastad and the Pretoria CBD.

Figure 29. (opposite top left)
Legend:

1. Heroes acre
2. Formalized Steenhoven spruit park
3. National zoological gardens
4. Church square
5. Lillian Ngoya square
6. Pretorius square
7. Burgers park
8 Pretoria station square

Figure 32. The open and green space network relative to Marabastad and site.


FASHION
SUPERETTE
SUPERETTE

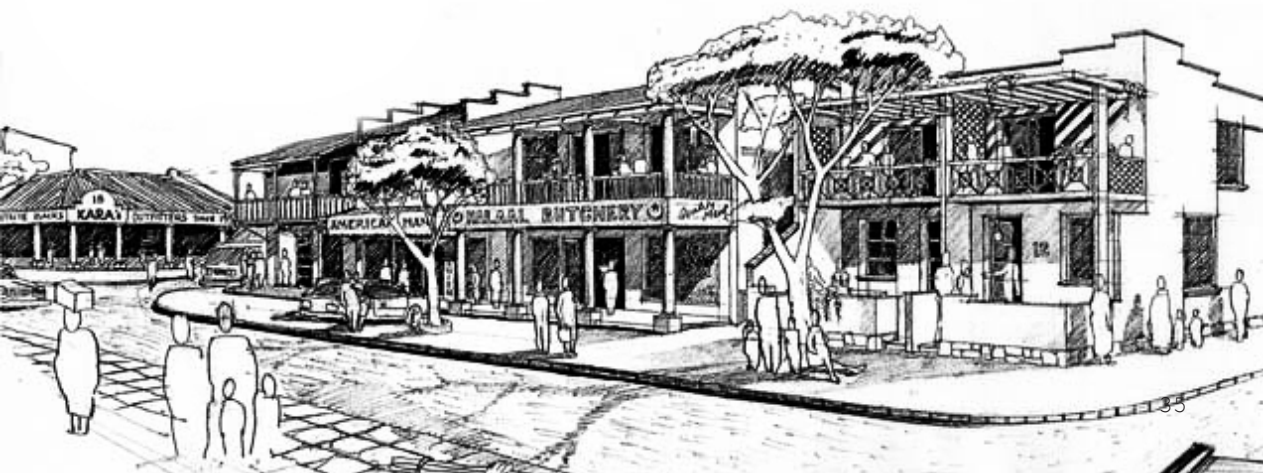
Residential development

The proposed Housing Development area within Marabastad (bordered by Seventh Street, Struben Street, D F Malan Drive East and the Cemetery) has the advantage of an inner-city location, close to places of employment. The housing development area permits establishment of several landparcels, to promote variety in type, appearance and spatial configuration of housing developments. Subsidised housing should be developed in the form of larger projects, variety should still be accommodated in the scheme to acknowledge Marabastad's ordering grids and fine-grained character. The area marked for residential development is seen as a transition zone between the CBD and Marabastad. It extends the existing housing belt of Schubart Park and Kruger Park into the Marabastad area, albeit on a different scale (Aziz Tayob Partnership, 2002:).

Figure 33. The proposed residential densification of Marabastad.

Figure 34. (opposite)
Sketch of proposed development of Marabastad

Figure 35. (bottom)
Sketch of proposed development of Marabastad



The area where Boom Street crosses Steenhoven spruit is a rectangular public open space, with edges defined by existing building fabric typical to Marabastad (Figure 37).

"This space attains a potentially charming character through the stream crossing it and the large estab lished trees in the space. Until the area was cleaned up, this was a favoured hawking spot, given the large volumes of pedestrian traffic crossing the space from the station en route to the city centre"
-(Aziz Tayob Partnership, 2002: 244).

Photographs of landmarks and places relevant to the chosen site.

1. Mixed-use buildings in Boom Street, Empire Theatre. Figure 37.
2. Steenhoven Spruit stormwater channel. Figure 38.
3. Informally appropriated land west of site. Figure 39.
4. Proposed BRT stop. Figure 40.
5. Boom St. with mixed-use buildings. Figure 41.
6. 11th St. with mixed-use buildings. Figure 42.
7. Electrical substation south of Belle Ombre train station. Figure 43.
8. Belle Ombre train station. Figure 44.
9. New informal trade market in 11th St. Figure 45.

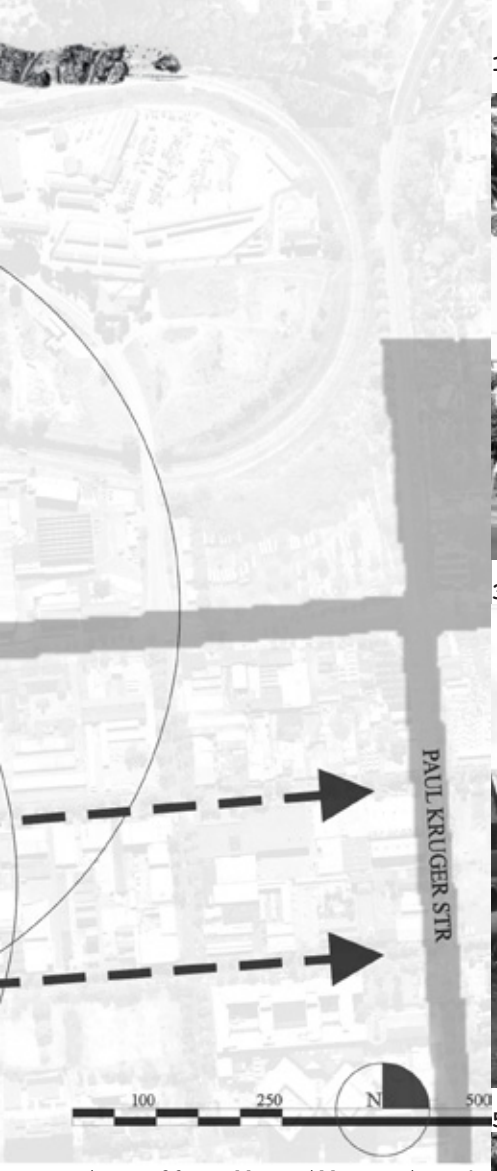


Figure 36. Collage illustrating the chosen site relative to context.

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The collages conceptually and experientially explore the relationship between people who use Marabastad differently, and the people to Marabastad itself. Commuters, residents taxi drivers and vendors are positioned in relation to one another and relative to Marabastad. The result is a fragmented use of the area, with little common ground between people. The social intent of the proposed programme is to provide a place of neutrality. This place is defined as being both physical, experiential and part of the ritual use of Marabastad.

The proposed intervention intersects the place and people within the context of Marabastad. The intended facility provides an opportunity to experientially and socially integrate Marabastad to the city. The site is the intersection between the pedestrian active Boom Street and the recreational atmosphere of the Steenhoven channel, and its proposed surrounding park. The channel represents the traditional eastern edge of Marabastad. The project positions itself in-between situations, with programme becoming integrator.

Figure 46. (opposite) Digital conceptual activity collage illustrating the people of Marabastad relative to each other and in relation to Marabastad.

Figure 47. Digital Collage with site superimposed the conceptual activity environment.

Proposal

On an urban scale, the project aims to initiate programme in the Steenhoven spruit corridor through a provision of infrastructure in the proposed act of altering the channel cross section as suggested by the Marabastad integrated urban design framework. This process follows strategies proposed by Alex Wall, of thickening, folding and providing for non-programmed use of and on the urban surface. These strategies allow for the manipulated urban surface to act as an instrument for unfolding new urban realities (Wall, 1999:245). Thickening of the surface allows for the urban surface to be serviced from below, increasing potential uses. Folding exposes greater surface area, while in the case of the proposed design, the natural water body is made accessible. By allowing for and anticipating nonprogrammed use, the surface can be appropriated by the public, enabling a diverse and flexible range of uses (Wall, 1999:245). The layering of infrastructure and natural water provides an introduction to the bathhouse, where the use of and interaction with water through service provision intensifies. This densification of possibility takes place on the proposed site, the crossing between pedestrian movement along Boom Street, and the natural water body, Steenhoven spruit.

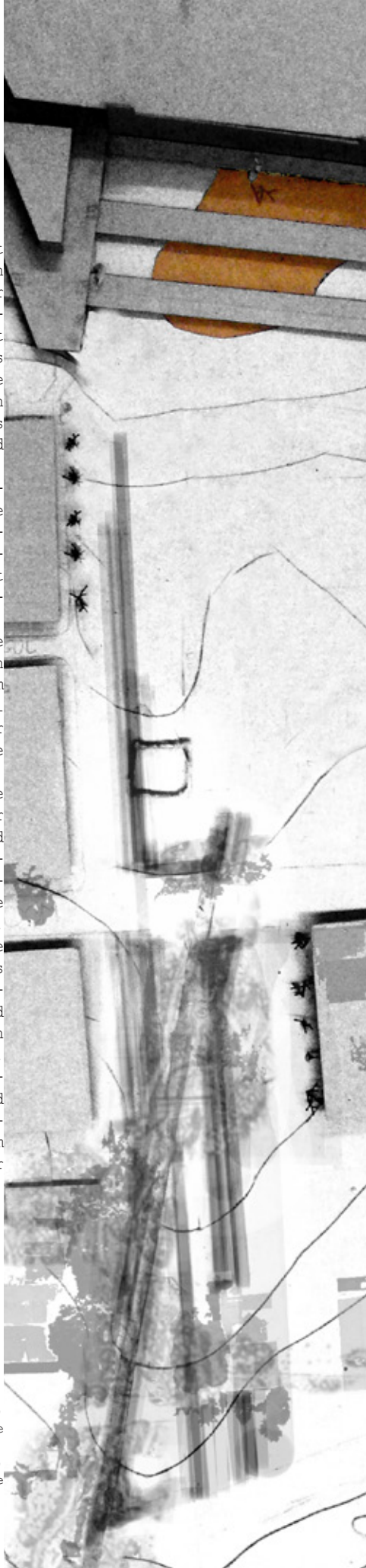


Figure 48. (left)
Site on digital collage

Figure 49. (right)
Manipulation of ground plane

Complimentary to the manipulation of the channel, a conceptual 'field' of shelter is superimposed onto the site. This system intends to act as translation between the park and the urban. By cutting away from, thickening and thinning the conceptual shelter based on the needs of programme, the bathhouse form is revealed. The intent of Heidegger is present, where he defines architecture as making places, indeed as bringing out that which is already there (Higgot et al, 2000:14).

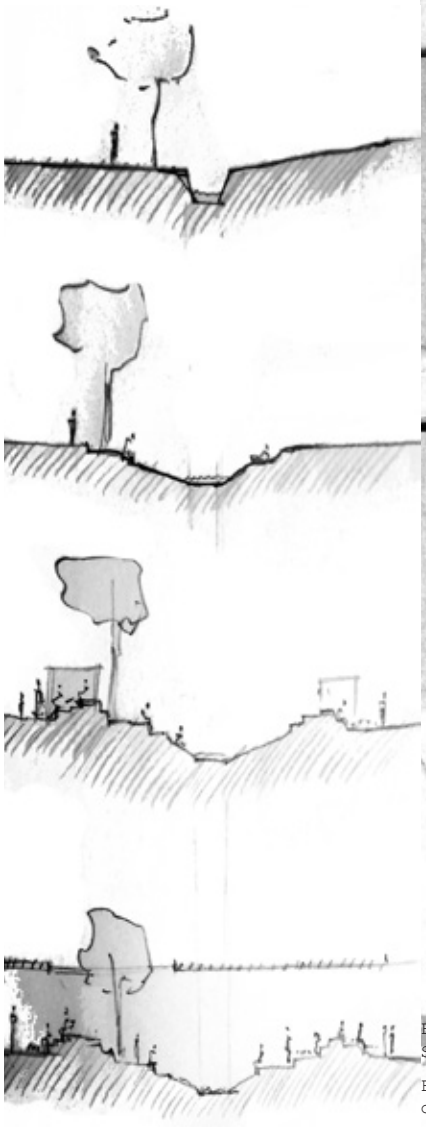


Figure 50. (left)
Surfave manipulation and appropriation.

Figure 51. 'field' superimposed onto site

03. Design development

Theoretical discourse

This dissertation proposes an investigation to establish the manner in which a public bathhouse would manifest in a South African urban context. The focus is on enriching and celebrating a daily ritual as a means of addressing the shortcomings of urban ablution as a necessary building typology. In a similar manner to which the programme in considered primary to human nature, the built form is to find roots in that which is primary to architecture. Informing the design process is a theoretical discourse exploring and celebrating this essence of architecture; the reality of a built artefact. The approach is supported by the statement that beauty must always grow from the realities of life (Higgot et al, 2000:14).

The investigation into reality implies that architecture is not merely the reduction of abstract thoughts into buildable form, but rather the creation of experience from the basis of the real, essential and tectonic nature of architecture. An exploration on multiple levels starts with exploring the requirements of a bathhouse and its implied essential ritual as root for developing spatial experience through physical composition of the artefact. With the ultimate goal as a return to the tactility of the tectonic in all its aspects; to a meeting between the essence of things and the existence of beings (Frampton, 1996:246).

According to Michael Benedikt this meeting of things and beings is realised when objects do not point to another realm, but rather when signs fall silent and conventional associations fall away. A time when one is not conscious of reference, allusion or instruction. Benedikt refers to these as times of 'direct aesthetic experiences of the real', that in the current media-saturated era it falls onto architecture to have this direct experience of the real at the centre of its concerns (Benedikt, 1987:4). The design manifestation of this concept draws from and elaborates the programmematic and pragmatic realities of the proposal.

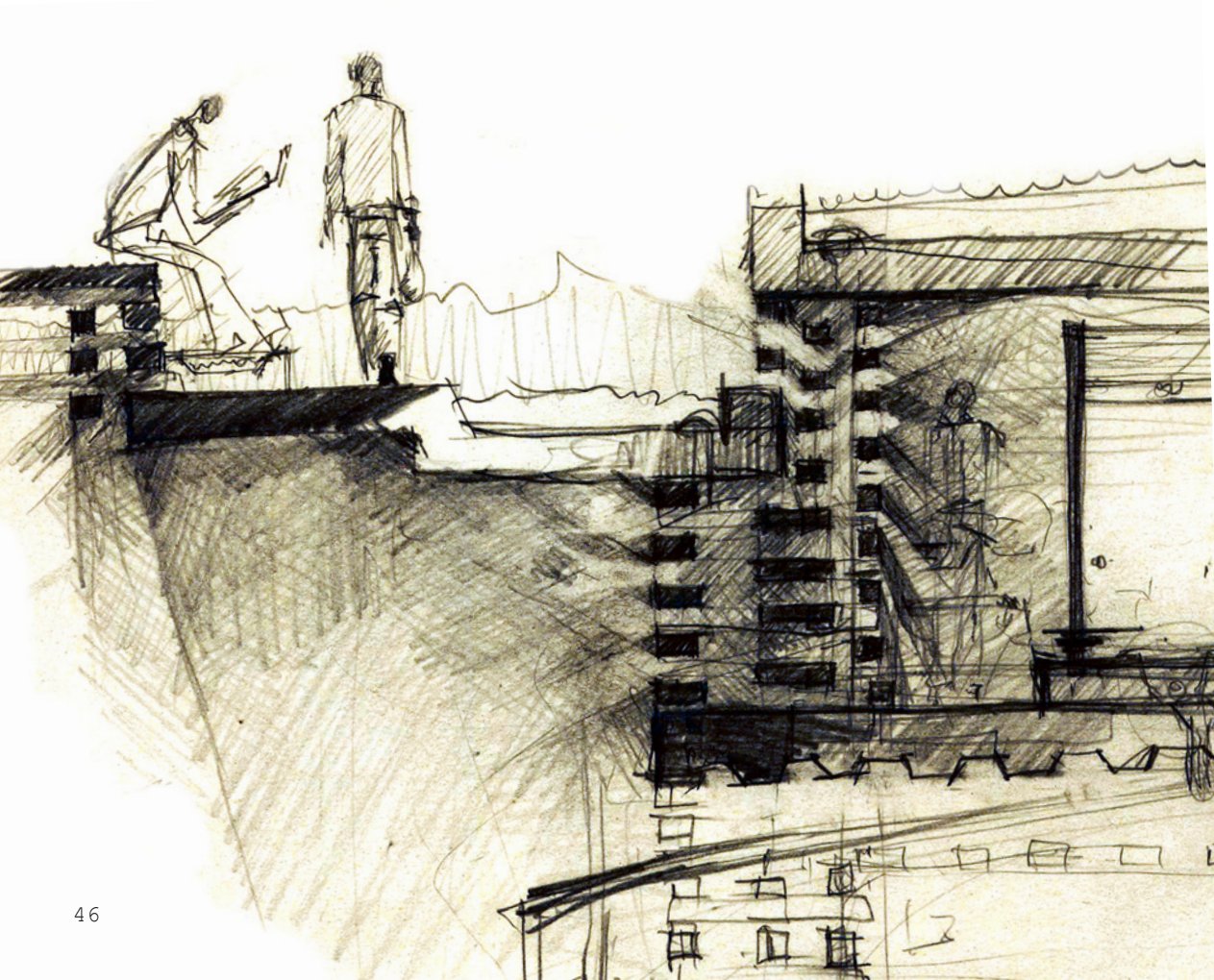
The implication is that architecture has its place in the concrete world, where it can make its statement (Zumthor, 2006:12), as a building being; and being experienced. Accepting the term 'building' as an integral part of architecture as an act and object from which architecture can derive legitimacy. Not founding architecture 'in some other discourse' (Grassi, 1980), but rather exploring within the realities of making and experiencing architecture.

An exploration of the essence of architecture, spatially and functionally, implies that programme, structure, skin, materiality and comfort, as functional requirements, act as sources and tools of inspiration, not unfortunate afterthoughts. Within this dissertation systems are encouraged to find roots in communal goals. Questions posed by the programme of a public bathhouse is used as origins for explorations. Thereby deriving poetic potential from the requirements for a typological investigation, through theory and pragmatic exploration, culminating in built form.

The goal of creating an architecture without pretence, as to encourage democratic access and use, implies that the design is not a sign representative of ideals, ancient or irrelevant, but is a utilitarian artefact. Through architectural exploration of inherent properties of the building, enrichment of the experience of users is envisioned, placing value in people and their celebration of a primary ritual.

The proposed building aims to be self-reflective, self-referential, dissolving the objective illusion of architecture, as referred to by Tzonis and Lefaivre (Nesbitt, 1996:488), to ensure a situation of subjective experience. The building thereby strives to exist, as Zumthor (2006:16-17) proposes, as a building that seems to be at peace with itself in a similar way certain objects, machines, tools or instruments are what they are. Through a celebration of inherent properties, these objects are not mere vehicles for an artistic message or channels for the implementation of technology; their presence is self-evident.

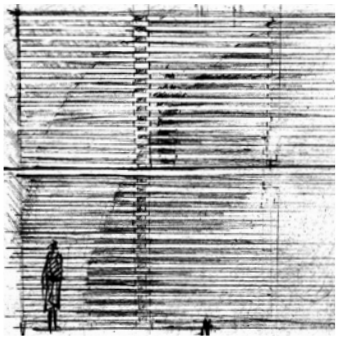
Figure 52. (opposite) Photograph of a conceptual model illustrating a skin explored and composed into a structural system that allows light and air to filter through.

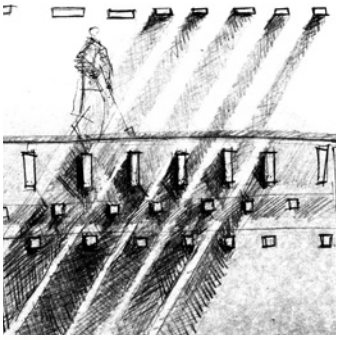


Exploration: structure and shelter

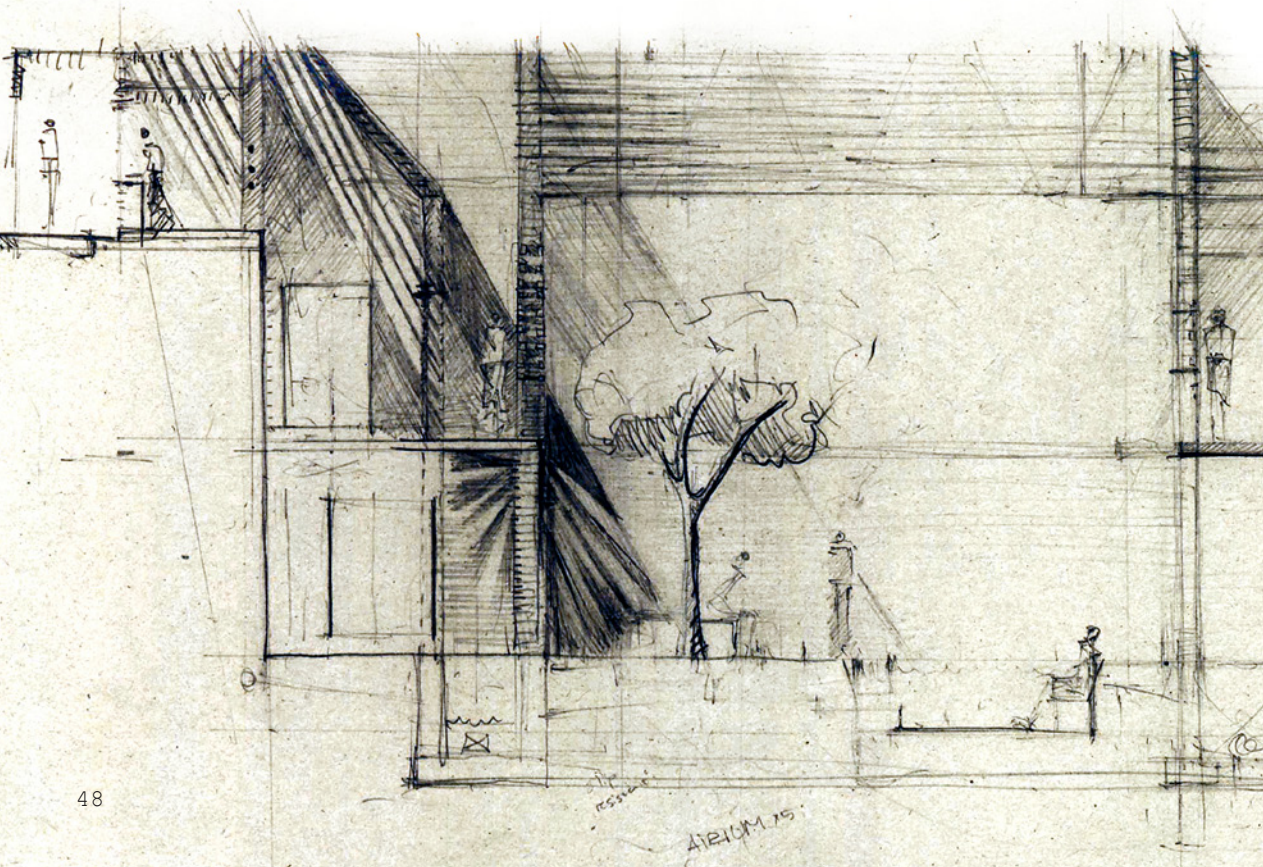
Parallel to programme, this dissertation explores the realities of architecture as generator and source of the manifested object and space. As a public building with a private programme, a means of achieving privacy, light quality and ventilation is proposed as a weaving of precast concrete beams. Originating from Framptons interpretation of Gottfried Semper's *Die vier Elemente der Baukunst* (Frampton, 1996:6), where the wall, *wand* or *mauer* made of masonry is considered a form of weaving. In this proposal the concept of weaving is employed as a translation from the stereotomic to the tectonic, capitalizing on the advantages of both systems. Through an exploration of membrane as a fundamental architectural source in support of the programme, structure is achieved, composing the building as a singular entity. Hierarchy based on structural and experiential requirements result in precast concrete beams translated into shelter as structure.

Figure 53. (opposite)
Sketch exploring light quality through a layered skin acting as structure to support slabs.





The act of layering permeable concrete skins establishes a hierarchy of privacy. Movement through the structure aims to manifest this layered concept seamlessly, resulting in deep edges. Circulation through the structure, the user is progressively sheltered. Ultimately Finding privacy below the natural ground level.



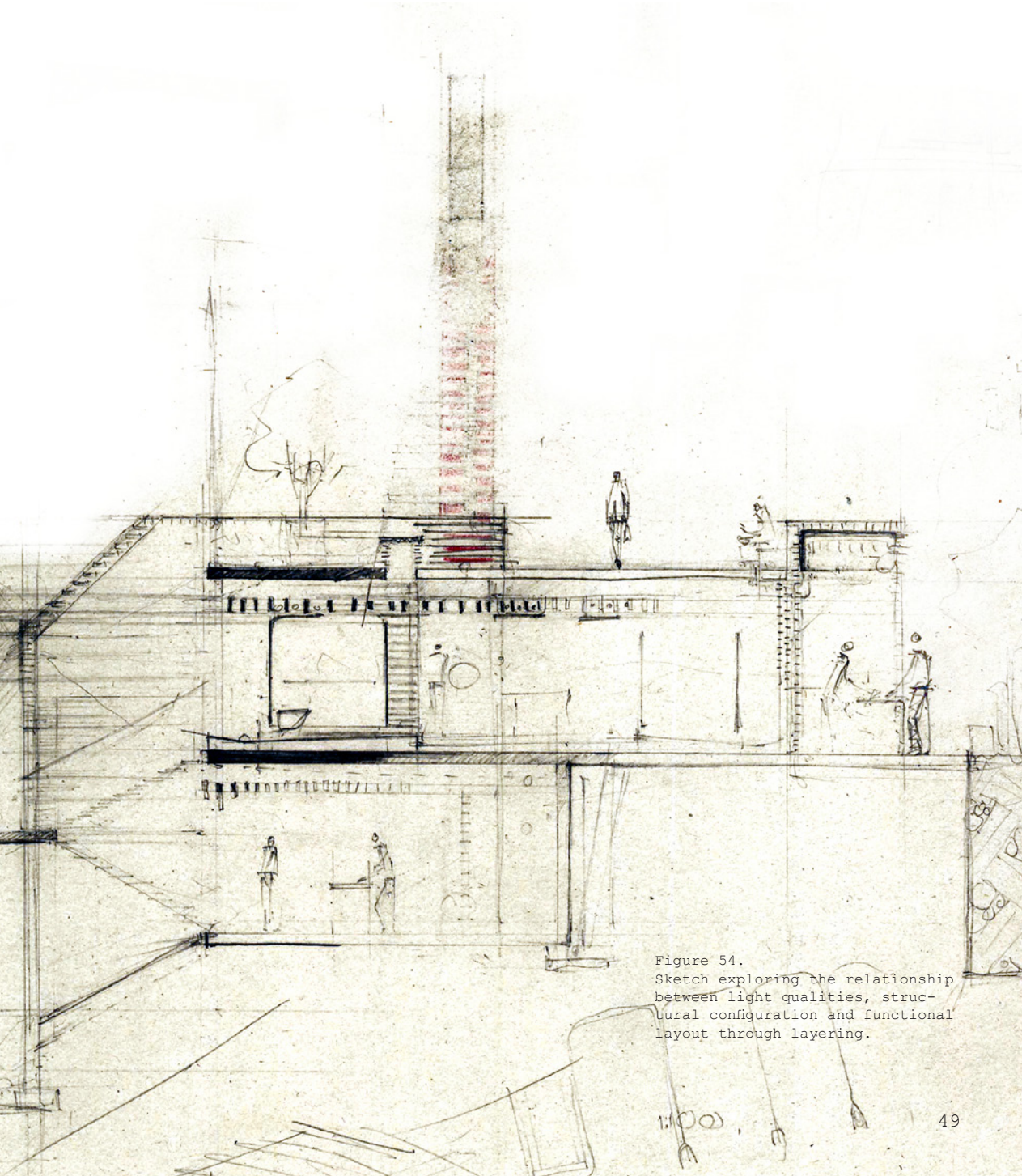
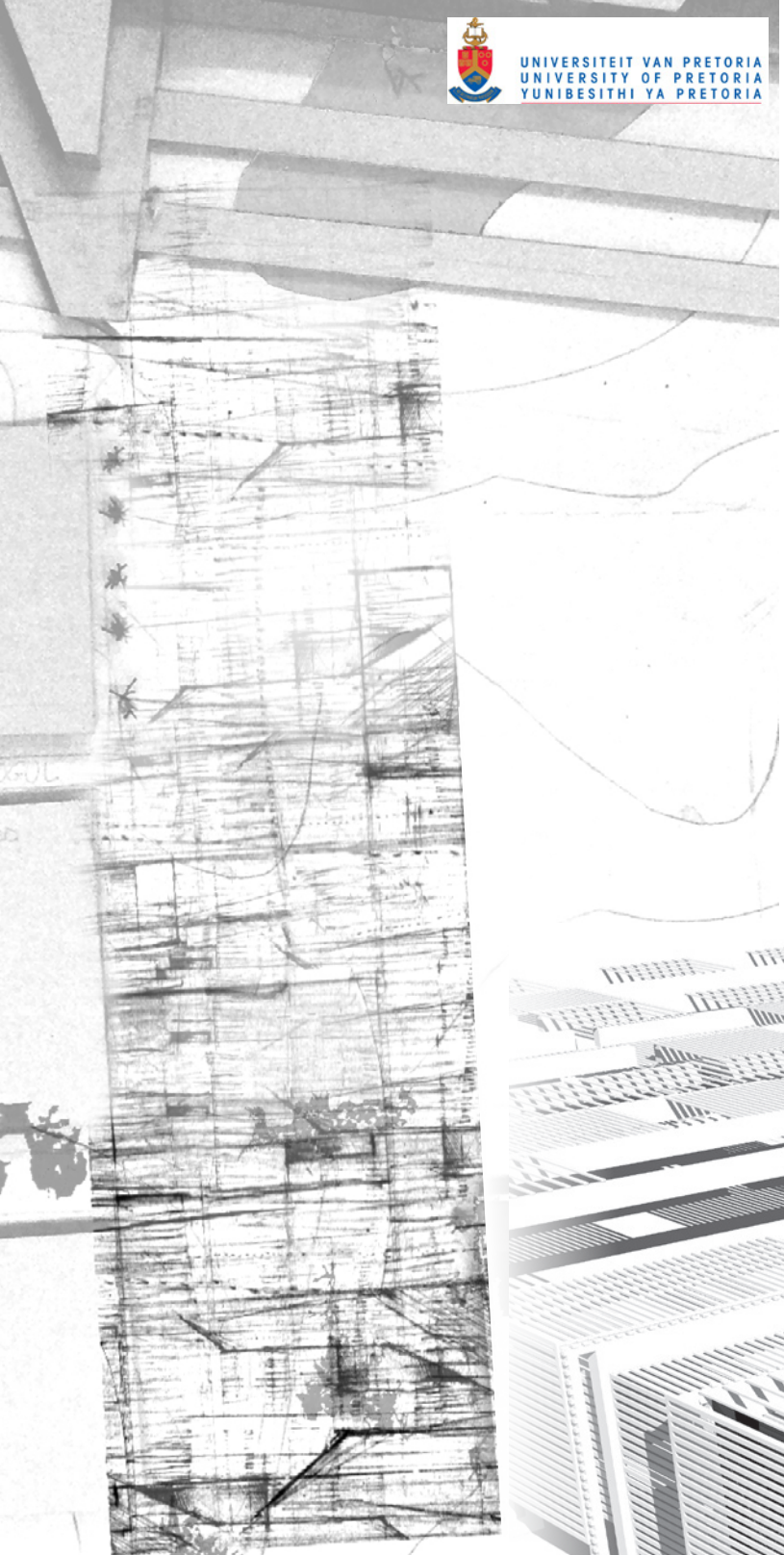


Figure 54.
Sketch exploring the relationship between light qualities, structural configuration and functional layout through layering.



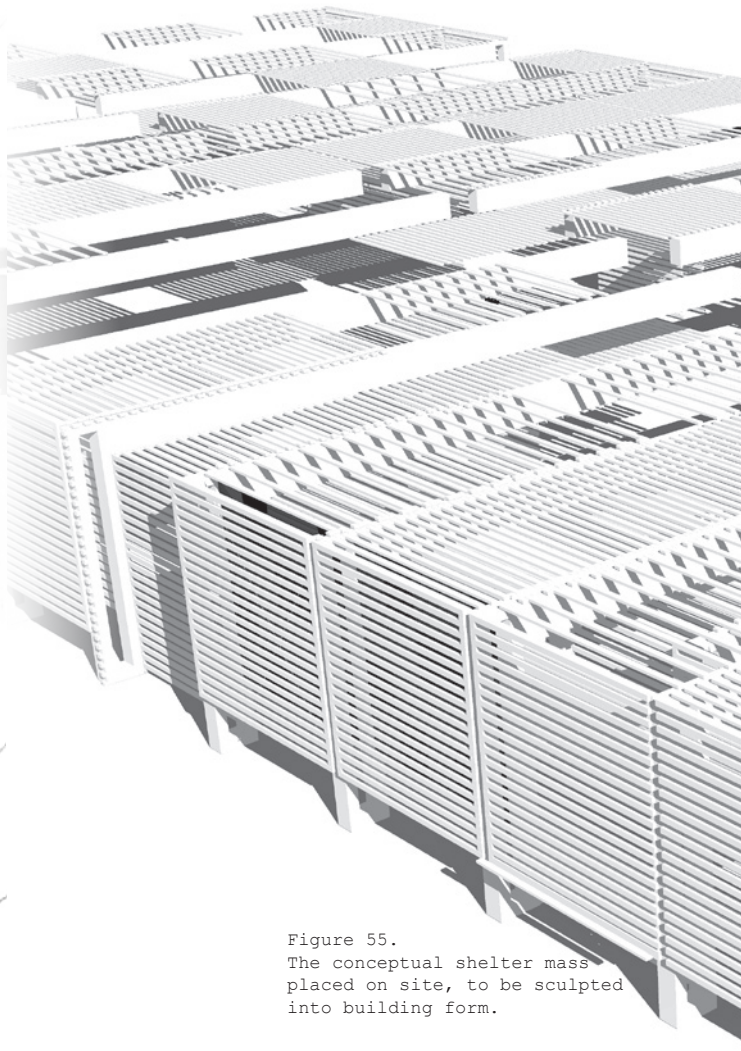
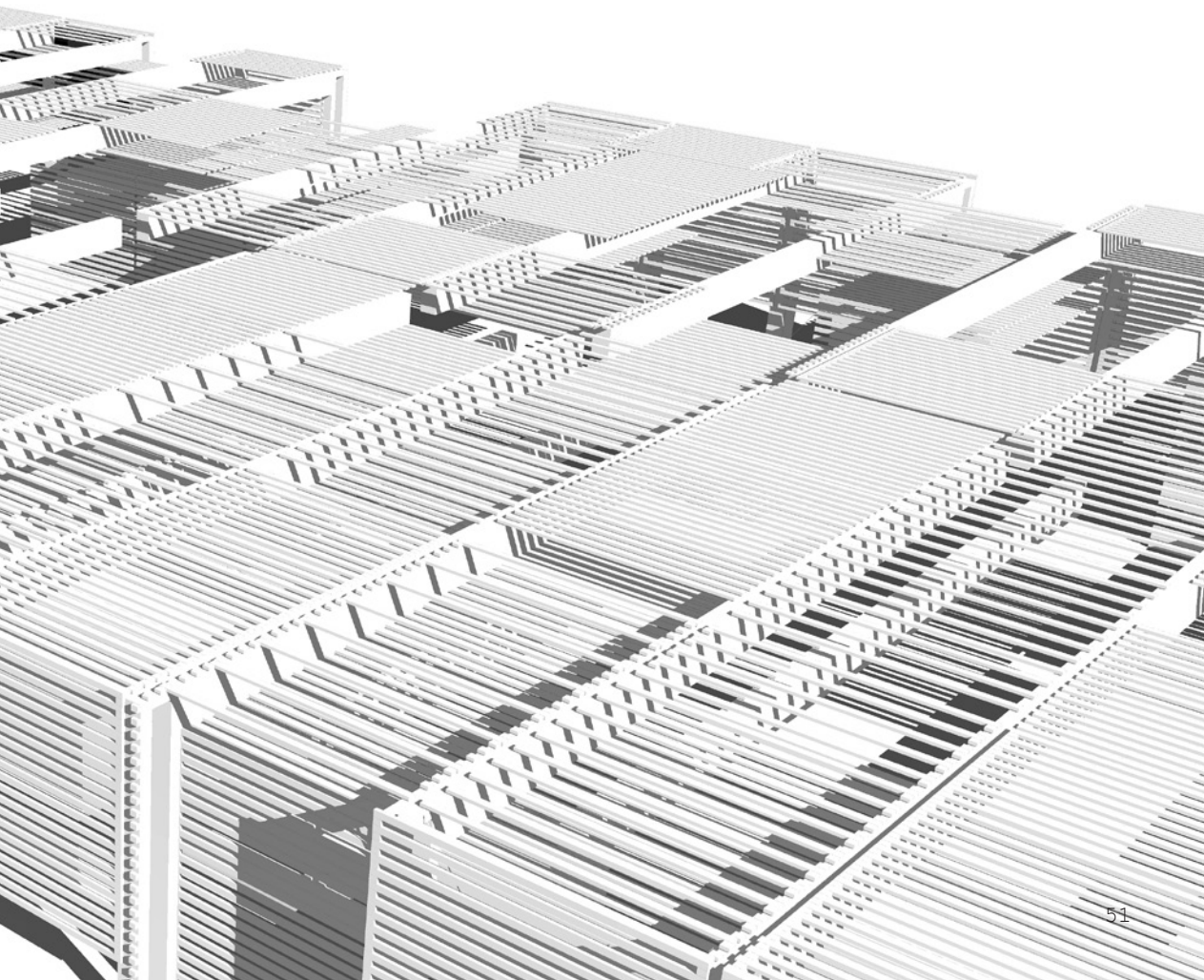


Figure 55.
The conceptual shelter mass placed on site, to be sculpted into building form.

The skin and structural system, as discussed, act as the conceptual field proposed on an urban level. This imposes a functional grid onto site, enabling the realisation of the building. Through a process of programming, thickening, thinning and cutting, the bathhouse is accommodated within the modified field. This design process allows for deep edges, as a hierarchical introduction to facilitate increasingly intimate spaces. This is achieved through said layering of permeable skins.



Exploration: Water, services and experience

'Once contained, water gives life, by providing something to drink, by washing wounds, by becoming the focal point of our activities. Within the realm of the man-made environment, water removes itself from the speculative and becomes both sensual and economic. It becomes a representative and structuring element. It can become one of four things: a point, a line, a pool or an edge. As such it becomes a point of gathering, a source of power, a place of culture and reflection or a place of limits and imagination. These are the four fundamental characteristics water takes in architecture.' (Betsky, 1995:9)

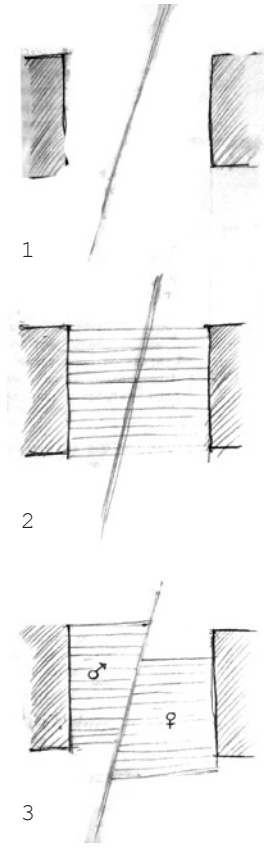


Figure 56. Sculpting of mass
1. context and channel
2. shelter superimposed
3. channel respected, legible gender partition generated

With the intent of the above statement in mind, infrastructure and services intended to deliver water are considered as unexplored opportunities, capitalizing on the economic, structuring and sensual properties of water. Exploring the potential of that which is fundamental to the building, service areas are designed to act as buffers between the public realm and private spaces, acting as spatial elements. This is achieved by wrapping the service areas around serviced, and consequently protected, private areas. These areas take the form of courtyards, as informed by the extensive use of courtyards at the Alhambra complex as places which contain water. The service areas are therefore capable of service inward and outward to the public surrounds. Projecting

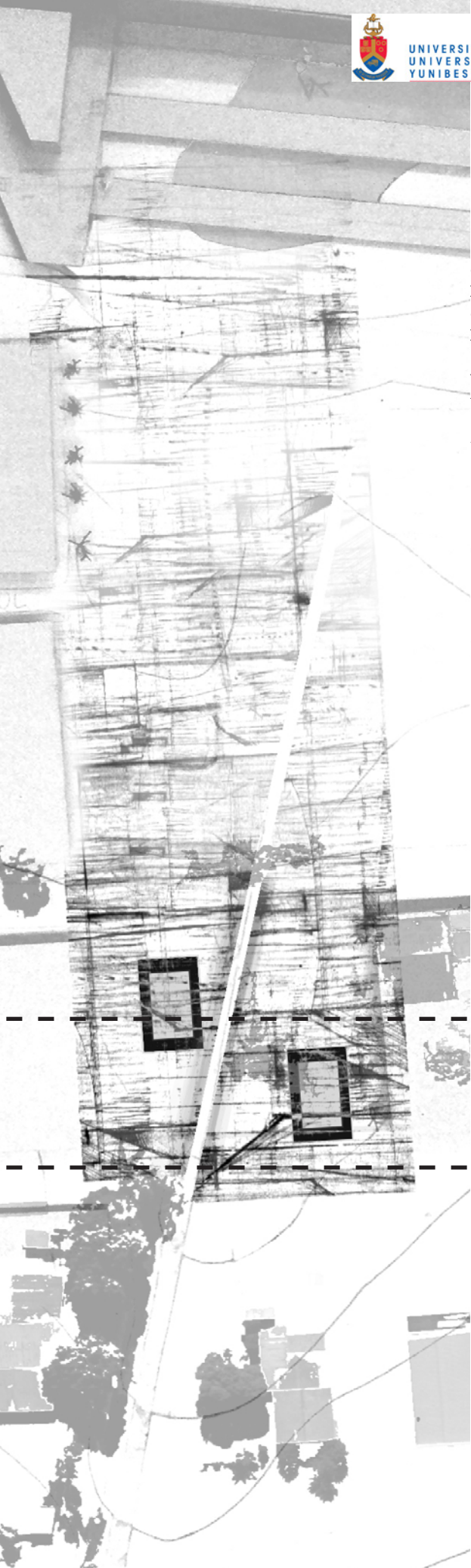
Figure 57. Aaron Betsky refers to the Alhambra as the locus classicus for the use of water in architecture, the manner in which water is introduced to a space, this point relative to movement through space and the extensive use of courtyards in the Alhambra complex informs the design process.

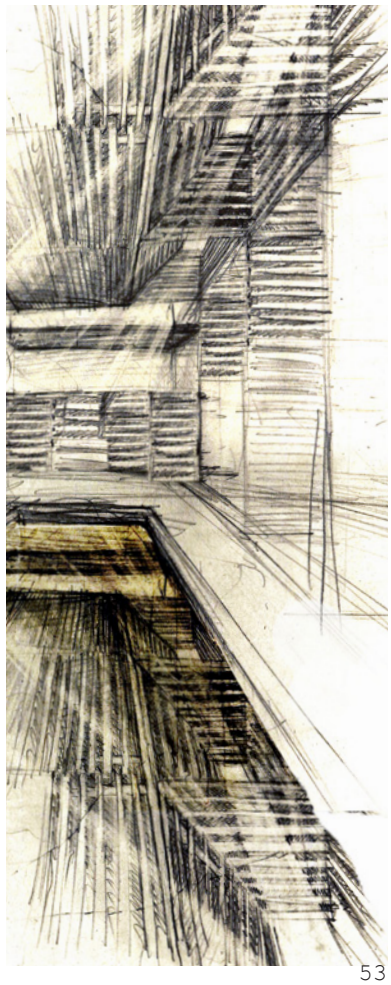
Figure 58. (opposite) Digital collage illustrating shift and courtyards.

Figure 59. (opposite right) Sketch applying courtyard principle to the design process.

the programme out and along the wrapping service areas activates the building edges through the use of water. Water becomes an edge, the level on which one engages with the building on the most basic level.

Water as a point of gathering is achieved when the role of the Steenhoven stormwater channel is expanded beyond its current use as infrastructure. Building on the channel as a local landmark, the manipulation of the site surface exposes and reconnects the natural water to the surrounding urban environment and people. The combination of landmark, infrastructure and place of gathering around the programme of a public bathhouse is intended, to build on the primal concept of going to the water to clean.





Exploration: Cross-programme and surface

As the site surface is manipulated, folded and serviced, the potential for informal appropriation of the area around Steenhoven spruit is envisioned. Informal trade, prevalent in Marabastad, is encouraged to infiltrate the facility. The surface aims to provide seating, shelter, storage and services in the form of electricity, water and light to encourage and facilitate hawkers. Services like shoe cleaning, hairdressing, clothes washing and repair in addition to general informal trade is envisioned. Products to be used within the public bathrooms and bathhouse can be produced and sold on site. This on-site production and additional formal trade and services, possibly a gym, restaurant, laundromat or clothes stores, are proposed to develop in the existing structures to the east and west of Steenhoven spruit. The deliberate presence of hawkers and trade throughout the site has the advantages of providing passive surveillance while an interest and market for local community and individuals is created. The social nature of the ritual of bathing is enriched by the presence of traders who provide a vibrant atmosphere.

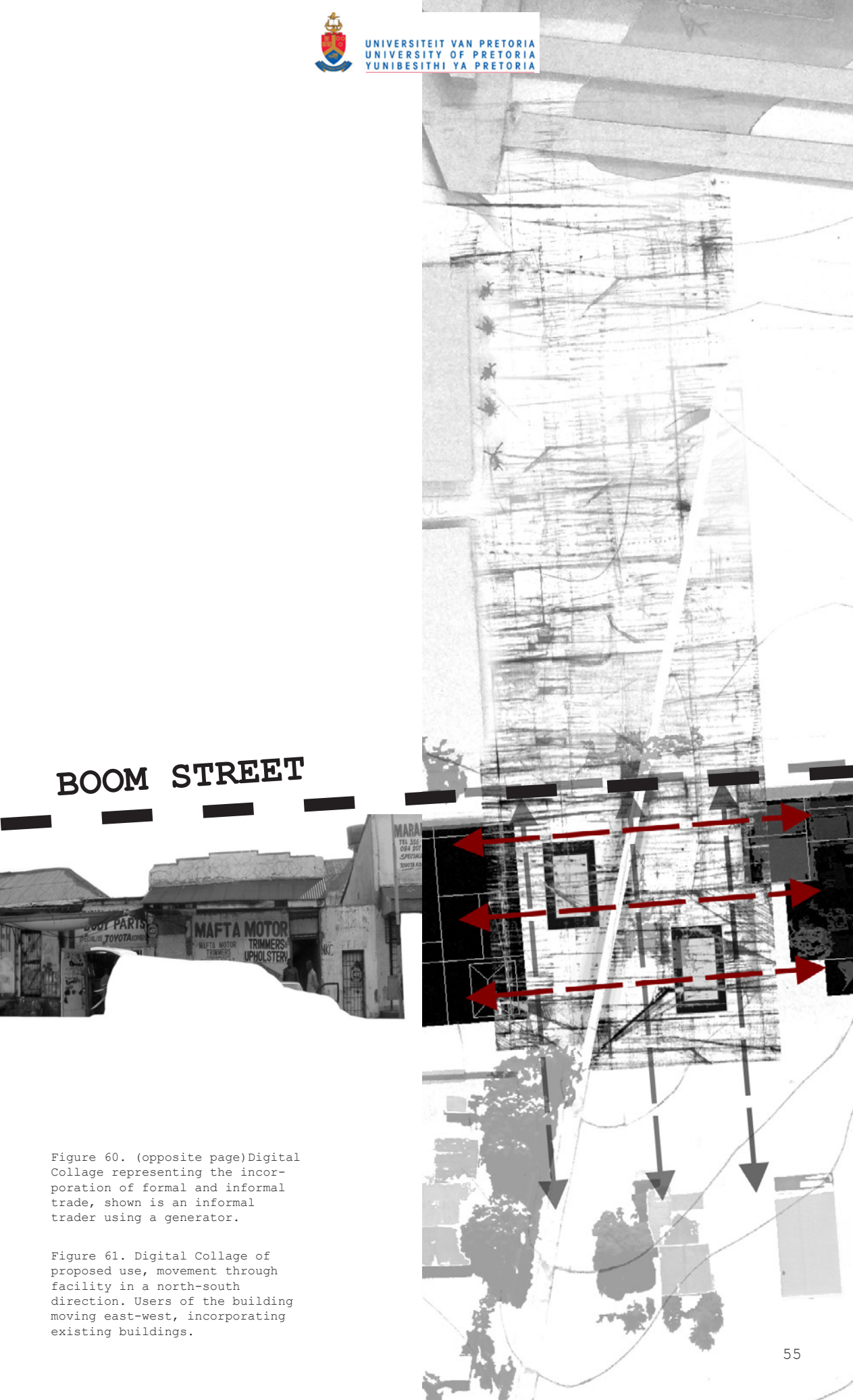
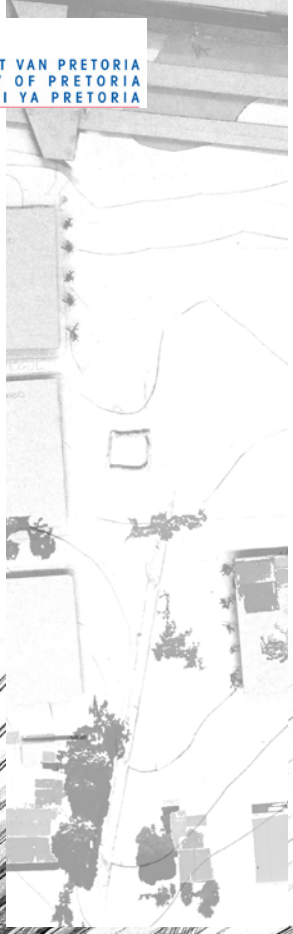
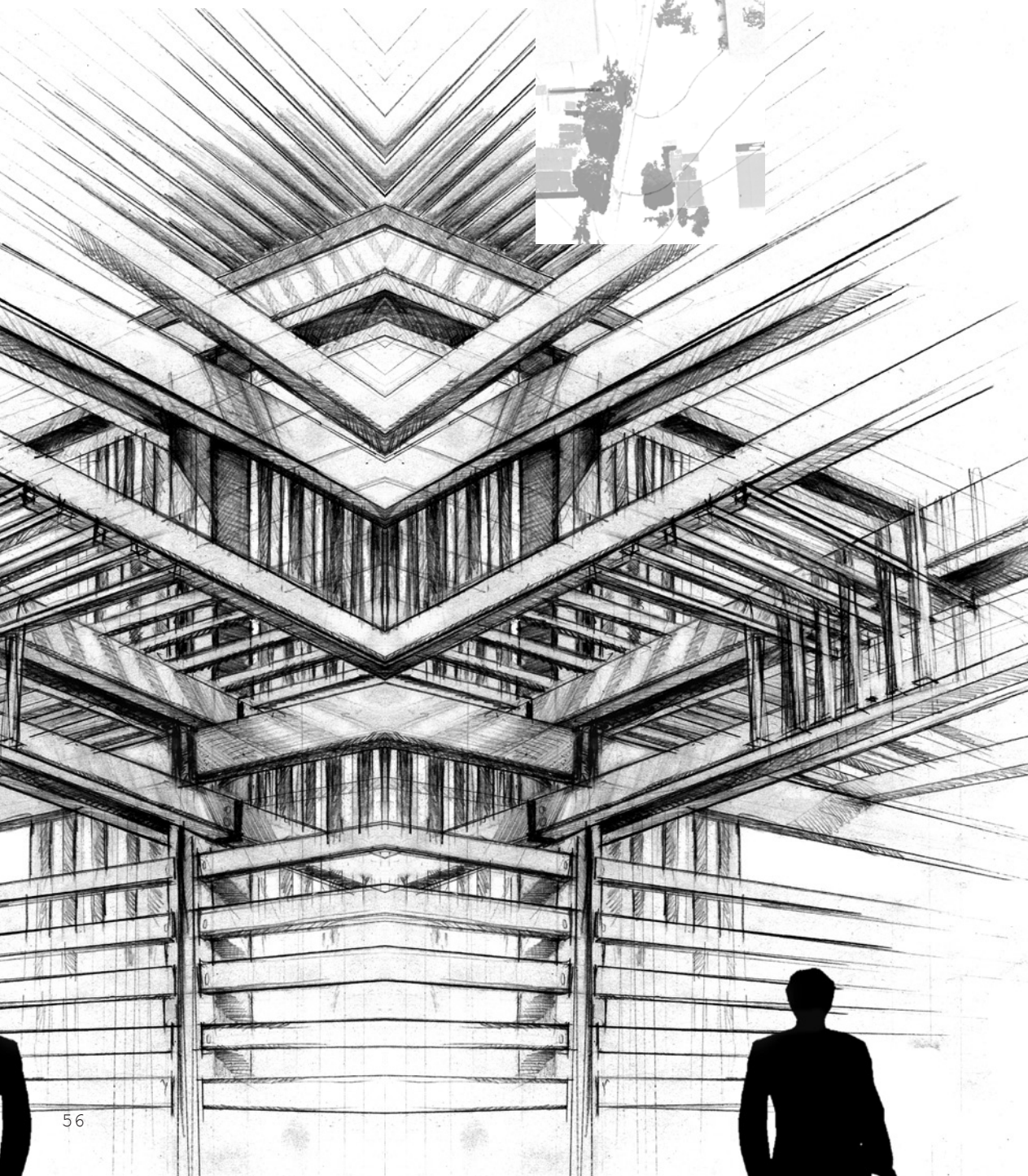


Figure 60. (opposite page)Digital Collage representing the incorporation of formal and informal trade, shown is an informal trader using a generator.

Figure 61. Digital Collage of proposed use, movement through facility in a north-south direction. Users of the building moving east-west, incorporating existing buildings.





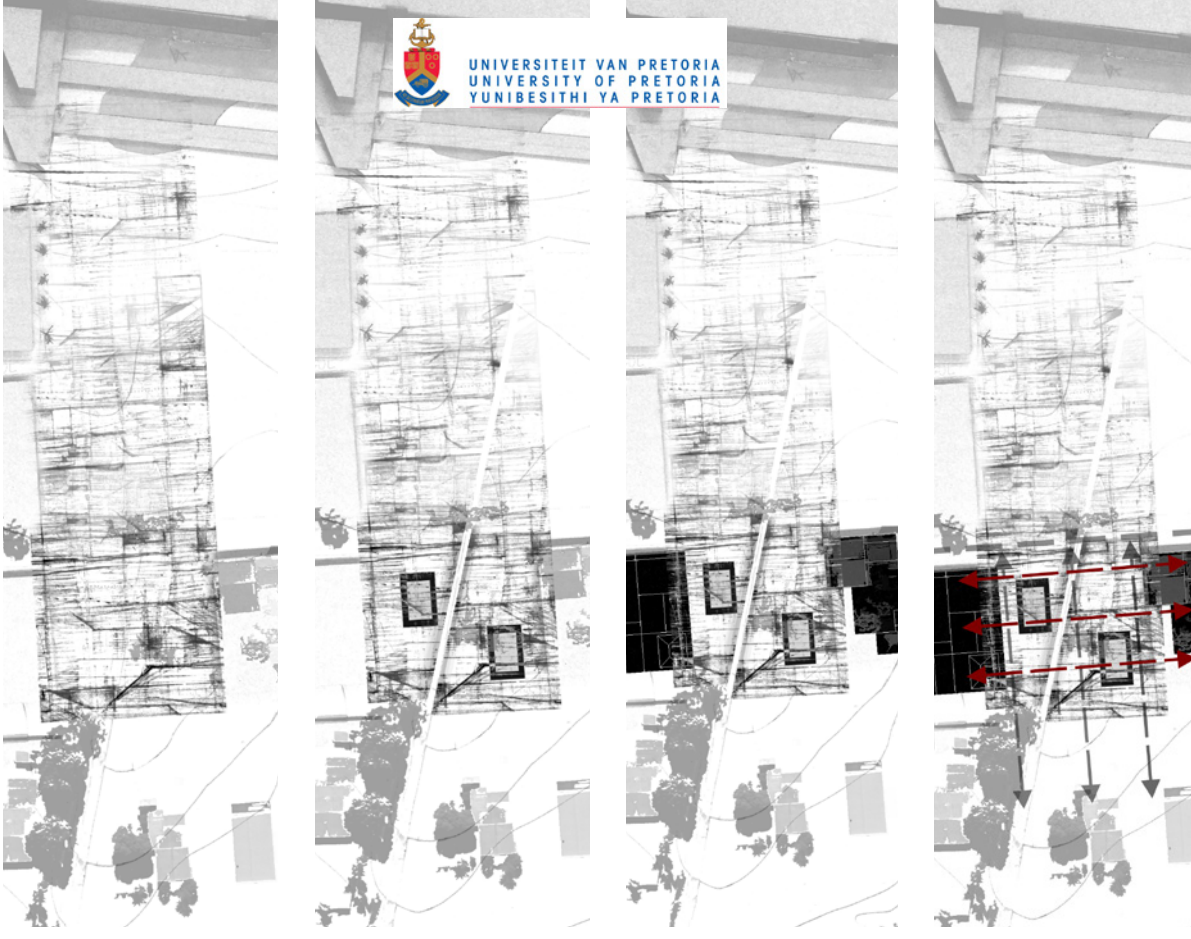


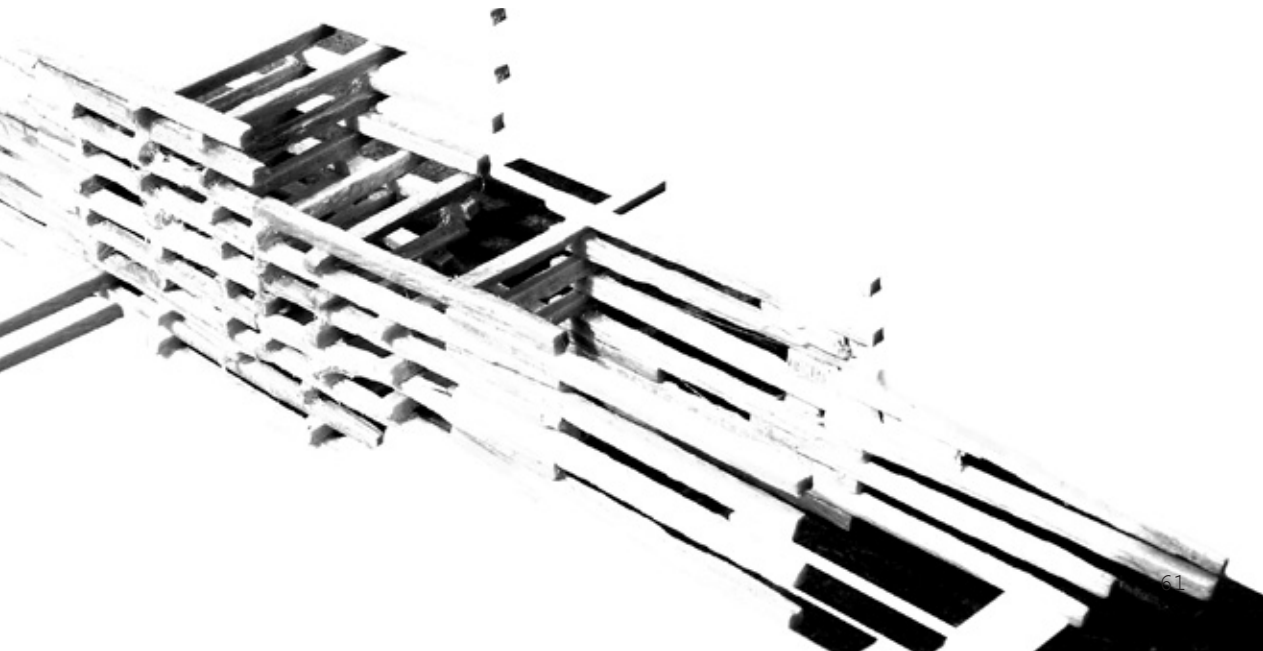
Figure 62. Digital collage of the conceptual design development process.

Figure 63. (opposite) An illustration of the structural system integrated with privacy cladding. A singular, permeable shelter is the result.

04. Technical development

Figure 64. Photograph of concept model, illustrative of an approach to technical resolution as a continuation of the design process.

The design concept manifests in three overlapping components, namely the surface, the shelter and their servicing infrastructure. These distinct components, rooted in their separate requirements and conditions, combine to generate the design. As such, each is investigated and technically discussed in principle, prior to their combination into realized form.

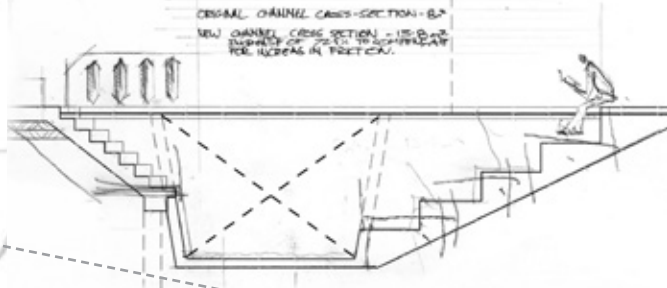


BOOM STRE

BLOED STREET

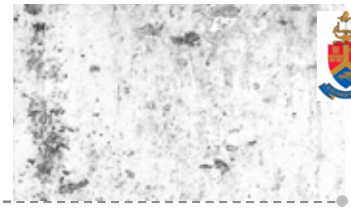
DET. AA

Any manipulation of the channel is to ensure that the cross-sectional area of channel is not reduced from its original nominal dimension of 8sqm.

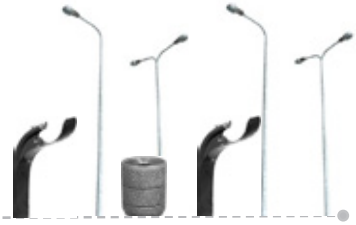


PLAN AND SECTION

illustrating the envisioned manipulation and development of the surface around the Steenhoven spruit stormwater channel. nts



lines the channel walls, giving way to green areas.

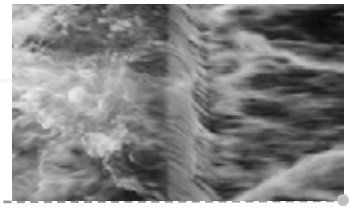


Services provided along the channel edge include water fountains, lights and rubbish bins.

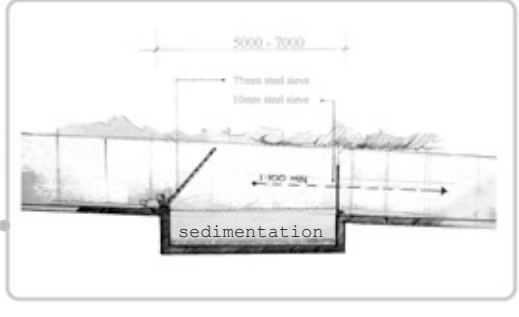
Surface

The manipulation of the urban surface aims to celebrate the experiential potential of infrastructure. Exemplified by the storm water channel being reestablished as natural entity while retaining its ability to function as a conduit of storm water.

Public seating, both in terms of the surface and benches are provided.



Materiality:
Water flowing down the channel becomes animated, creating white noise while celebrating water visually.



Detail AA, nts.
Debris traps to be placed at intervals along the channel development. Ensuring high visual quality of water throughout.

Figure 65.
Site plan and channel section. nts.


UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
BOOM STREET
GRAND STREE
BLOED STREET

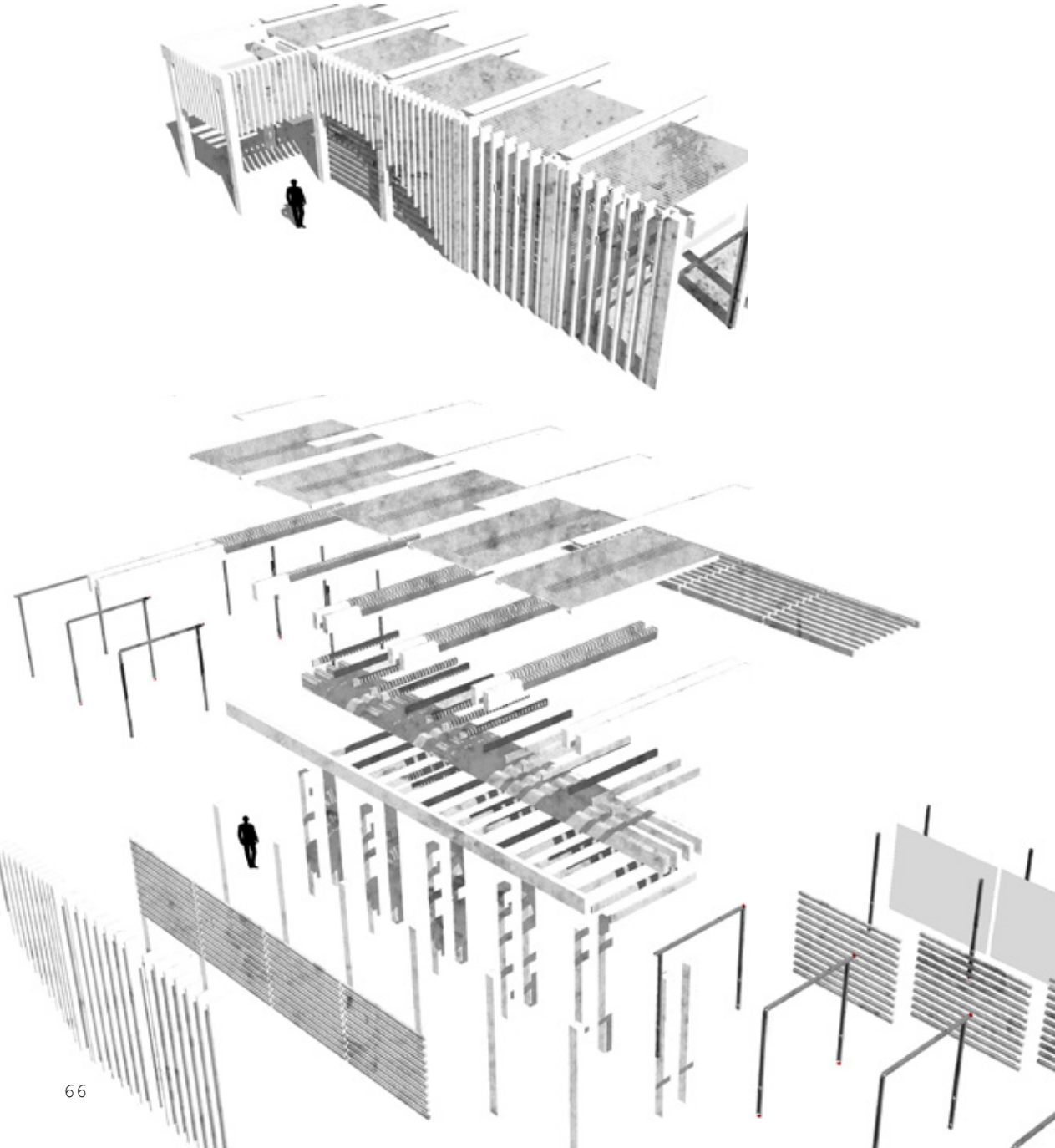
Figure 66. (opposite) Site plan.

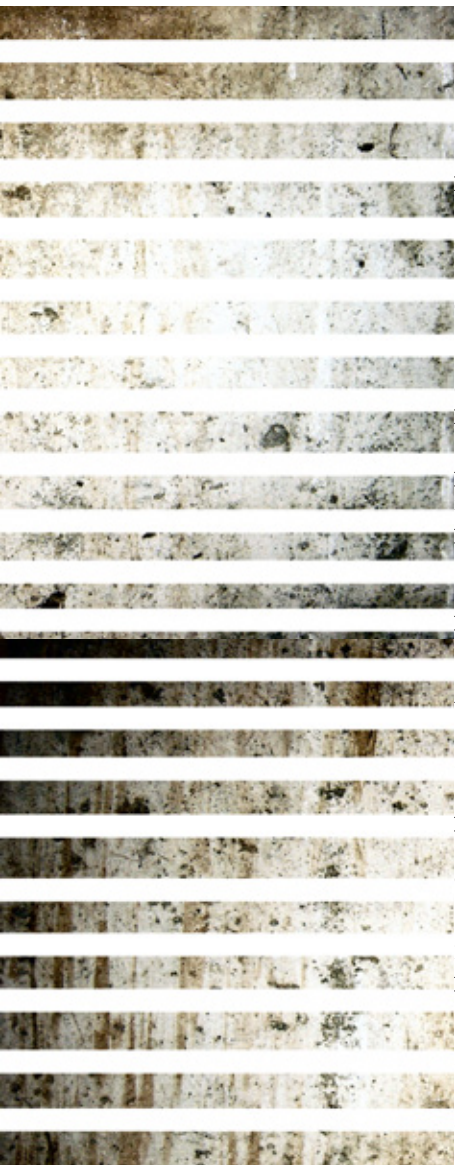
Figure 67. Conceptual sketch of bathhouse and manipulated ground-plane, as experienced from the south.

Figure 68. (opposite bottom) Diagram illustrating the pre-stressed, precast concrete process.

Figure 69. (opposite top) Materiality: Concrete

Figure 70. A model of part of the shelter, composed and exploded, illustrating the manner in which the components of the shelter combine. The composed model illustrates the system manipulated to provide legibility, an entrance is defined.





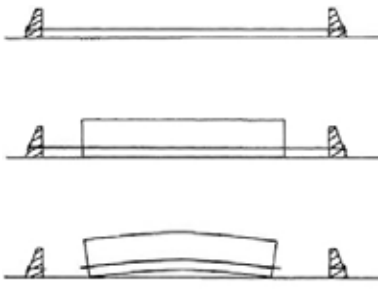
Shelter

The shelter consists of several parts: the structural matrix, a louvred roof, glazing and a system of steel frames for fittings. These components combine to form the superstructure of the building. The inherent properties of the shelter concept is manipulated in service of programme requirements.

Structure

The structural system employed to realize the design is intended to act as a fundamental part of the experience. The structure directly results in the building, acting as structure and shelter simultaneously. Understood as a weaving of modular, precast and prestressed concrete structural components, a three-dimensional matrix of interrelated parts combine to form the building. This interrelated nature ensures structural stability of the system through lateral bracing throughout. Concrete, precast and in-situ, fulfils many of the requirements of programme and structure. Concrete is durable and robust, intended to resist any physical abuse to which the building might be subject to. Concrete resists weathering, while maintaining structural integrity, vital when considering the presence of moisture implied by the programme. Finally, the physical mass of concrete allows for a measure of thermal comfort control through mass dampening of exterior temperature fluctuations.

Large structural prestressed concrete components are premanufactured off site to ensure quality control and structural integrity. These components are not small enough to be manufactured locally and are transported to be assembled on site. Smaller prestressed concrete elements are to be manufactures on site or within Marabastad using a robust process of prestressed manufacture (Figure 67). The intent is to establish a local industry and skills and production. The principles of precast concrete manufacture can be applied to the proposed densification and development of Marabastad in the near future. This proposed process consists of (Bruggeling et al, 1991: 5-6):



- Cleaning moulds
- Pretensioning, laying of reinforcing steel
- Concreting, vibrating, compacting
- Finishing
- Curing
- Prestressing by detensioning the moulds
- Cutting of protruding prestressing steel
- Demoulding and storage.

The intent is to expand the social potential of the bathhouse by capitalizing on the construction process.

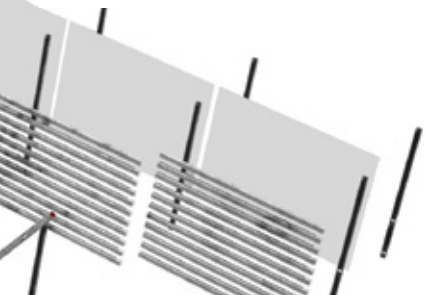
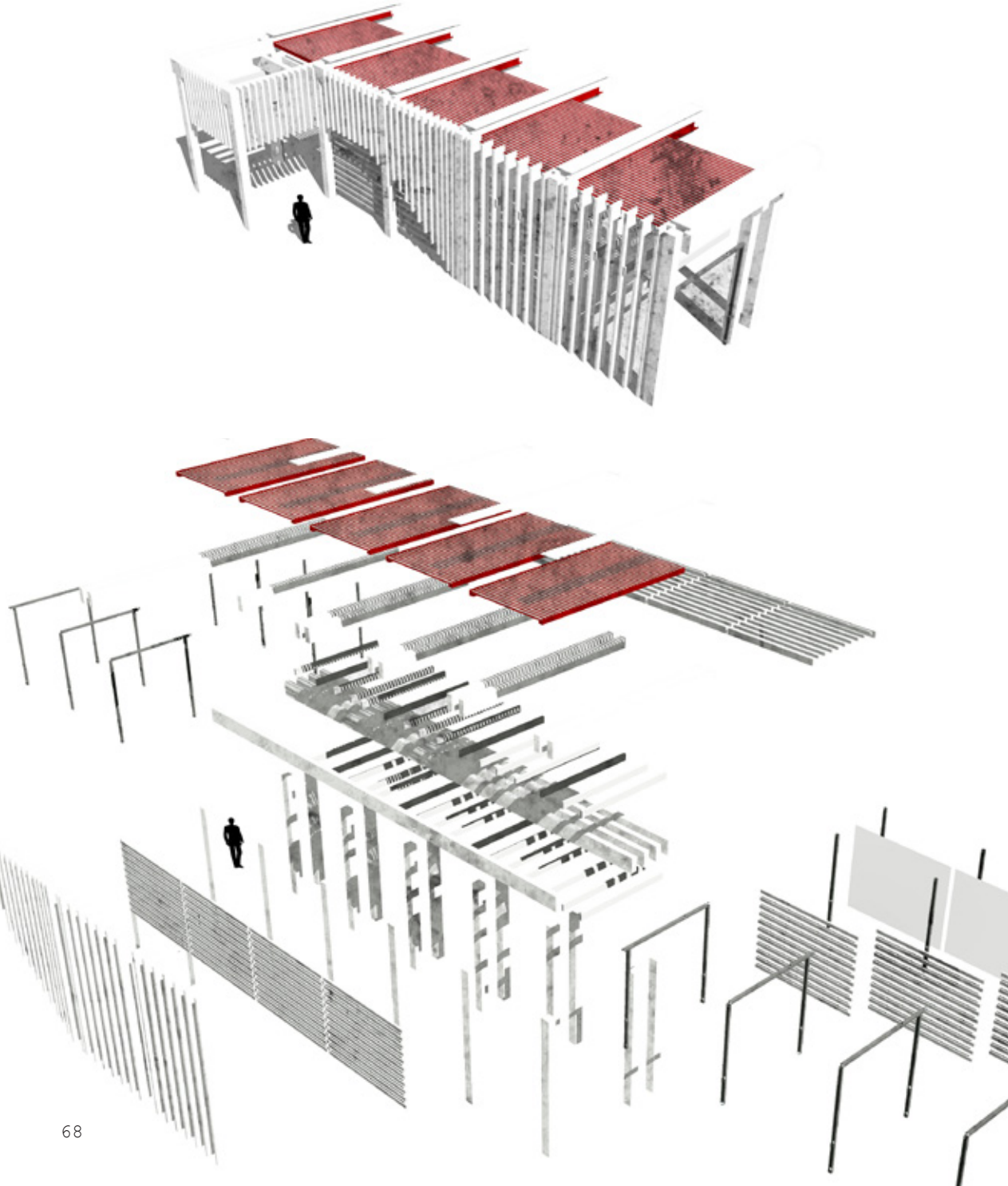
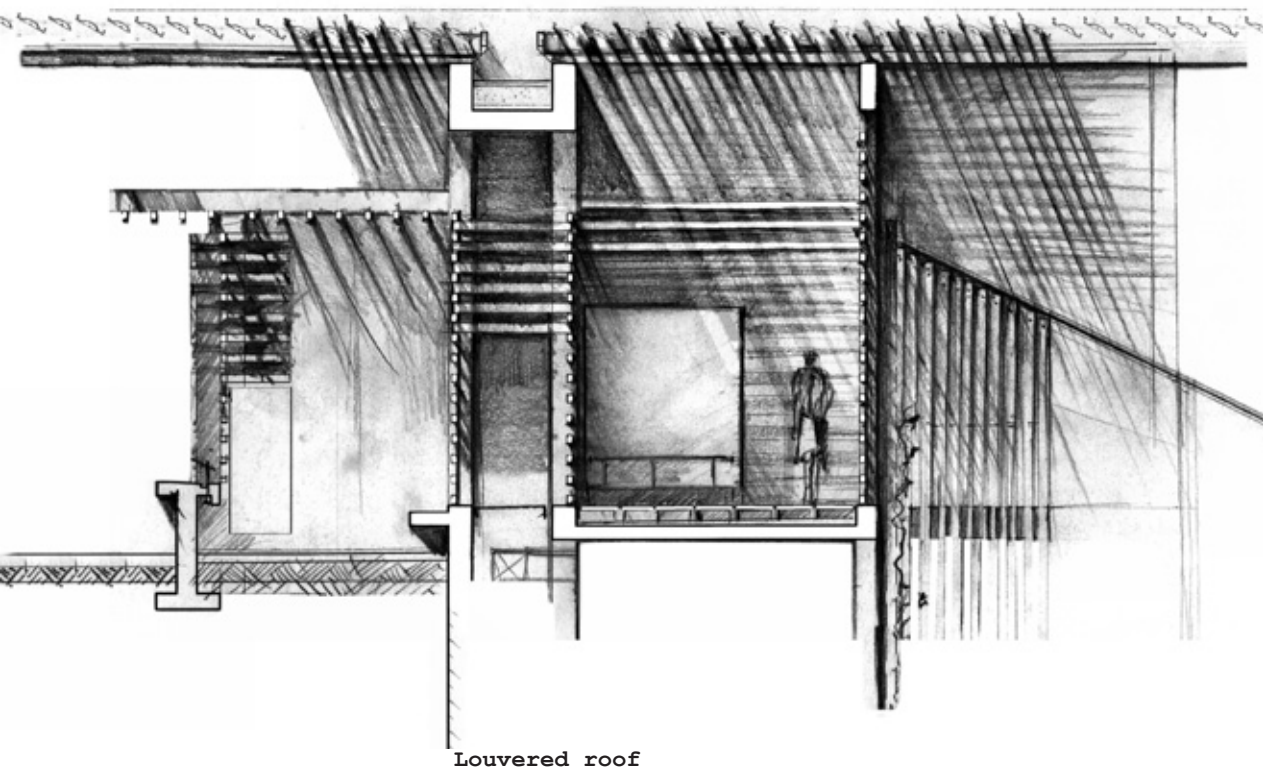


Figure 71. (opposite top). An exploration of the spatial implication of the chosen roof system.

Figure 72. (opposite bottom). The louvred translucent opening roof system in detail, indicating automated motor to be connected with solar and rain sensors.

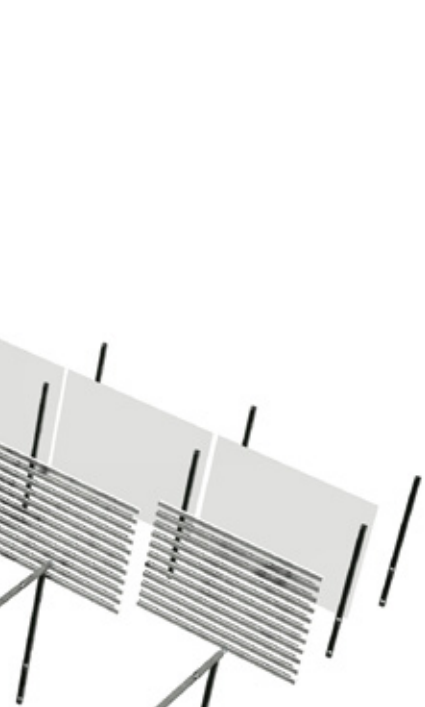
Figure 73. (below).Composed and exploded diagram illustrating the roof system relative to the rest of the shelter construction.

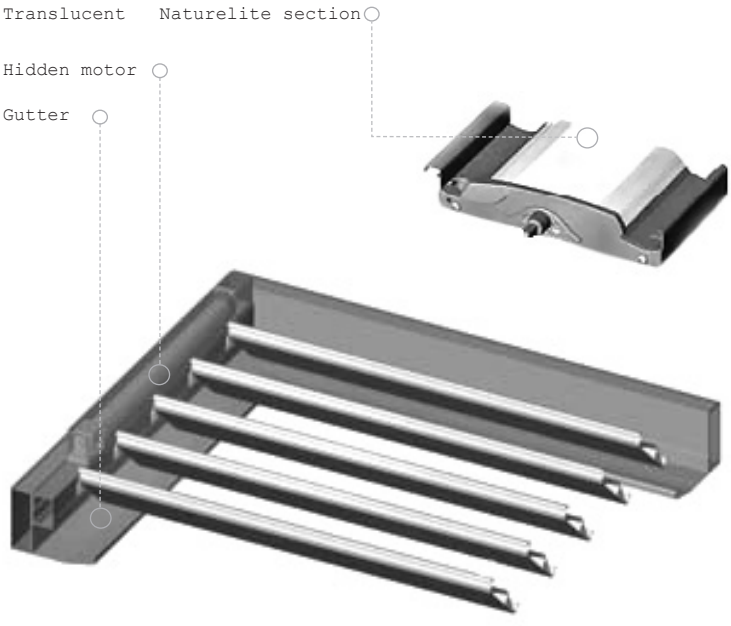


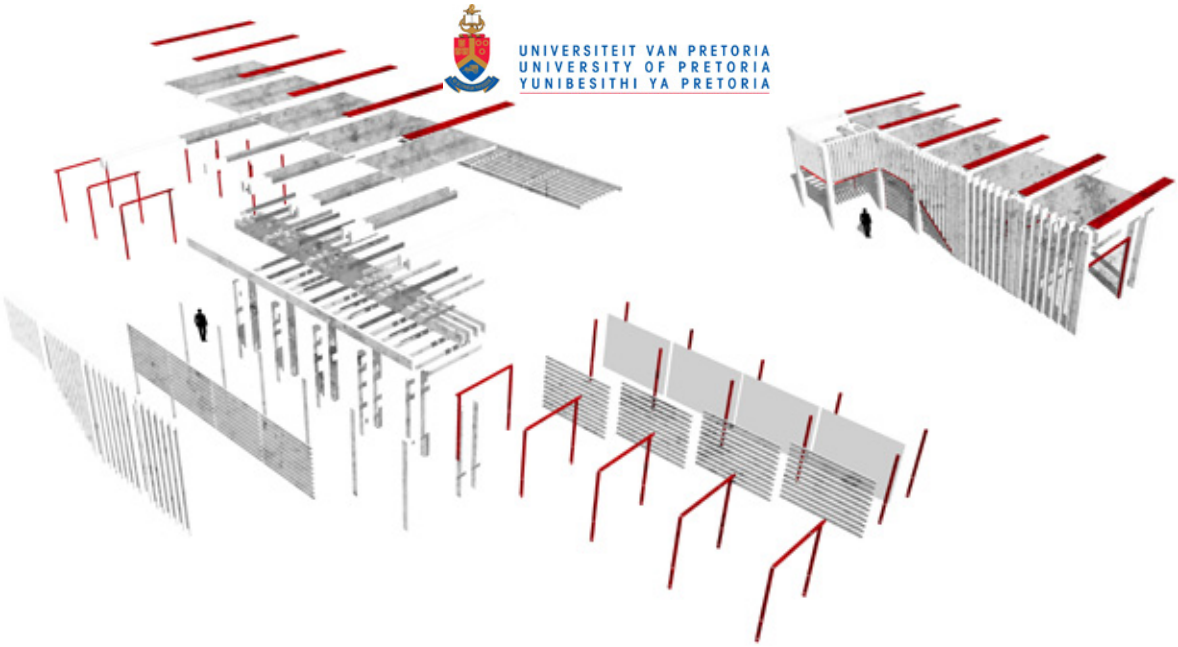


Louvered roof

A premanufactured aluminium opening louvre roof system is proposed. The louvres close and interlock, creating a weatherproof roof. When closed, a translucent UV treated Nature-lite panel in the louvre admits light through. The louvres have a 180 degree range of motion, managed through a hidden motorized pivot system, this motor can be connected to a sun and rain sensor and be fully automated (LouvreTec, 2009:9). The lightweight aluminium louvres resist heat gain, while shading or exposing the concrete mass from and to the sun.







Non-structural support system

The intent of the steel infill is to act as a system for housing various necessary fittings, while acting as a finish and support to the concrete construction. Glazing frames are connected to the steel support structure, setting these back from the concrete shelter. Lights, ducts and various other services and pipes are fixed to the fine grain steel structure, ensuring access to and adaptability of these systems. Steel construction is shop welded and galvanized before assembly on site to ensure corrosion protection.

Figure 74. (top)
Composed and exploded diagram illustrating the steel support system relative to the rest of the shelter construction.

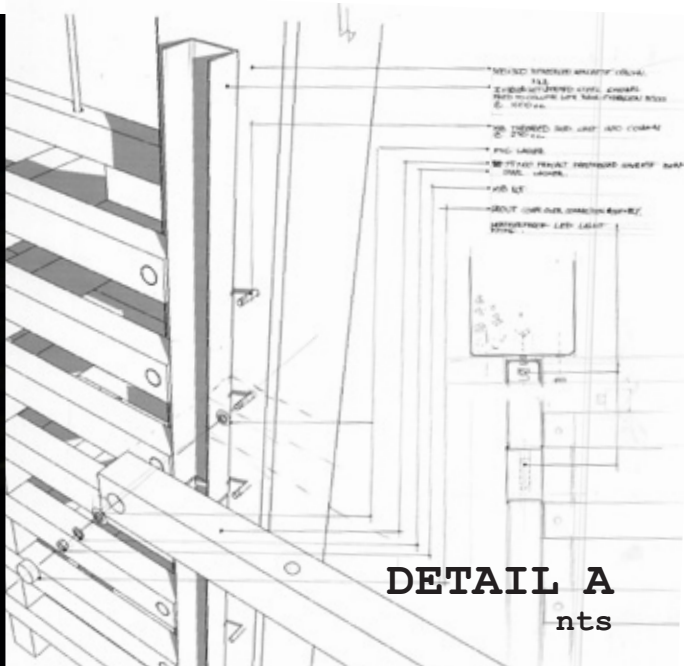
Figure 75. (opposite top)
Composed and exploded diagram illustrating glazing relative to the rest of the shelter construction.

Figure 76. (below left)
Render of LED Light fitting in steel supports

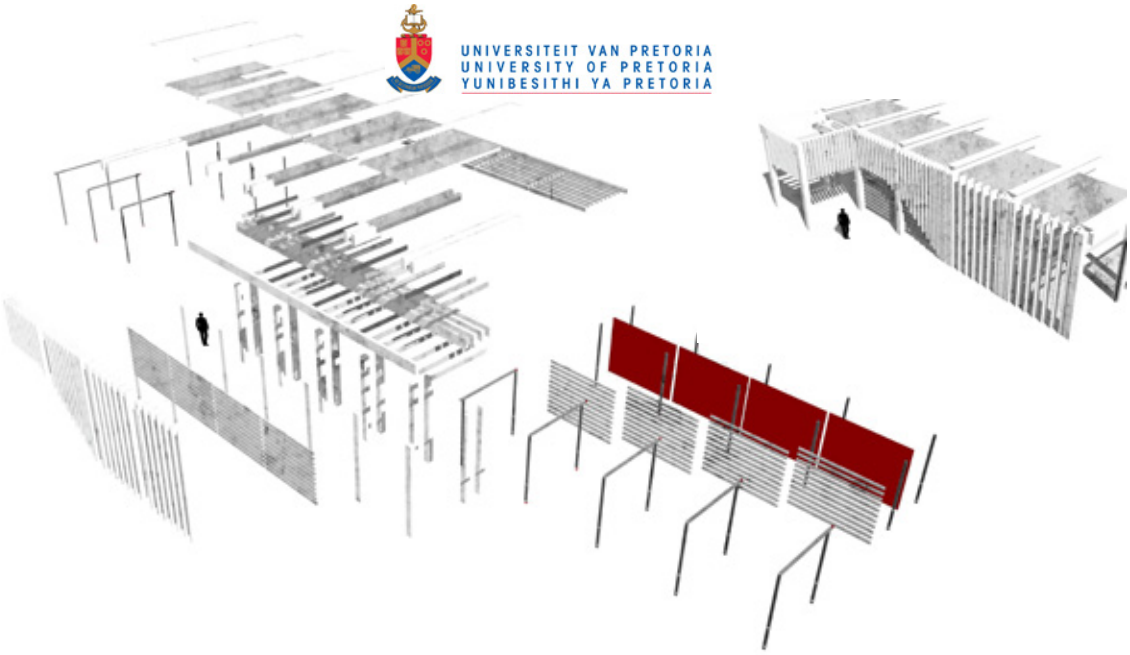
Figure 77. (below)
Detail A. Horizontal precast beam to in-situ column connection

Figure 78. (opposite left)
Detail B. Shadowline parallel to steps in concrete, created by steel support system

Figure 79. (opposite right)
Heavy duty precast concrete palisade fencing as a construction precedent

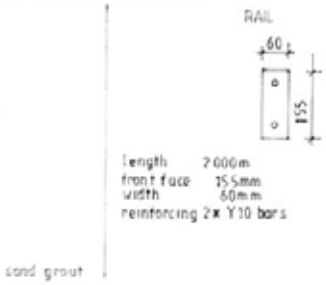


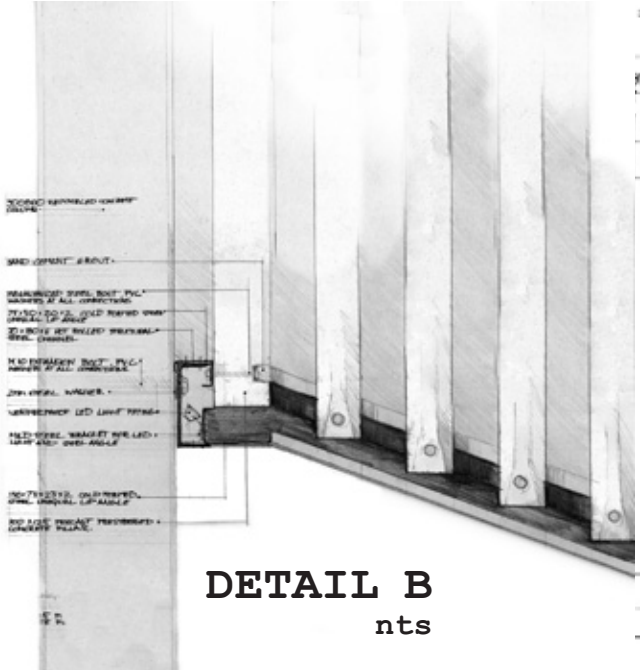
DETAIL A
nts



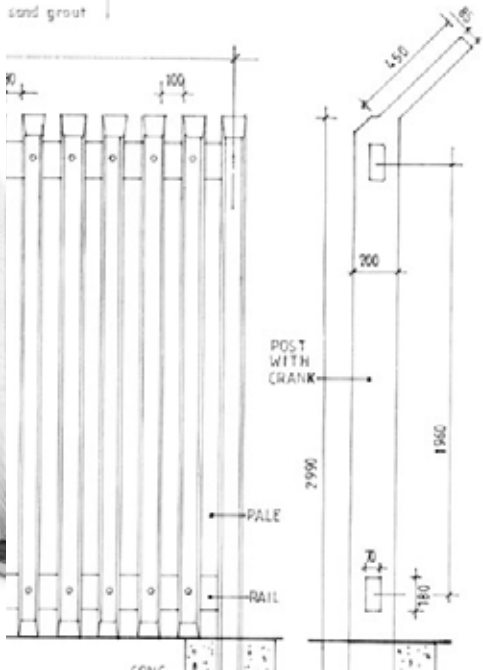
Glazing

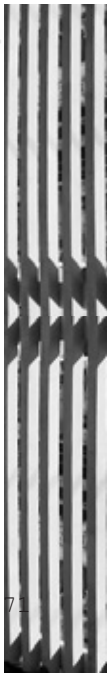
Areas where complete weatherproofing is required will have a layer of glazing as part of the shelter composition. These areas include offices, laundry, store rooms etc. This glazing layer further allows for a measure of control over the ventilation of the building. Control allows for the efficient use of the concrete as thermal mass, by allowing the building to ventilate during summer nights, cooling the shelter, or preventing ventilation during winter nights, retaining heat build-up from the day.

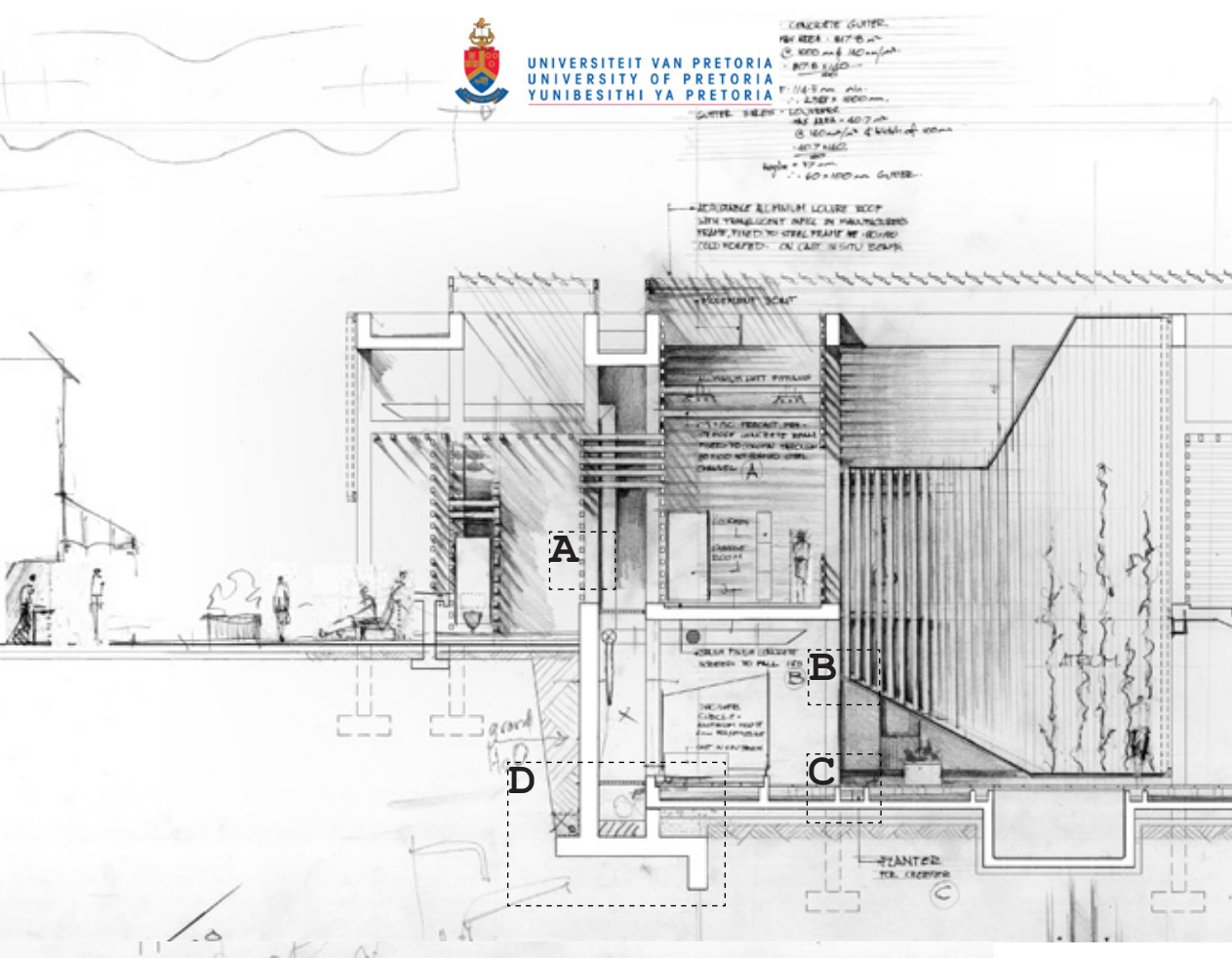


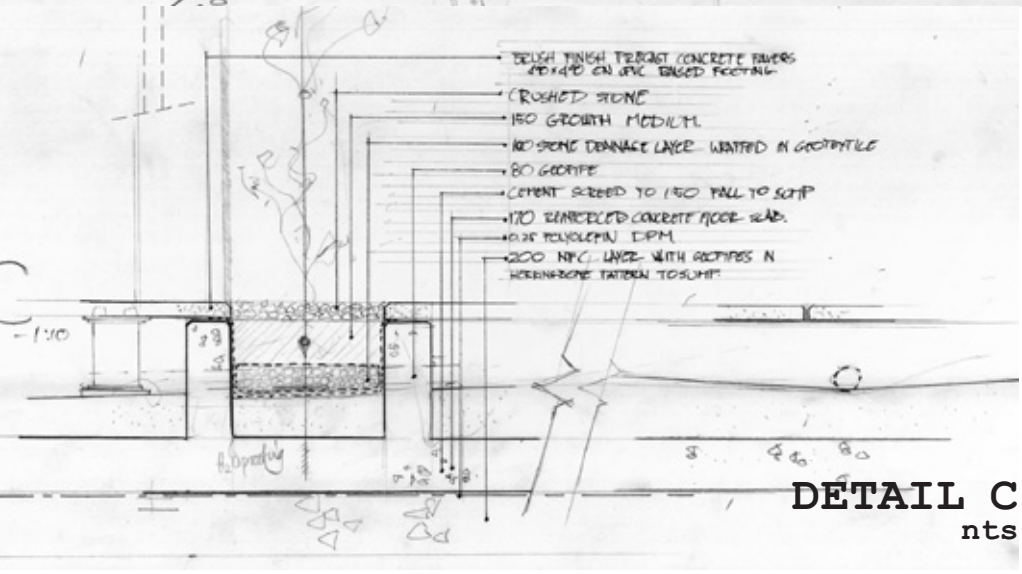


DETAIL B
nts



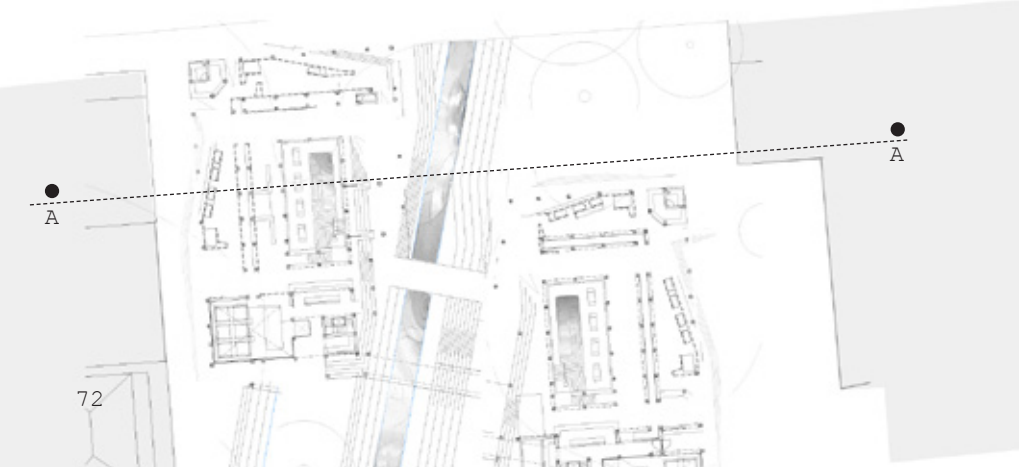






DETAIL C
nts

BOOM STREET



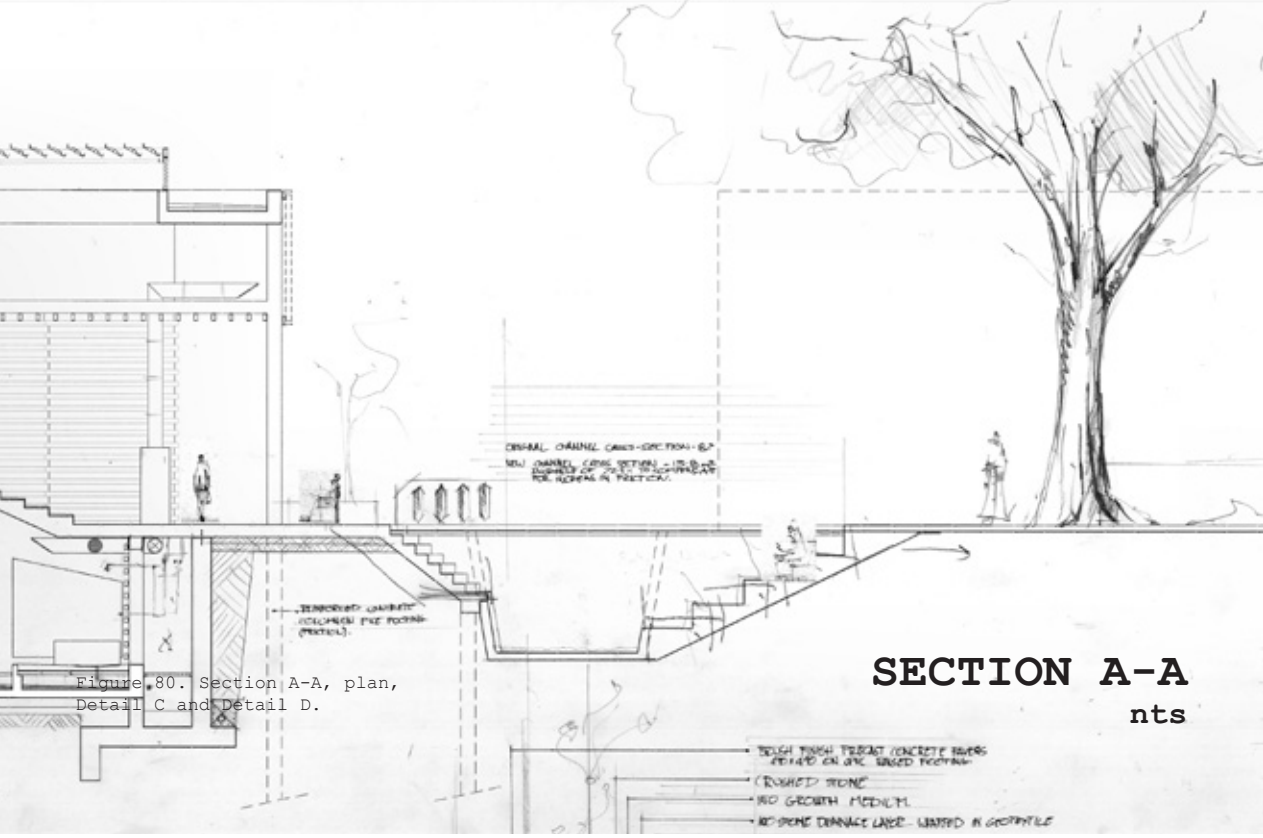


Figure 80. Section A-A, plan, Detail C and Detail D.

Figure 81. 'Vitrex' type 116 18.5mm enamelled steel composite panels to be used in toilet and shower cubicles. Installed on raised stainless steel footings.

Figure 82. Non-skid, fungicide treated, draining, replaceable vinyl tiles placed in recess as shower floor.

Figure 80.

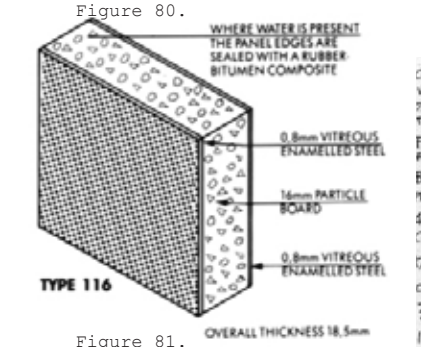
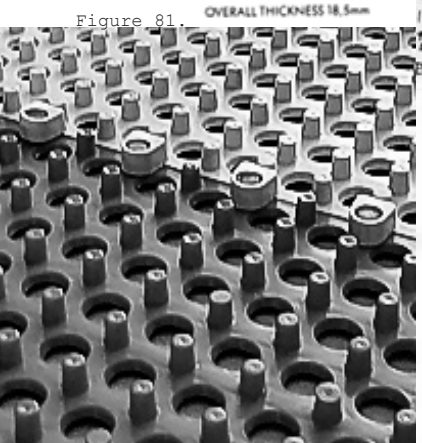
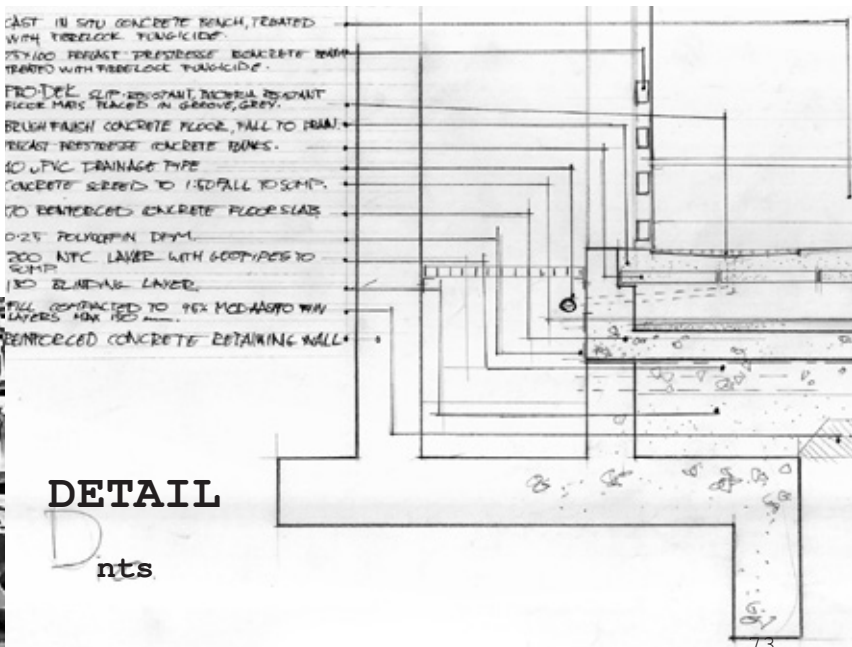


Figure 81.





E

E

LAUNDRY

10 M HIGH HANDRAIL

DELIVERY AREA

10 M HIGH HANDRAIL

RECEPTION

CIRCULATION

FILTERS

G

SUMP

REINFORCED CONCRETE BASE TO SUPPORT FILTERS AND WATER TANKS

LOADED REINFORCED CONCRETE BASE TO SUPPORT SCISSOR LIFT

F

1:10.

SECTION B-B

nts

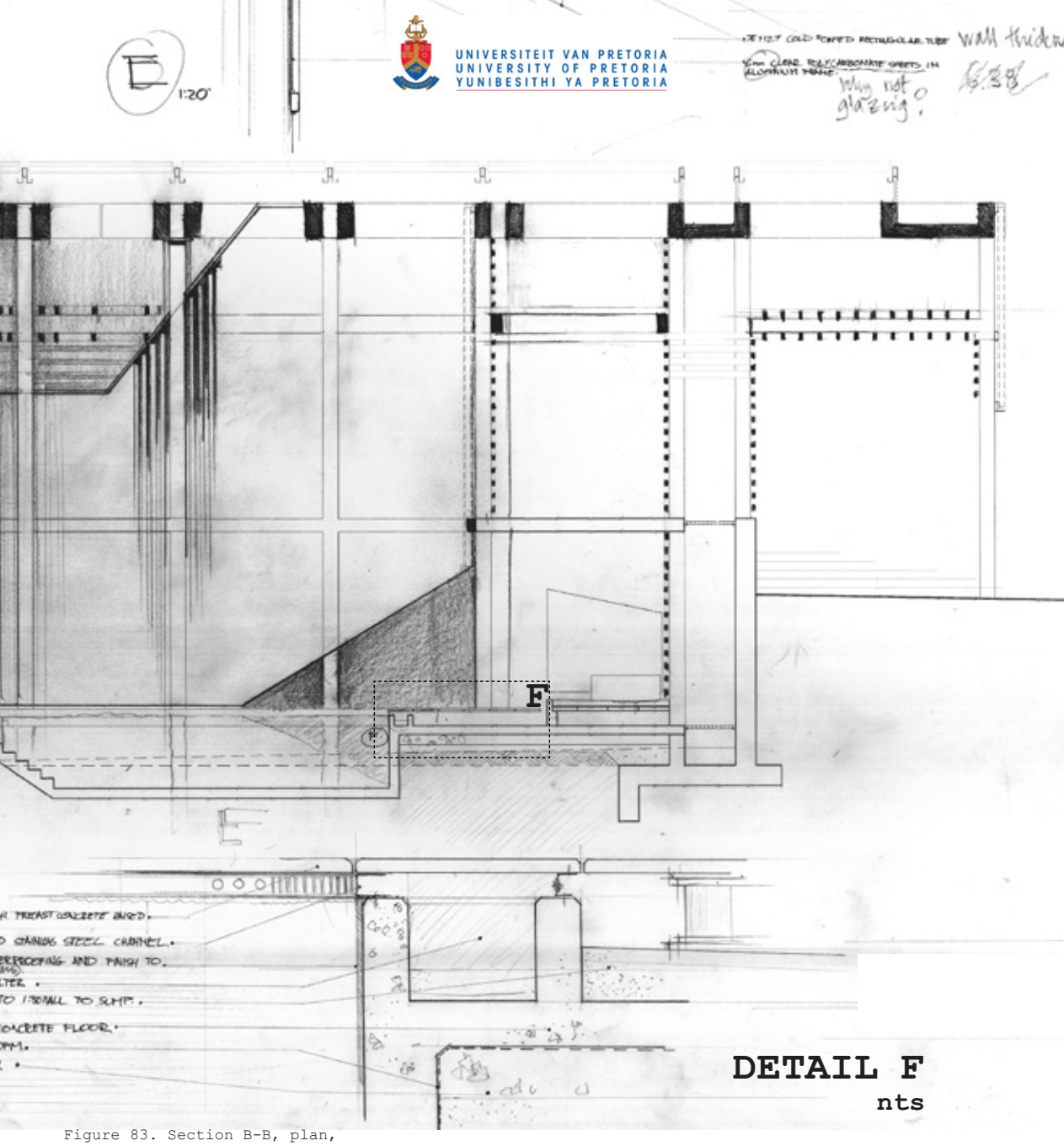
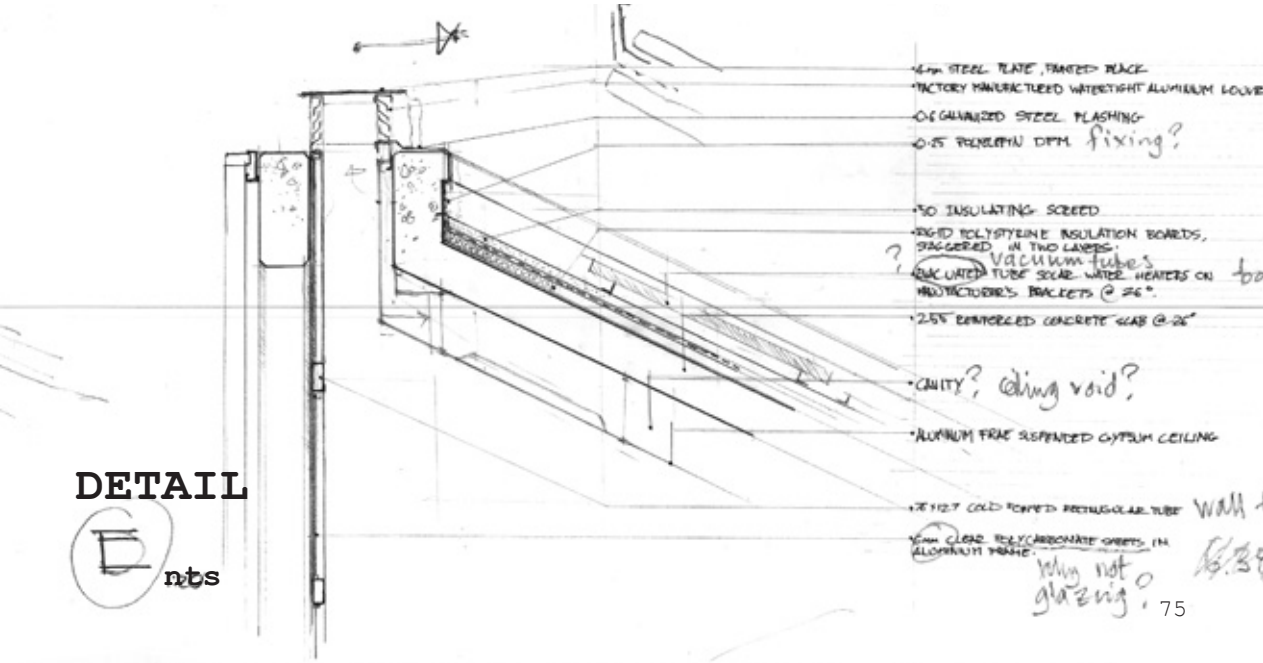


Figure 83. Section B-B, plan, Detail E and Detail F.



Services

Servicing of the building refers to the systems and methods employed to manage the functional requirements of the programme. These include ventilation, thermal comfort and climate control, water management, drainage, and circulation of people and goods. As previously discussed in design development, the intent is to use the service areas as shelter for the private nature of the programme. The result is the use of courtyards framed by service corridors. These corridors are rooted in the service, staff, and administrative areas of the building.

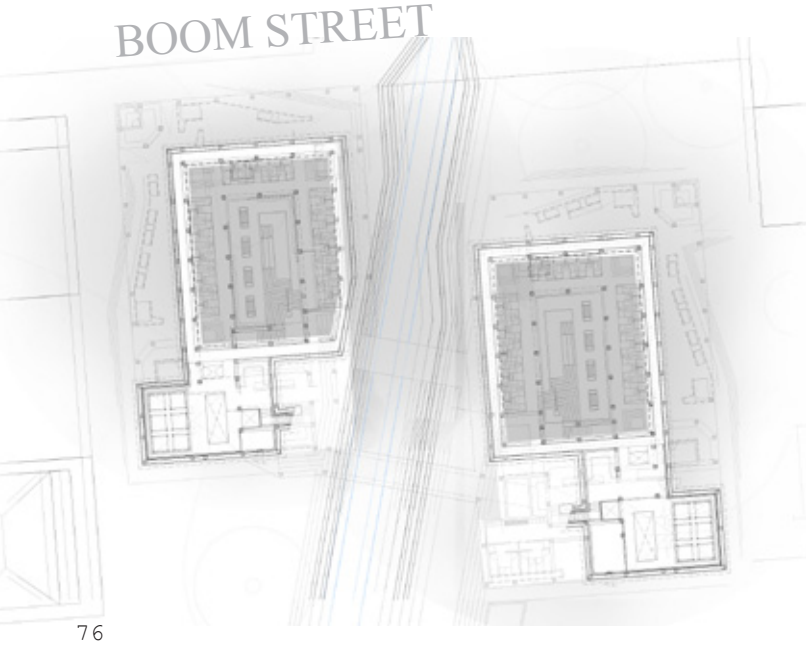
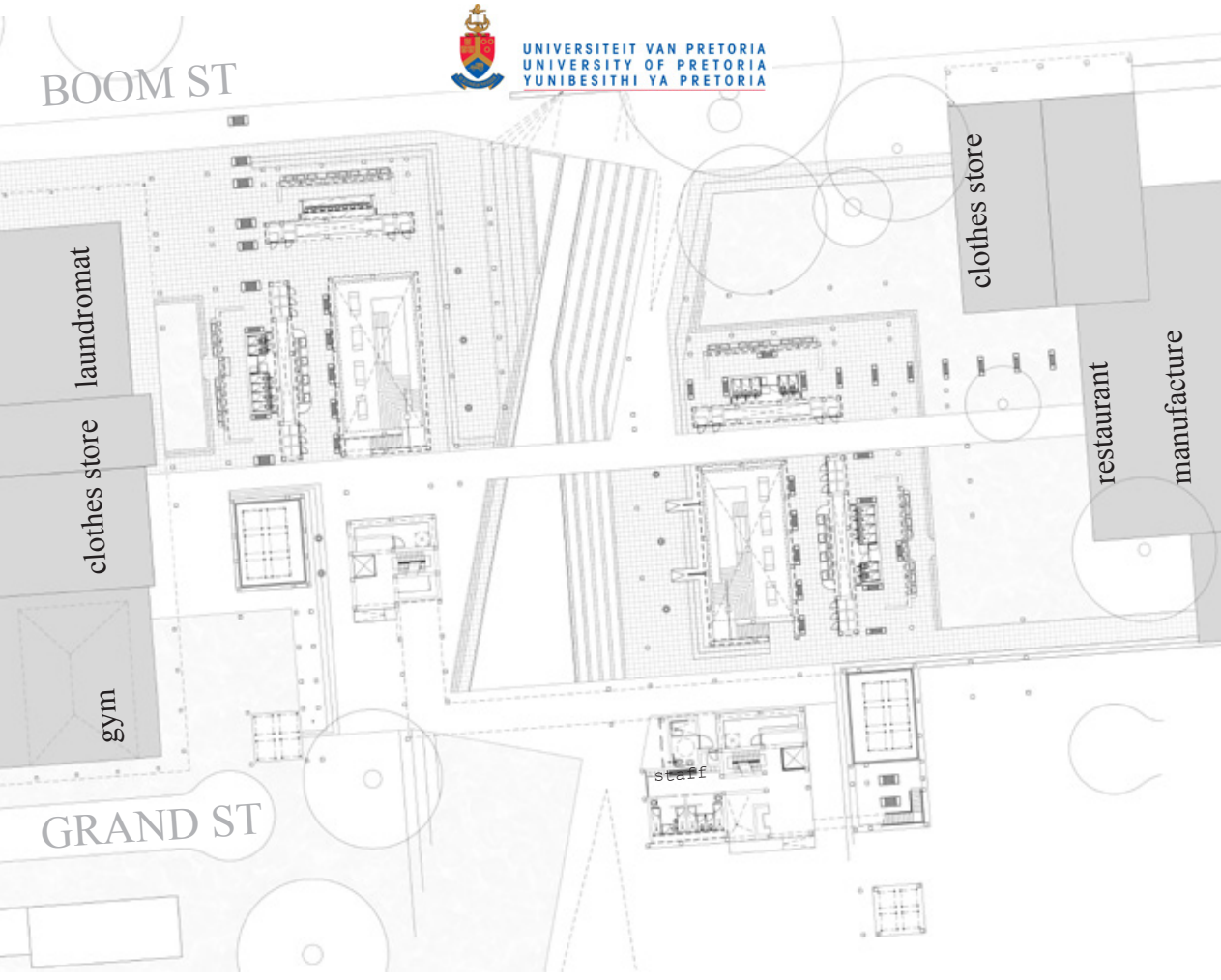


Figure 84. Diagram illustrating servicing strategy, particularly the relationship between service(top) and serviced areas. The loop of service corridors allows for a private internal courtyard, while being able to service the surrounding area.

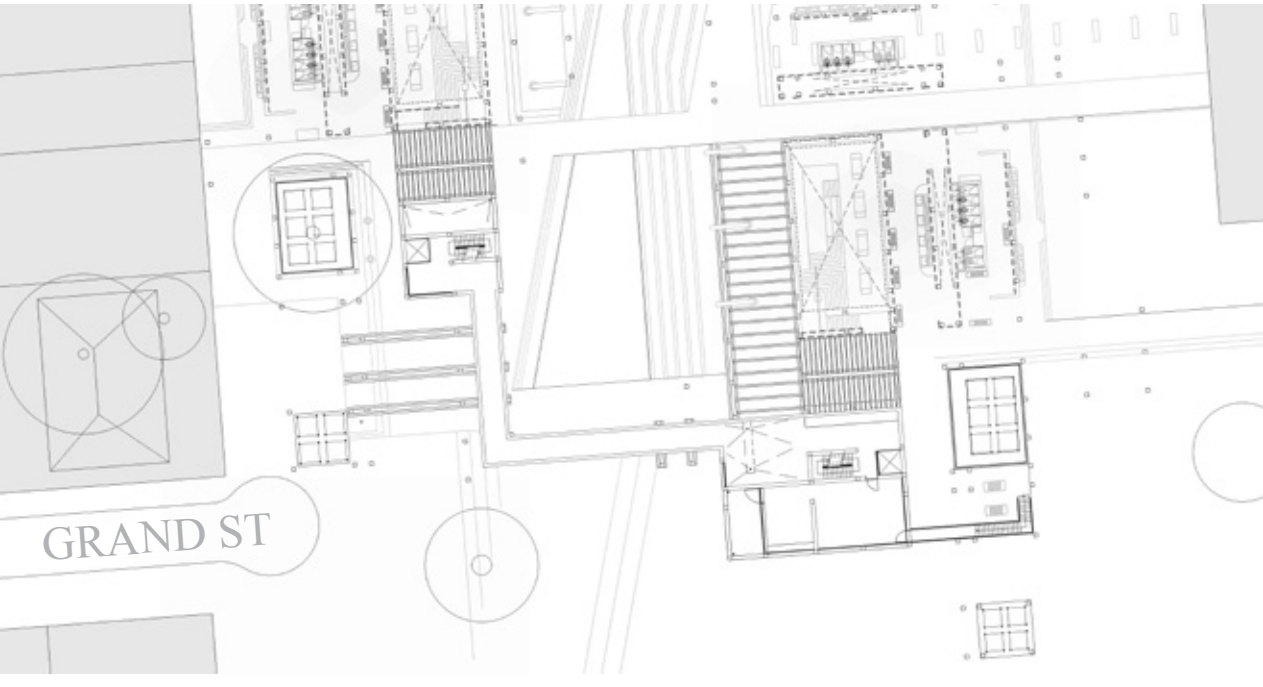
Figure 85. (opposite) Conceptual circulation diagram.

Circulation

Circulation refers to the manner in which the shelter is used, by people and services. Movement of people differs depending on the reason for entering the facility. A pedestrian walking to the CBD can move through the building without being physically impeded. The manner in which a person moves through the building becomes a social act sensitive to gender. While free physical movement is encouraged to prevent isolation of the building, it is envisioned that social buffer areas appropriated by gender are established. These areas will cater to the needs of the genders commercially while acting as a meeting places and passive security zones. In general, movement of people only filtering through, or those using the toilet facilities, will be in a north-south manner. Those using the building for longer periods will move in an east-west direction as the building is used, possibly at some point entering the existing buildings east and west of the channel. Those who use the building for bathing will descend into the central courtyard, where enclosure is complete. Staff movement is accommodated in the form of a bridge over the channel, allowing for people and goods to move through the service areas. The service areas further include vertical circulation in the form of stairs and service lifts to move goods vertically. Deliveries are accommodated to the south of the service areas, where access is gained from Grand street.



GROUND FLOOR PLAN
nts



FIRST FLOOR PLAN
nts

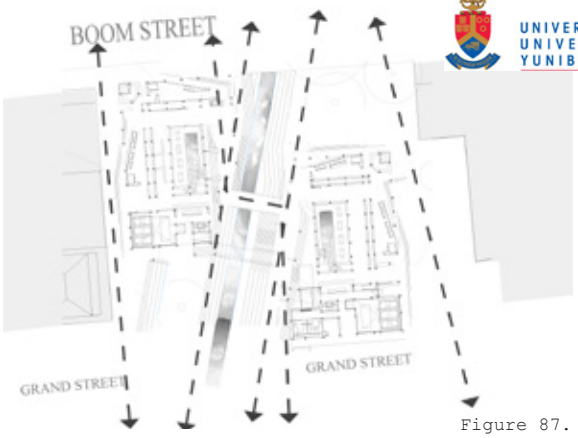


Figure 87.

Figure 88.

Figure 89.

Figure 90.

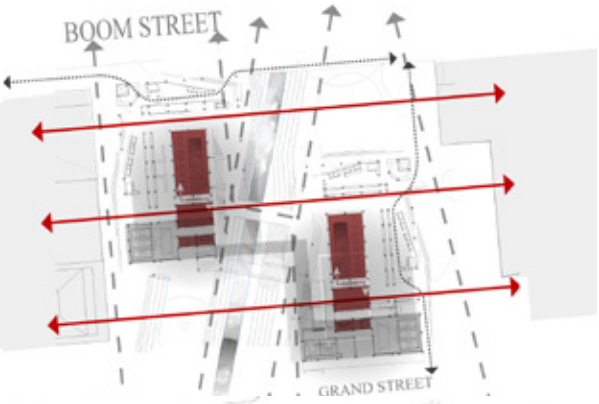


Figure 91.

Figure 92. Section diagram illustrating movement downward to private bathing and social area through a filter provided by service areas.

PUBLIC - COMMERCIAL

PRIVATE - BATHING

Ventilation

As the building consists of layers of permeable concrete skins, ventilation of the structure occurs naturally. In the case of the louvred roof being closed, ventilation is still accommodated for in the roof construction. Operable glazing sections as part of the shelter construction allows for a measure of control over ventilation conditions. The plant and mechanical equipment used in the service areas can generate uncomfortable levels of heat; these areas are therefore isolated and mechanically ventilated. Implying the a mixed mode ventilation strategy.

Climate control

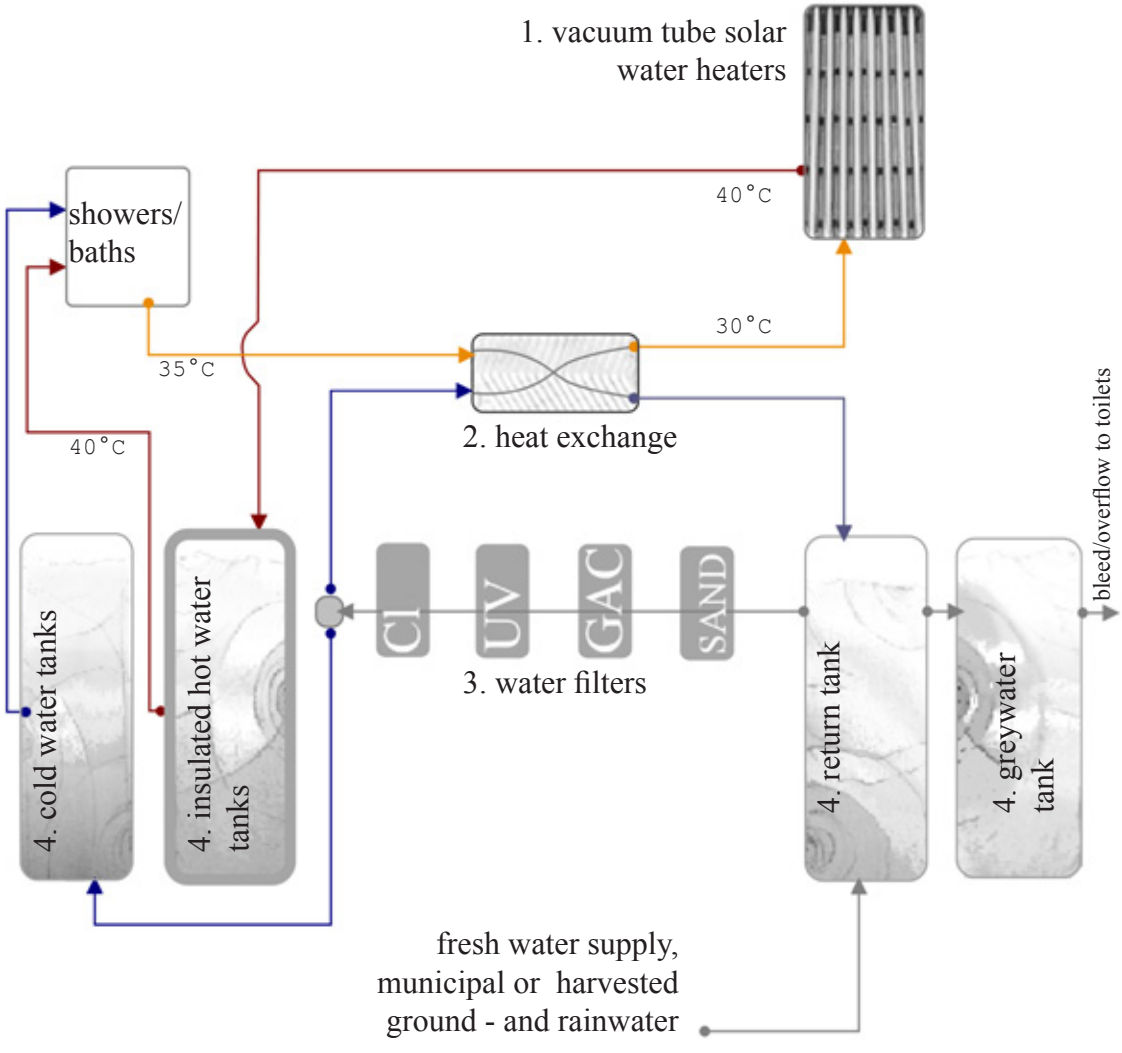
The thermal mass of the building is used as a method of regulating thermal conditions inside the building. Heavy mass elements are able to absorb heat and re-radiate it into a building at a later time. Concrete provides good thermal mass (Green building council of Australia, 2005:40). A strategy to ventilate the mass that gathered heat during the day at nighttime during summer is investigated. This ensures that the heat of the day only reaches the interior at night, ventilating rids the structure of this heat. During winter months the mass is encouraged to retain its heat by not ventilating the structure at night. As a large section of the building is located below the ground level and the earth below 500mm is very constant in temperature even when the outdoor temperature undergoes great fluctuation(Green building council of Australia, 2005:41). The temperature of the building mass is tempered by the building being earth sheltered, using the earth as a heatsink. Again a mixed mode strategy is employed, areas of permanent occupancy or of heat buildup, are mechanically maintained, aided by the passive mechanisms. Decentralized roof mounted air-conditioning units are proposed to regulate the service areas. Taking precedent from ancient baths, the system of raised floors is retained. The raised floor aids in water drainage and allows for warm air from service areas to be pumped into the cavity, heating the space above.

Figure 93. Photograph of the raised floor of the thrermae of Pompeii. showerman 356

Water management

Water management plays a crucial role in ensuring the feasibility of the facility. A potentially large amount of water is used within the building, implying that an efficient method of water harvesting, use and re-use is proposed. Municipal water supply will be the primary source of water, augmented by rainwater and groundwater harvesting. When used for washing, on-site greywater treatment will clean and re-use the water; potable water will have municipal water as source. The primary method of water heating will be solar, using vacuum tube solar water heaters installed on the roof. The intent is to provide an efficient, not necessarily self-sufficient system. Water heated during the previous day is stored and maintained through the night. All sanitary fittings are water efficient, vandal resistant and operated through IR sensors. All hot water pipes and storage tanks are insulated to prevent heat-loss.

Figure 94. Diagram of water reticulation treatment and heating system.



1. Vacuum tube solar water heater

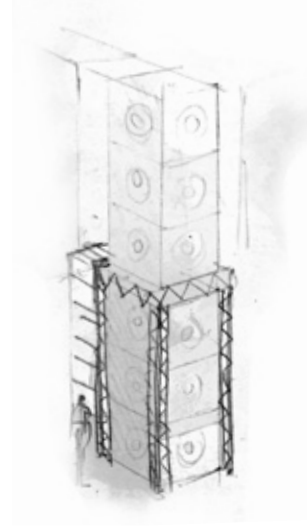
Each Vacuum tube consists of two transparent borosilicate glass tubes. The outer tube is manufactured according to SABS standards. The inner tube is coated with a special selective coating, which has excellent solar heat absorption and minimal heat reflection properties. The air between the tubes is removed to form a vacuum, which eliminates conductive and convective heat loss, enabling the tubes to absorb the energy from the sun's infrared rays which can pass through the clouds. Wind and low temperatures have less of an effect on the performance of the vacuum tubes compared to flat plate collectors due to the insulating properties of the vacuum. The tubes passively track the sun's heat all day. The shape of the tubes provides superior absorption as the tube is round, the sun's rays are always striking the tube's surface at right angles, minimizing reflection (Sun Africa, 2009:2-3). A split collector system is proposed, the collector is split from the storage tank and water is pumped through the system. The collectors are placed at an angle of 25 degrees, facing North, maximizing solar exposure year round. One split collector is capable of heating 250 l of water by 40°C in 4 hours in cloudy conditions using a 2.7m2 collector (SolarTech, 2009). Extrapolating this implies that a 2.7m2 collector will heat 500 l of water by 10°C in 1 hour. Based on water requirement calculations below, 54m2 of vacuum tube collectors are required.

2. Heat exchange

A heat exchange is employed to increase the efficiency of the system, made of a highly conductive metal, fluids of differing temperatures exchange heat as the flow through the unit simultaneously. Warm water returning from the showers exchanges its heat with cold water on its way to solar water heaters. The water never mix, only heat is exchanged.

3. Water filtration strategy

A combination of filters are used to address the cleaning of greywater based on the requirements of programme, these include (in order) a coarse sand filter, a sand-granular activated carbon (GAC) filter, an ultraviolet (UV) filter and a chlorinator. The coarse sand filter intends to trap large particles. The fine sand and GAC filter removes soap and organic material from the water as soap bound to organics, in turn bind to the porous carbon granules. The UV filter neutralizes any pathogens that passed through the carbon filter, while the chlorinator serves the purpose of ensuring the long term cleanliness of water in case of storage. All filters use pumps and operate under pressure.



Water storage tank sizes are calculated based on the requirements of programme, locally manufactured Ibeco water storage tanks are used.

Showers: 26 @ 50 *l* per use (10 min)
= 1300 *l* per hour @ 6 uses/hr
= 7800 *l* per hr
7.8 m3/hr storage capacity required

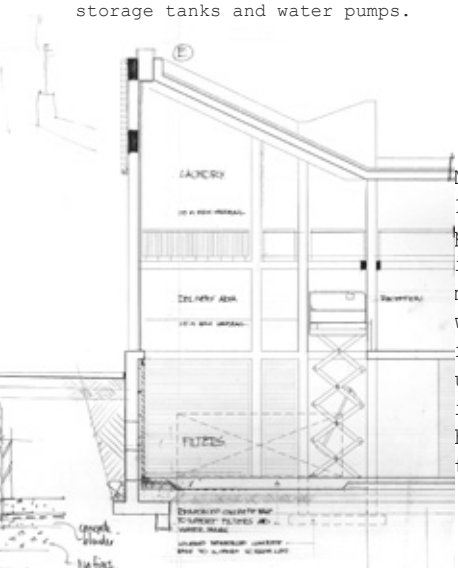
baths: 3 (1m x 1.2m x 1.2m)
= 4.5 m3
@ 1 change per hr
= 4.5m3
per hour storage capacity required

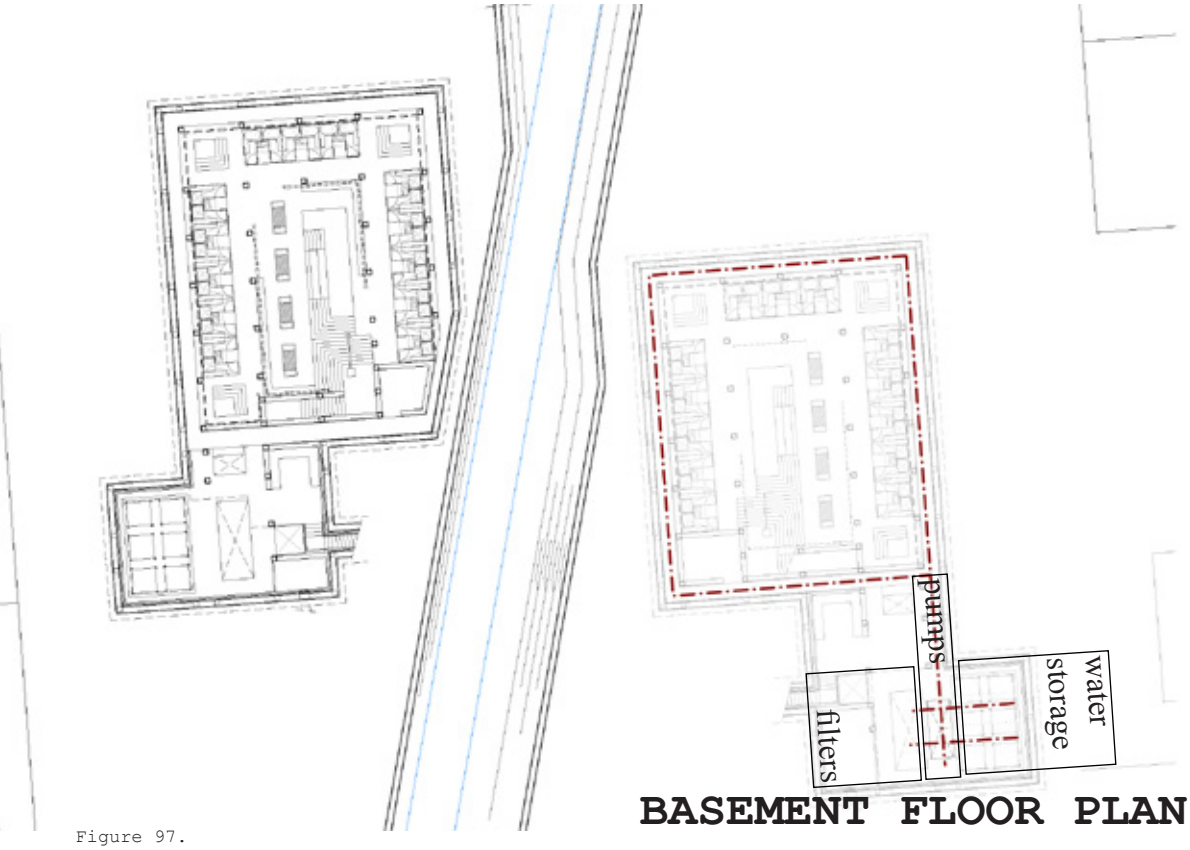
Total water use = 12 m3 per hour (peak loads, all showers running a full hour)

Modular Ibeco water storage tanks employed measure 1.728 m3 per module @ 6 modules per tower = 10.4 m3 per tower. Six towers are used, 10.4 m3 for returning water, 20.8 m3 for hot water storage and 20.8 m3 for cold water. The sixth tower is used to store water returning from pipes and showers when the facility is not in full use. Two towers per water use implies that while one is drained, the other is filled with water returning from the filters and heaters. These calculations apply for one half of the facility and is applied twice.

Figure 95. (opposite)
Modular water storage tanks stacked and supported to form towers.

Figure 96. Section through service areas, note reinforced floor to support filters, water storage tanks and water pumps.





BASEMENT FLOOR PLAN

nts

Figure 97.

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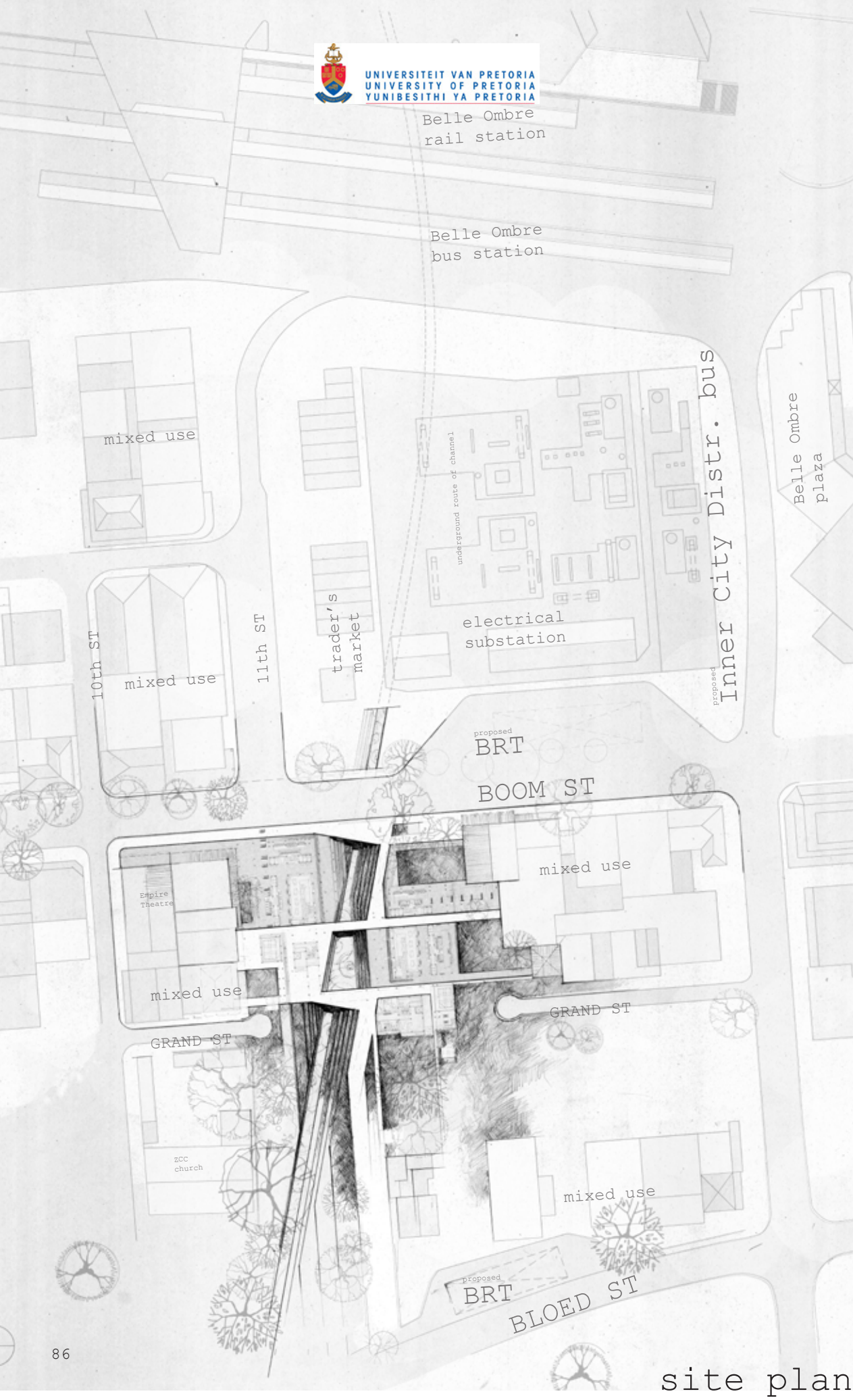
05. Conclusion


Belle Ombre
rail station
Belle Ombre
bus station
mixed use
10th ST
mixed use
11th ST
trader's
market
underground route of channel
electrical
substation
proposed
Inner City Distr. bus
Belle Ombre
plaza
proposed
BRT
BOOM ST
Empire
Theatre
mixed use
mixed use
GRAND ST
GRAND ST
ZCC
church
mixed use
proposed
BRT
BLOED ST

site plan

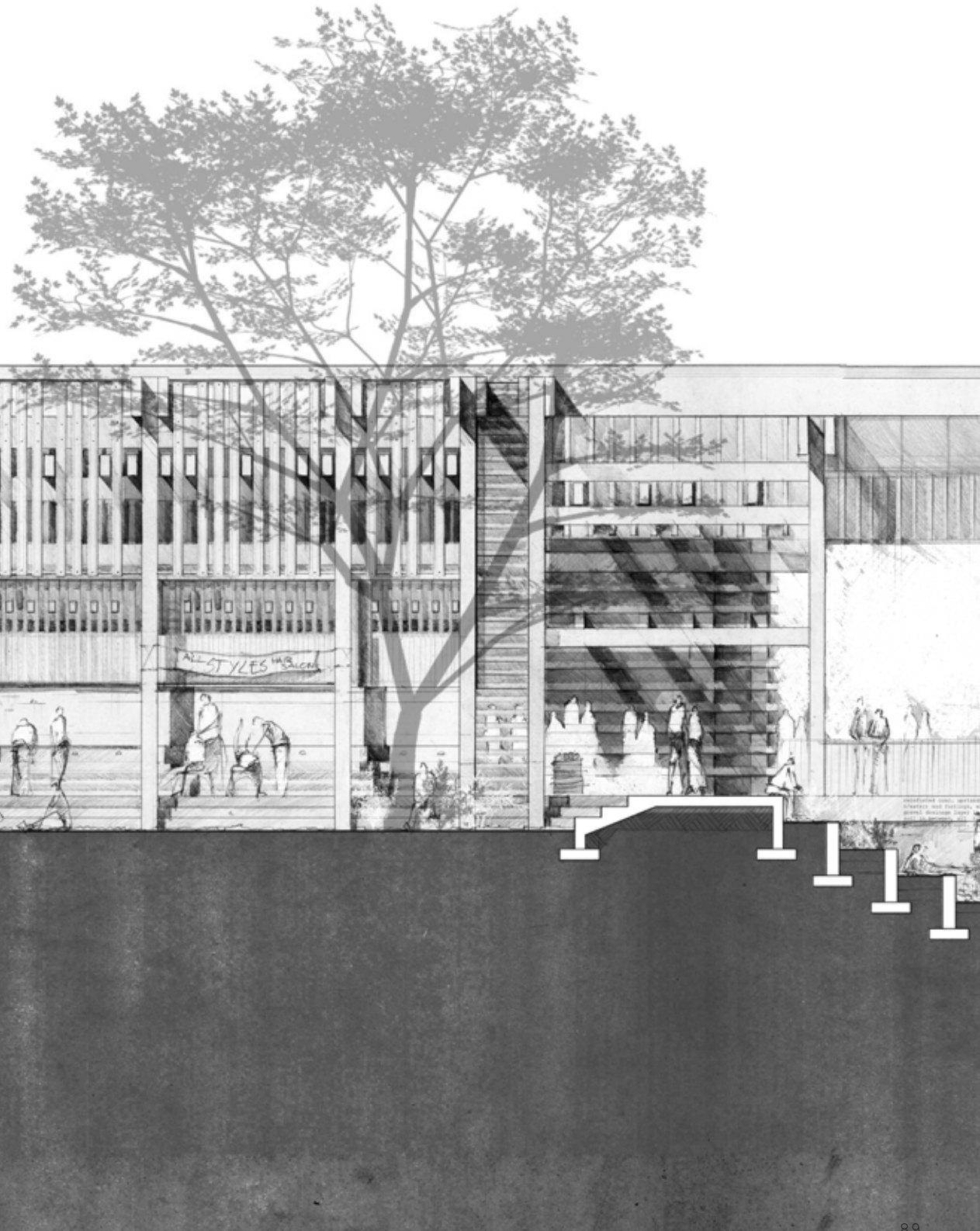
Figure 98. (opposite) site plan
not to scale.

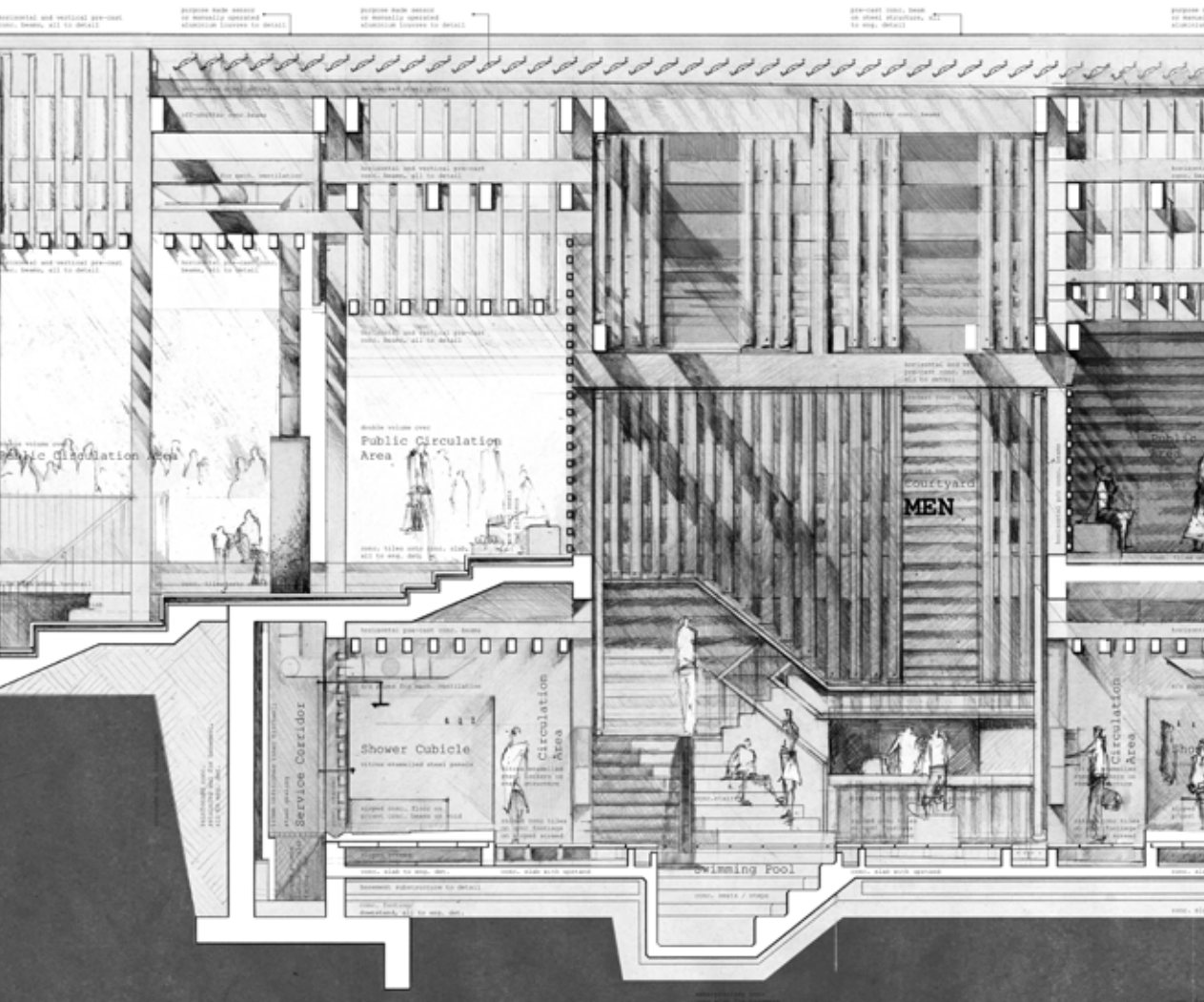

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

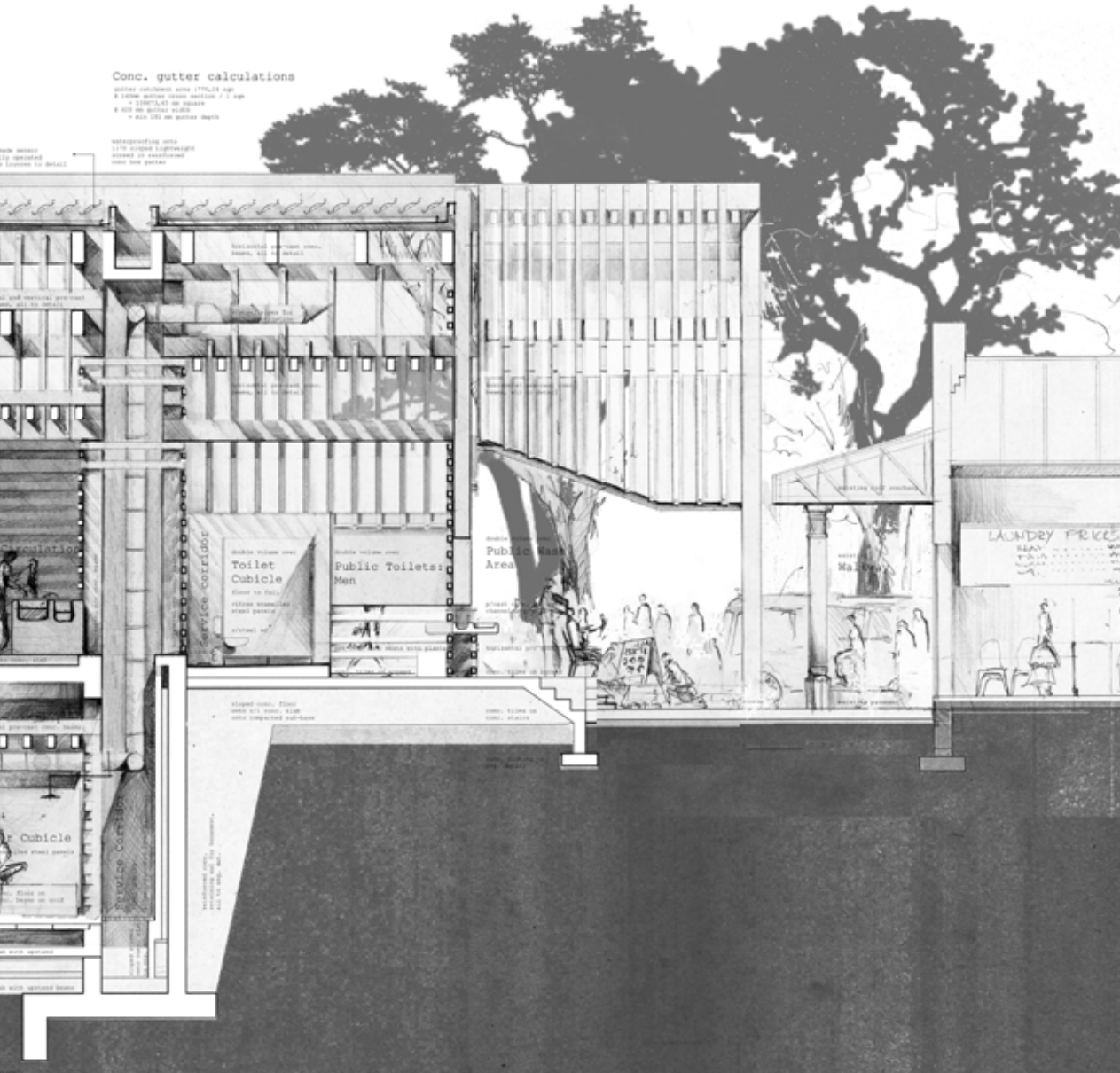
section A-A

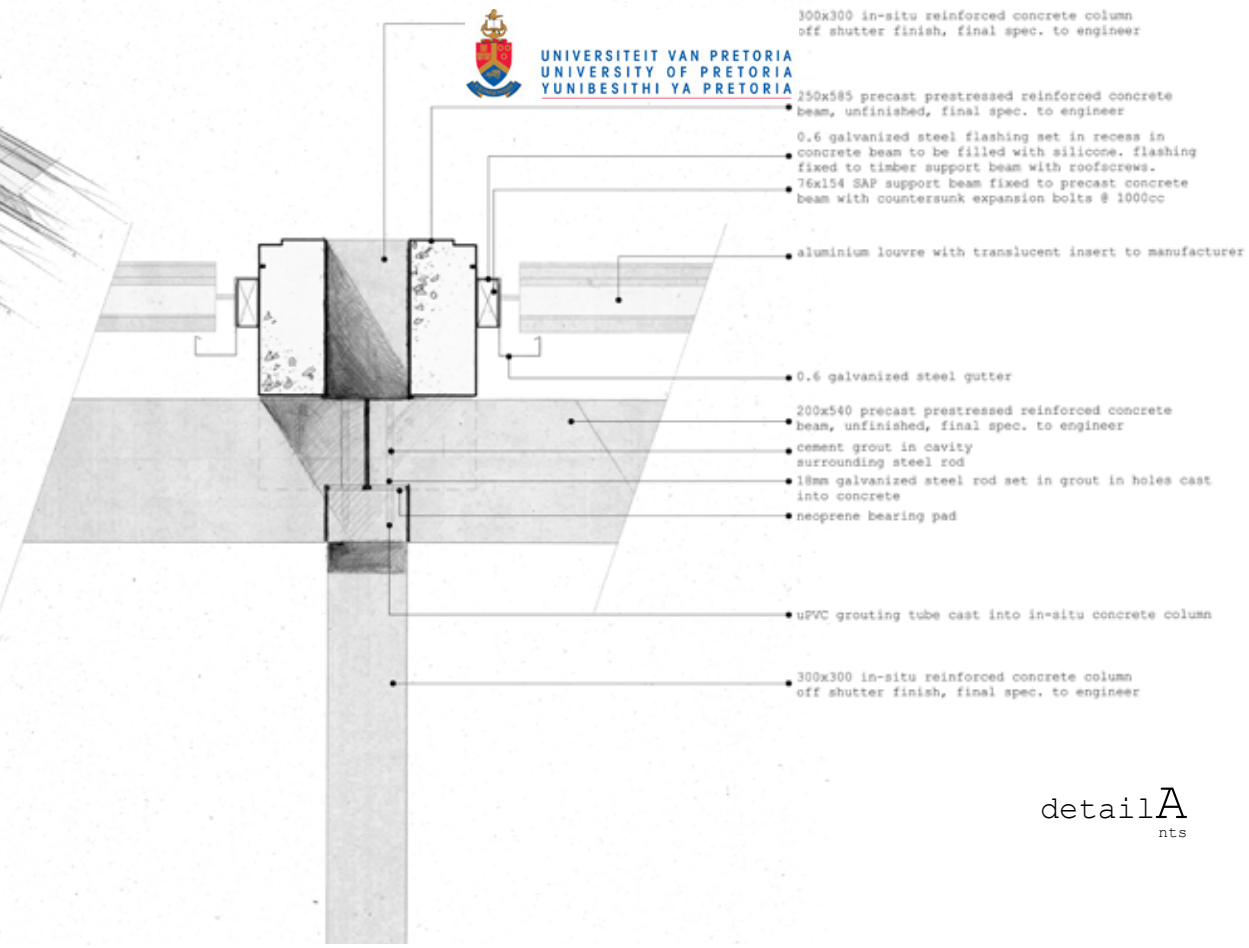

SALE

Figure 99. (opposite, below and next page) Section a-a nts.

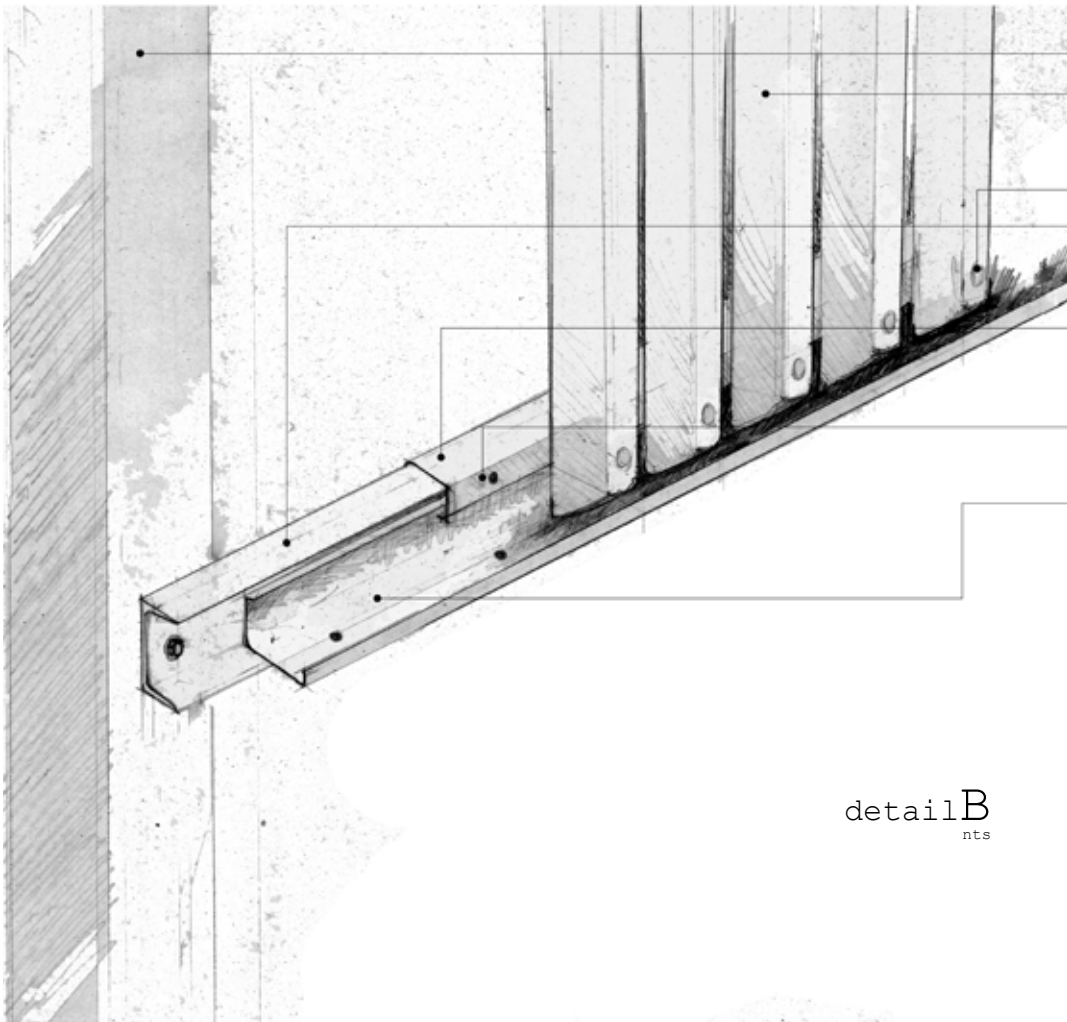



Public Circulation Area
Public Circulation Area
Courtyard
MEN
Service Corridor
Shower Cubicle
Circulation Area
Swimming Pool
Circulation Area

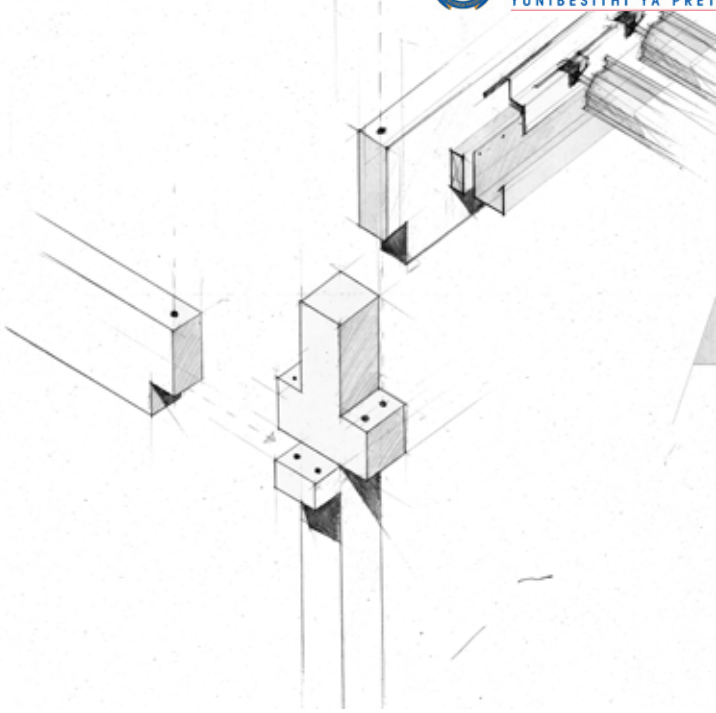

Conc. gutter calculations
Toilet Cubicle
Public Toilets: Men
Service corridor
LAUNDRY PRICES



detail A
nts



detail B
nts



300x300 in-situ reinforced concrete column

100x125 prestessed precast concrete post
unfinished, bolter to steel support beam with
galvanized steel bolts to engineer, steel and PVC
washers at all connections.

cement grout fill

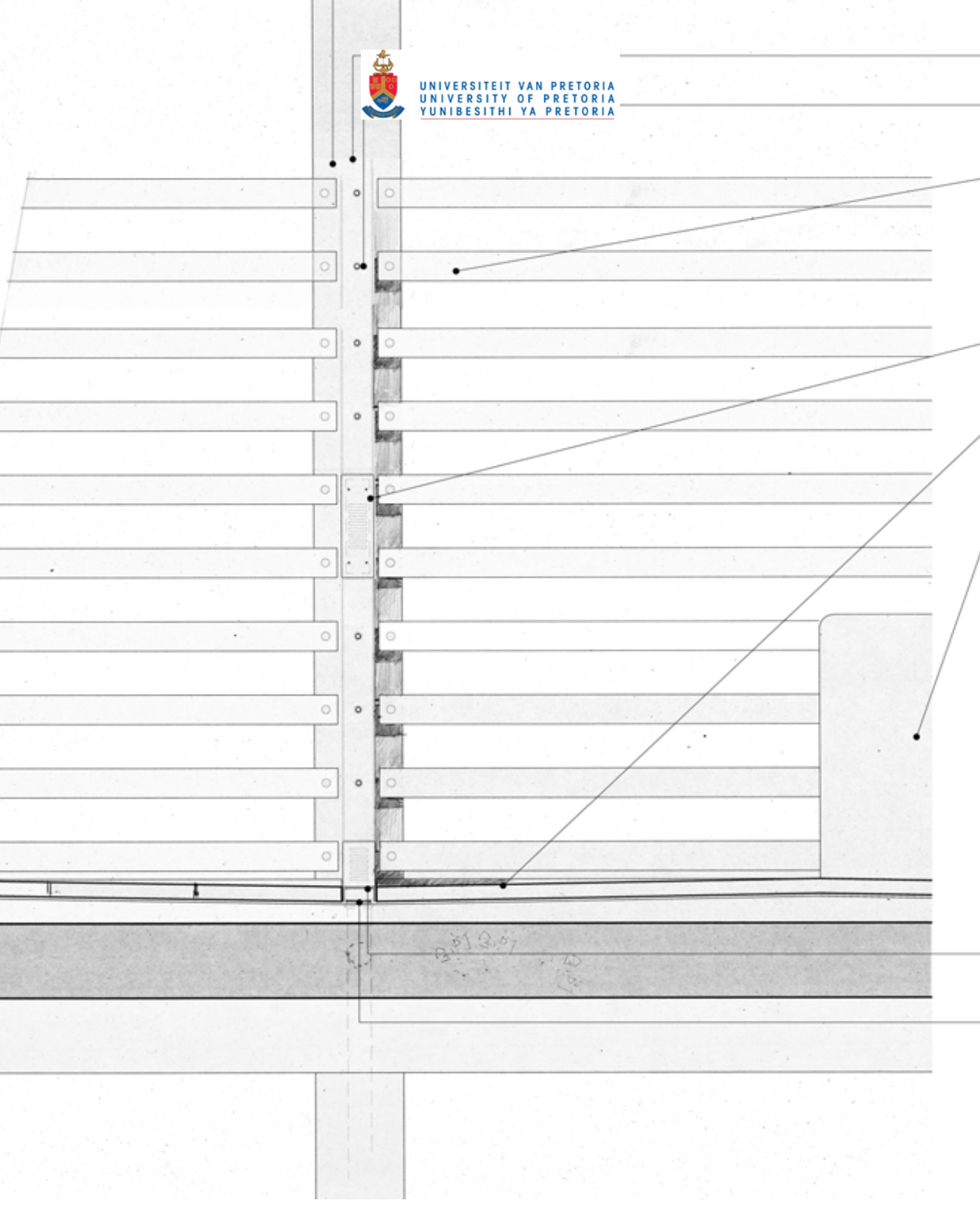
10x180x22,0 hot rolled taper flange structural
steel cahnnel bolted to concrete column with expansion
bolts, 2mm steel washer betwee channel and column as
spacer, also allowing for expansion through oval hole in channel

75x50x20x2,0 galvanized cold formed unequal
lip angle bolted to channel, to act as fixing bracket
for concrete posts.

hole for concrete post connection bolt

175x75x27x2,0 galvanized cold formed unequal
lip angle bolted to channel, toform shadowline, 15mm
holes drilled for drainage at 500cc

Figure 100. (including opposite)
deatails A & B. nts.



detailC
nts

76x102x6,7 hot rolled galv[illegible] steel channel
fixed to column with expa[illegible]

expansion bolts @500 cc wi[illegible]

100x150 precast prestress concrete beam fixed
to column to detail, on threaded rod cast into concrte column
Pvc and steel washers to all connections.

76x102x6,7 hot rolled galvanized steel channel, perforated and
accomodates light fitting, fixed to column with welded steel
bracket with countersunk self tapping steel screws
removable for maintenance of wp LED light fitting

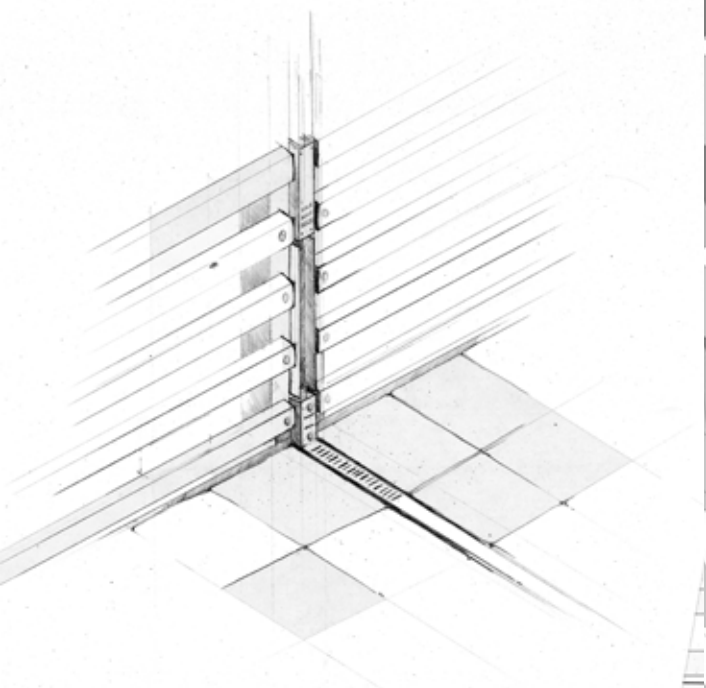
490x490x50 precast concrete tiles on cement
screed to 1:70 fall to floor drain

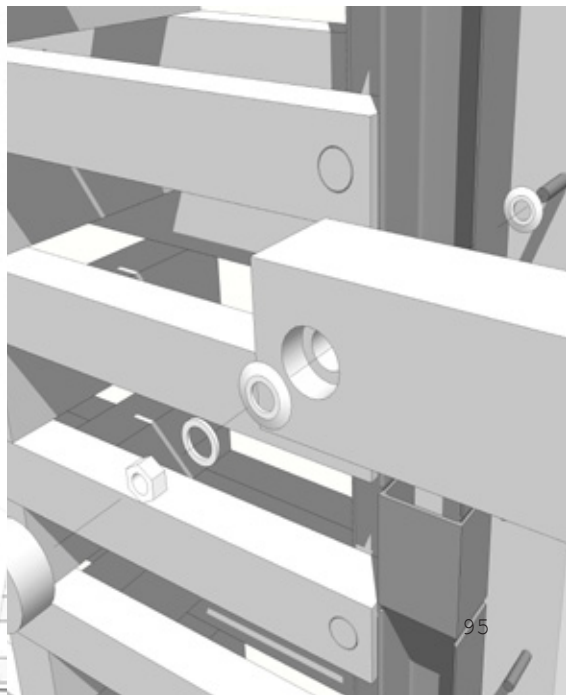
in-situ concrete washing troughs, polystyrene blocks
to act as void filling.

76x102x6,7 perforated galvanized steel channel fixed to
concrete column with M8 expansion bolts where welded
vertical extension connects to column. all welding to be
done befone galvanizing.

uPVC floor drain set in cement screed, 80mm uPVC
downpipe in column to basement drain and
greywater reticulation system

Figure 101. (including opposite)
detail C. nts.





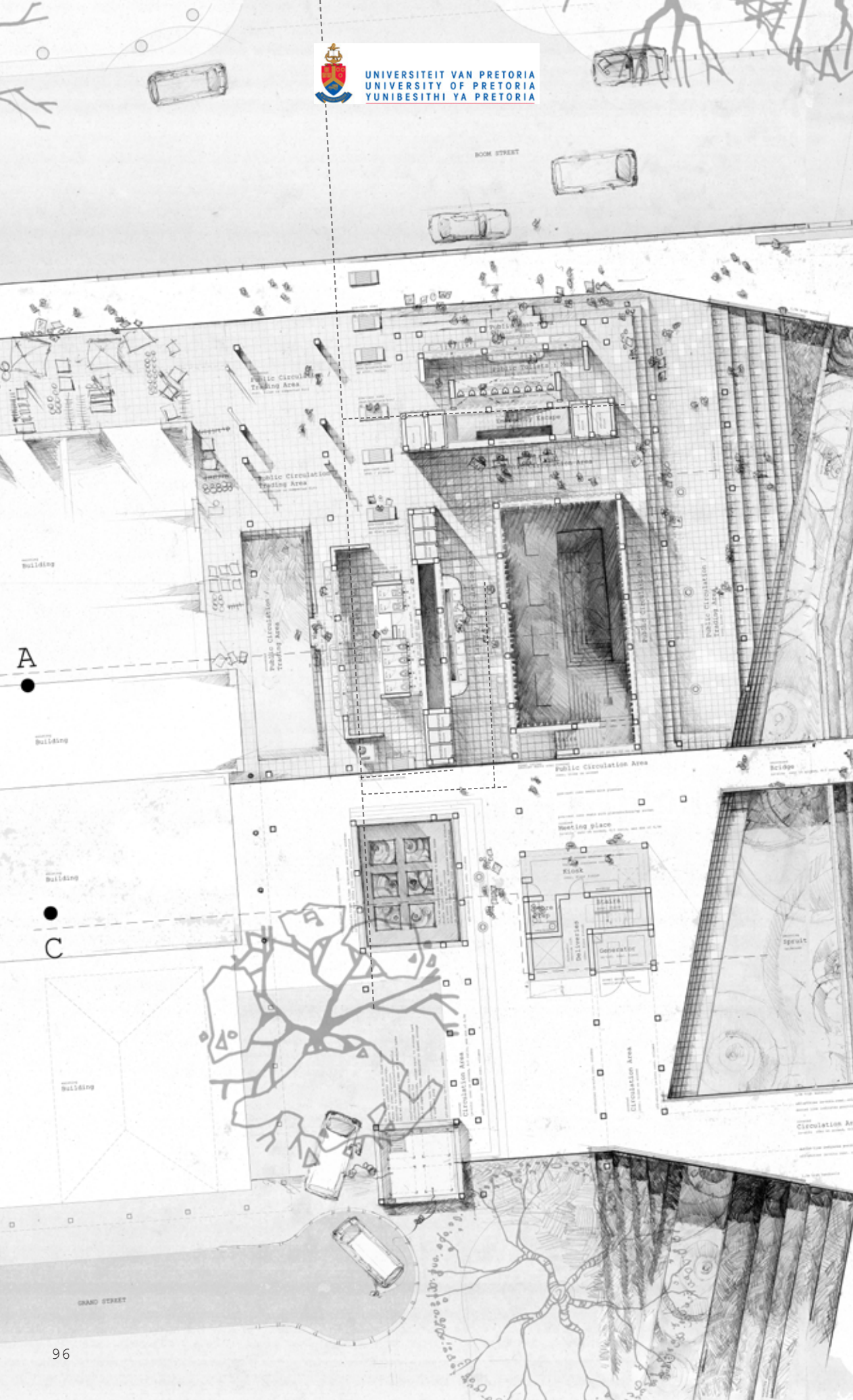
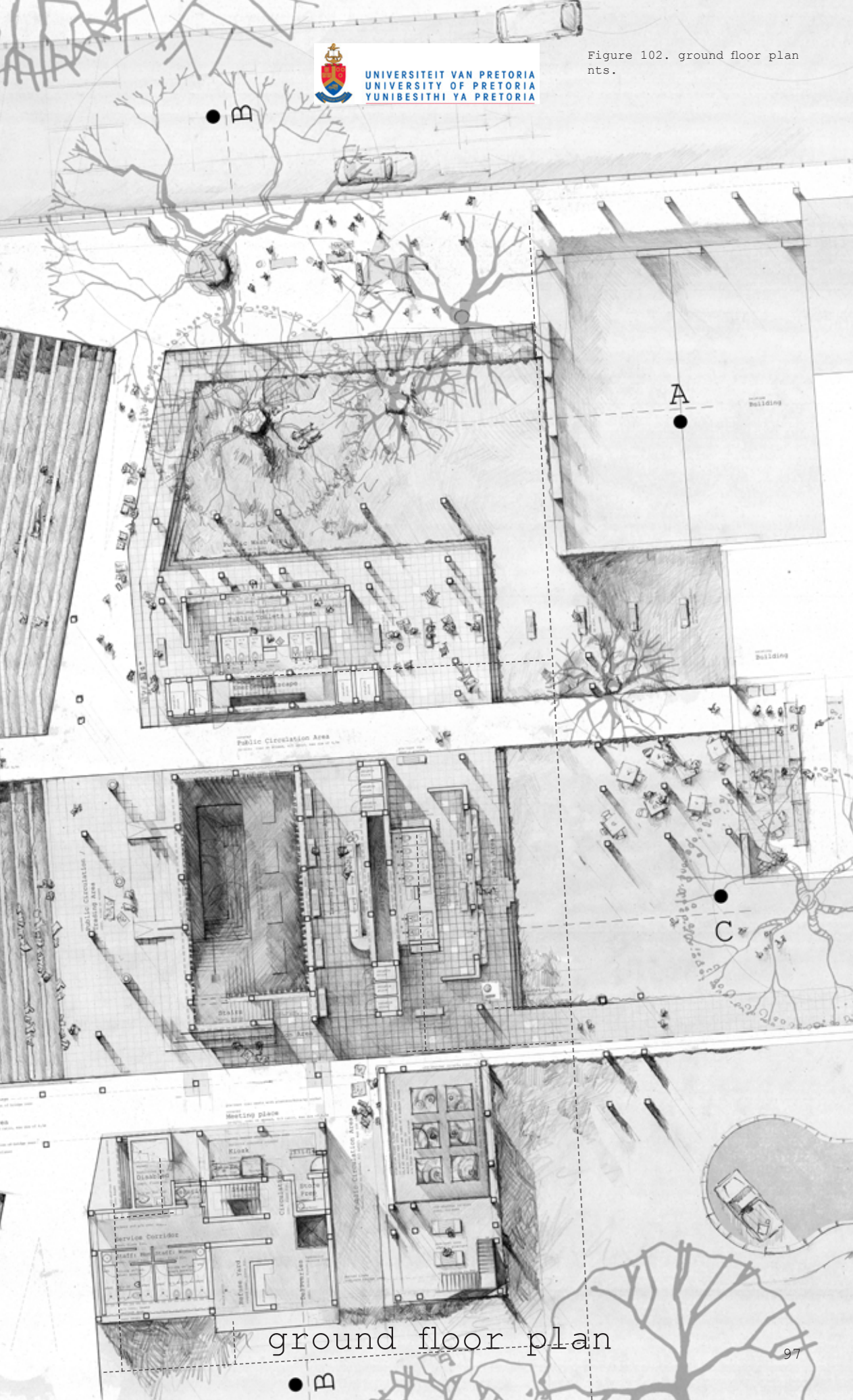

BOOM STREET
A
C
Public Circulation Area
Meeting place
Kiosk
Bridge
Circulation Area
GRAND STREET

Figure 102. ground floor plan nts.



ground floor plan

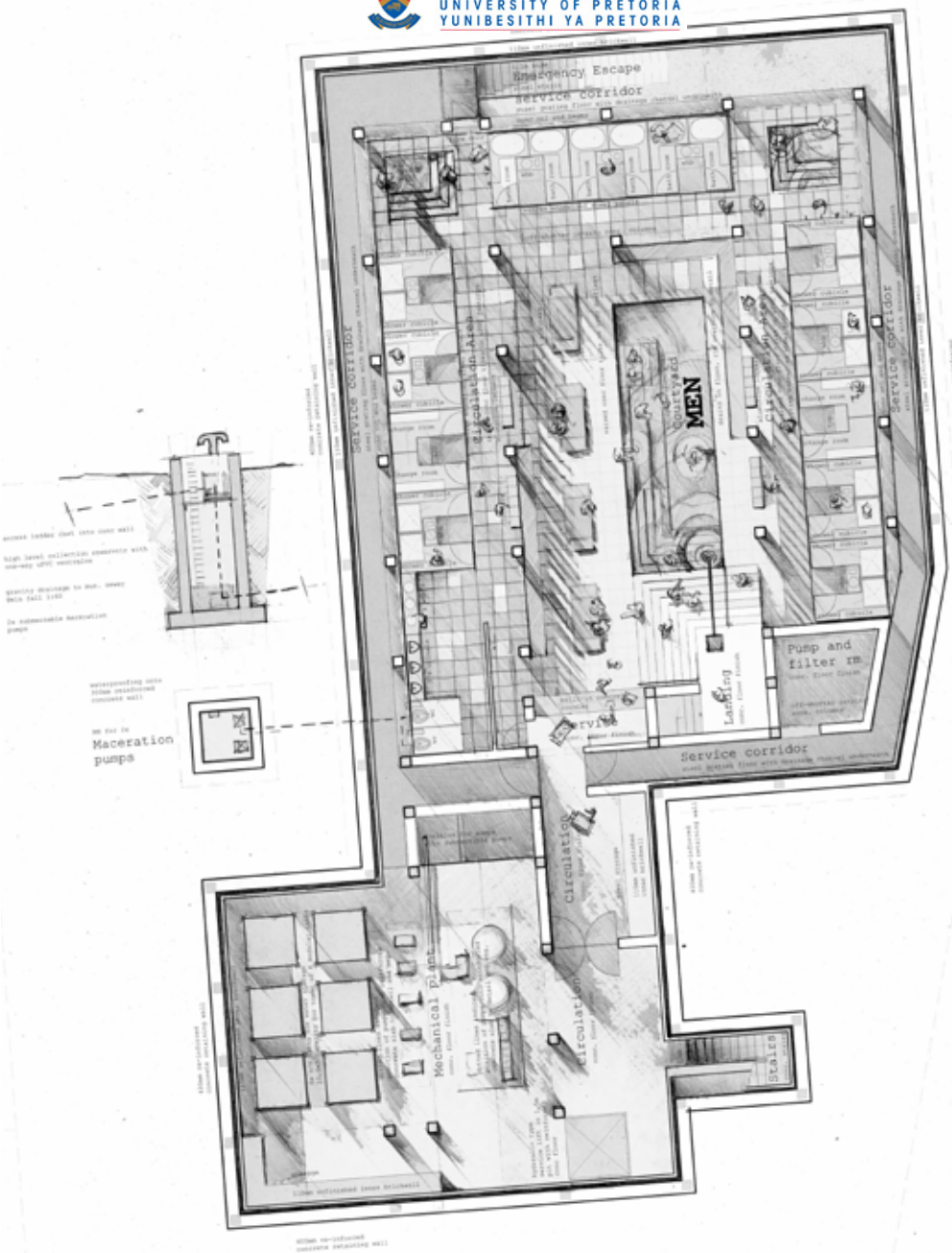
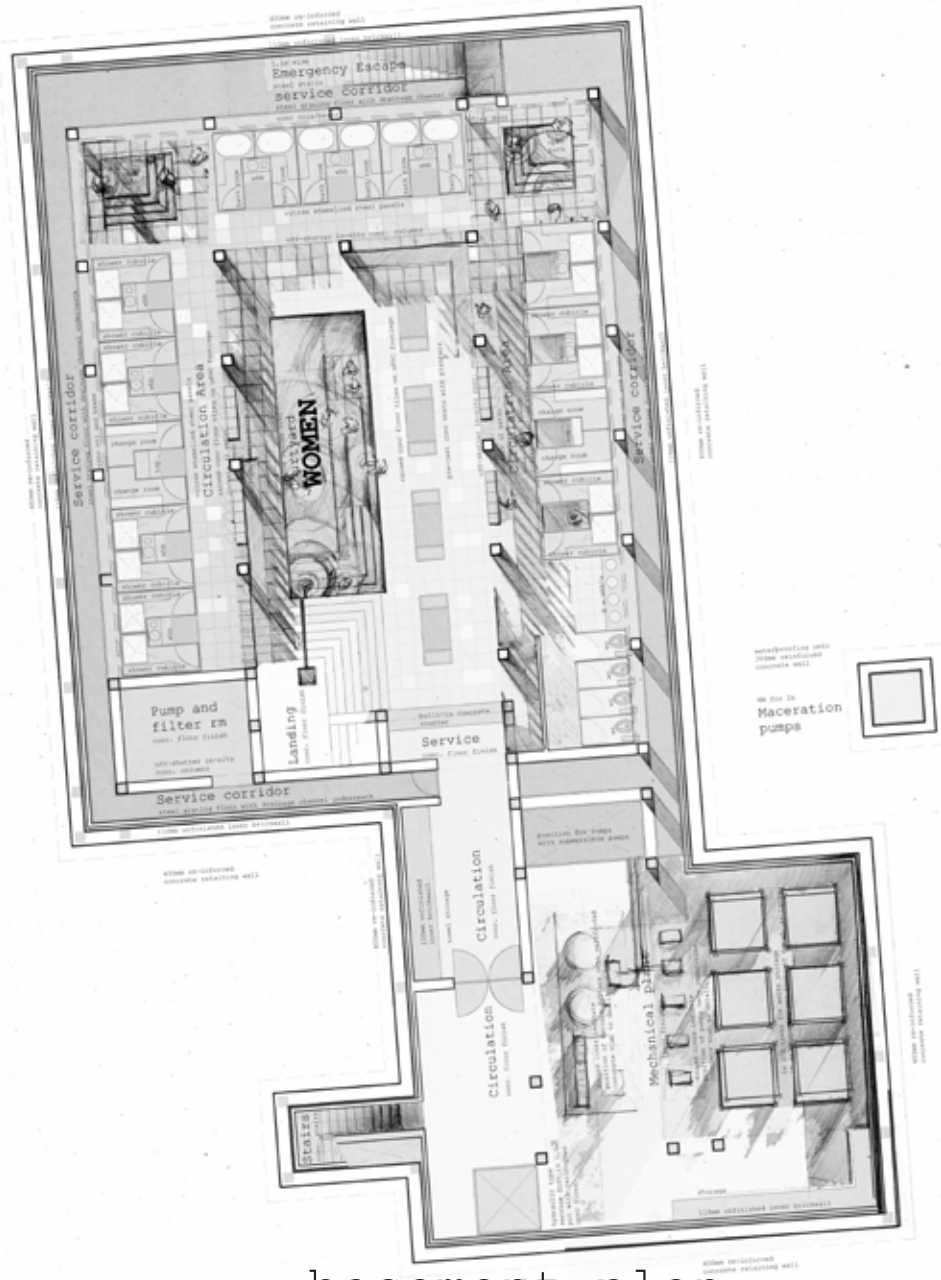

Emergency Escape
Service corridor
Service corridor
Circulation Area
Courtyard
MEN
Service corridor
Pump and filter rm
Landing
Service corridor
Circulation
Mechanical plant
Circulation
Stairs
Maceration pumps

Figure 103. basemant level plan nts.



basement plan

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Figure 104. Collage including first floor plan. nts.

first floor plan

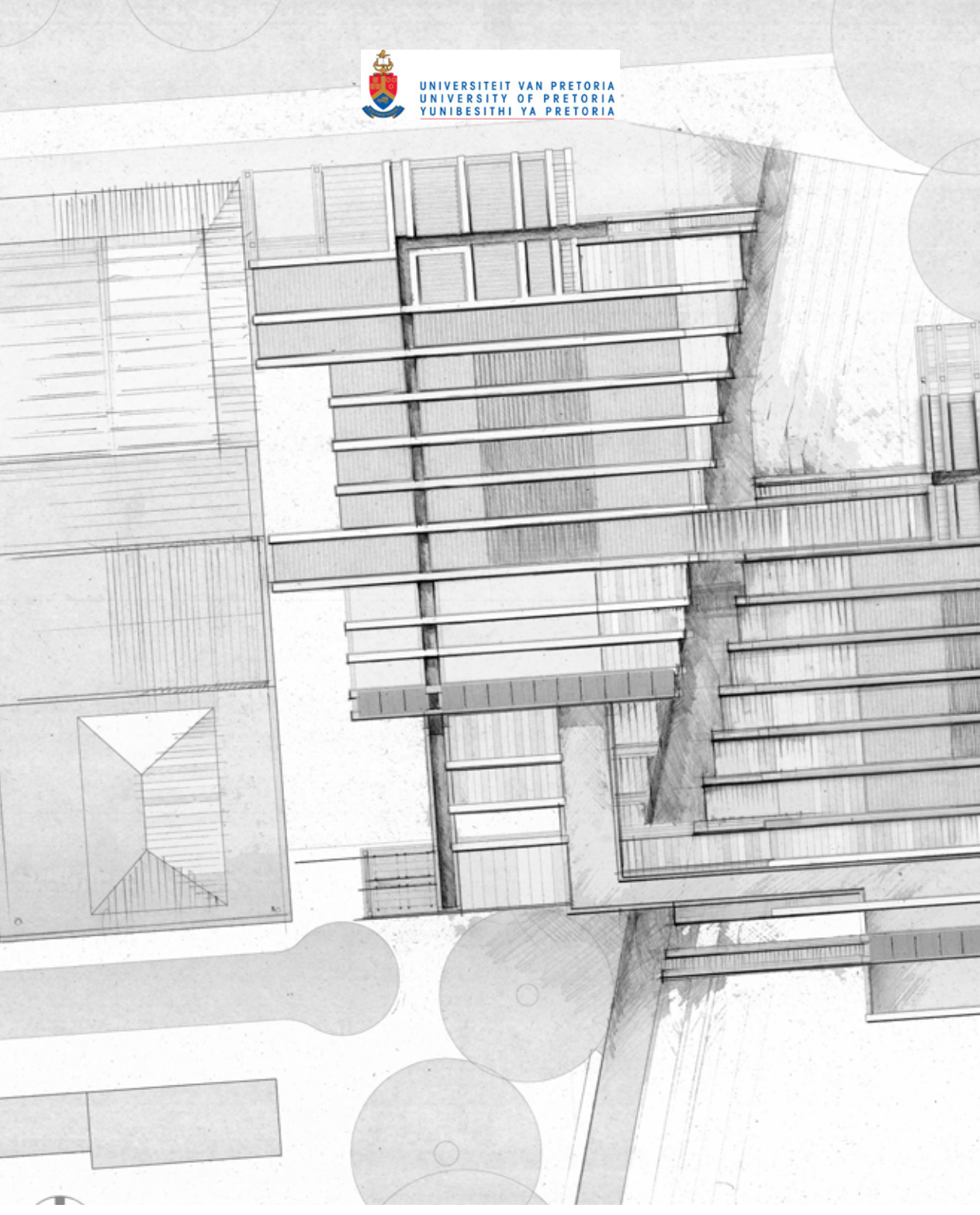
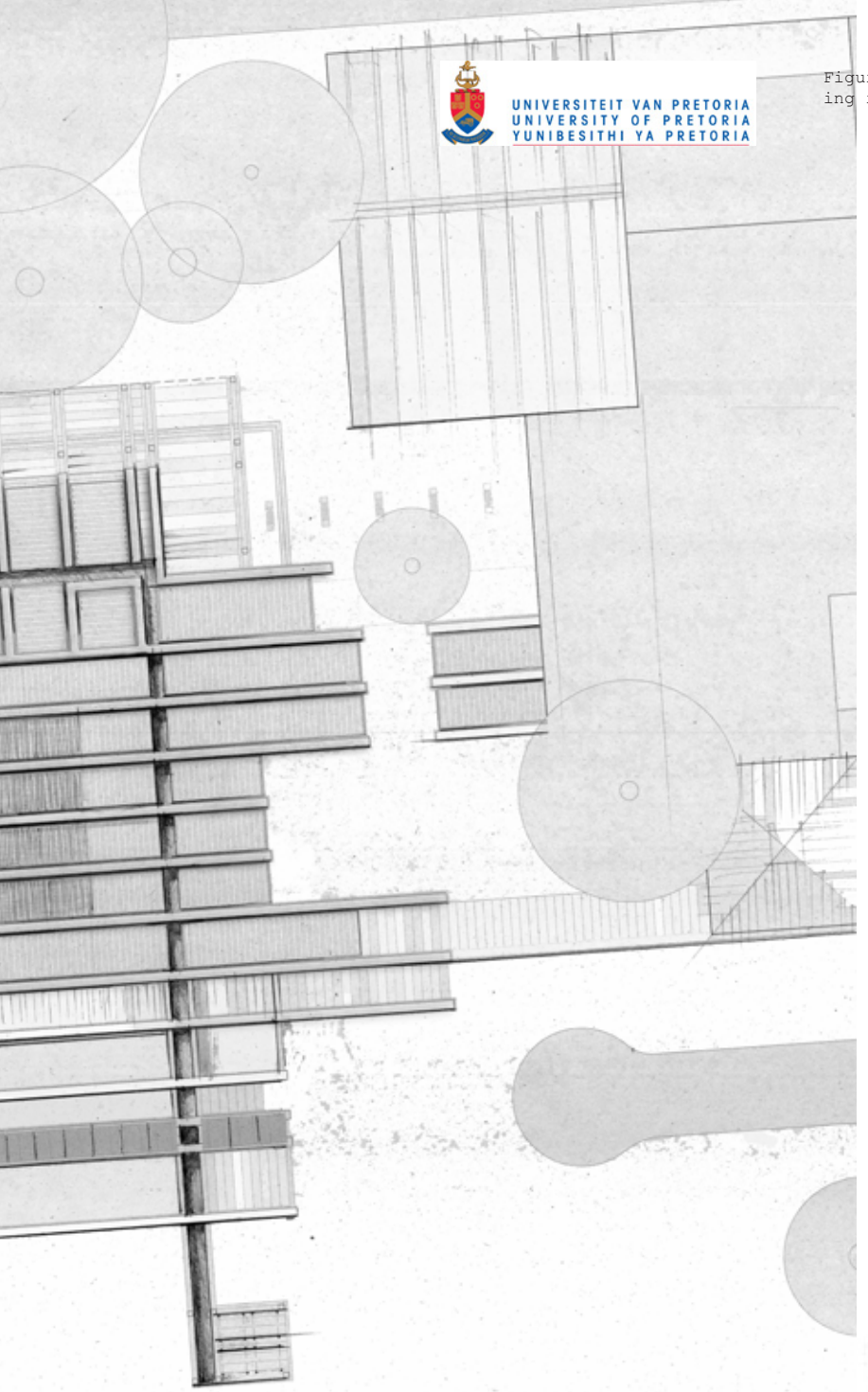
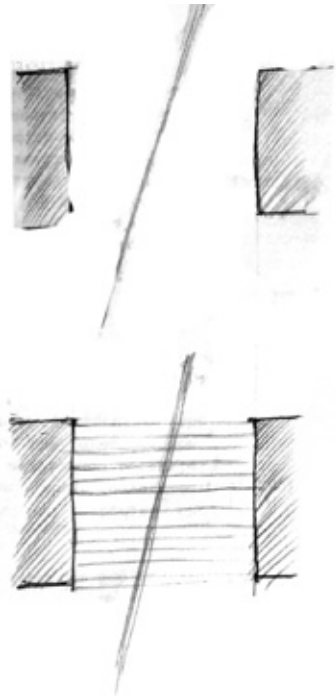
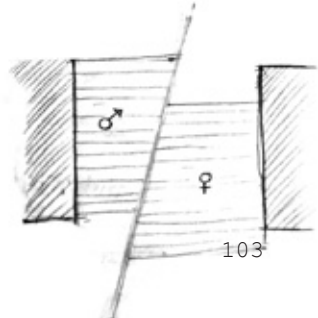


Figure 105. Collage including roof plan. nts.

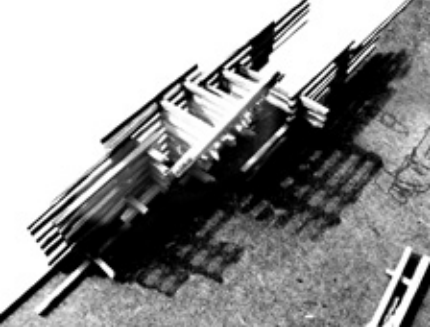




roof plan



section B-B



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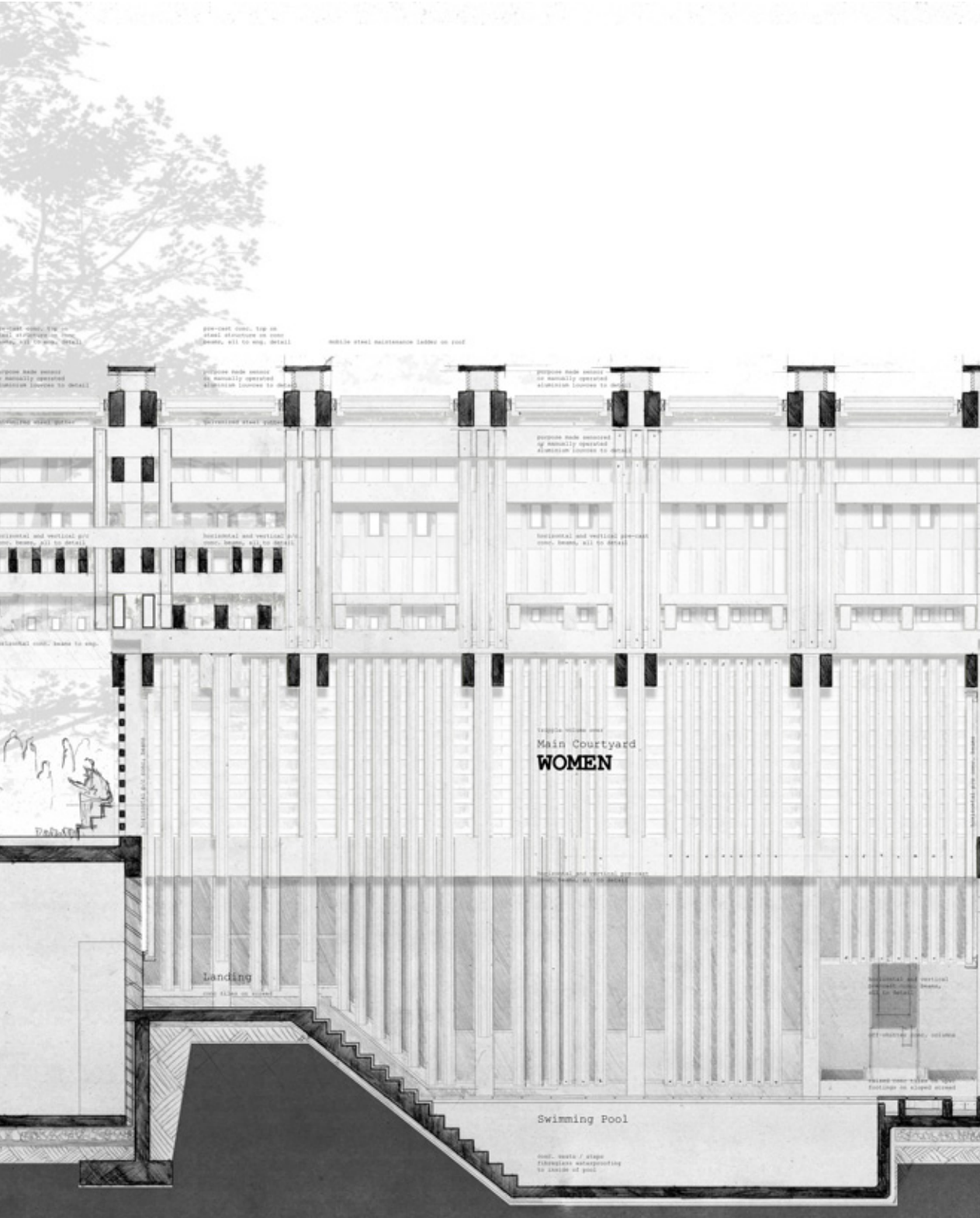
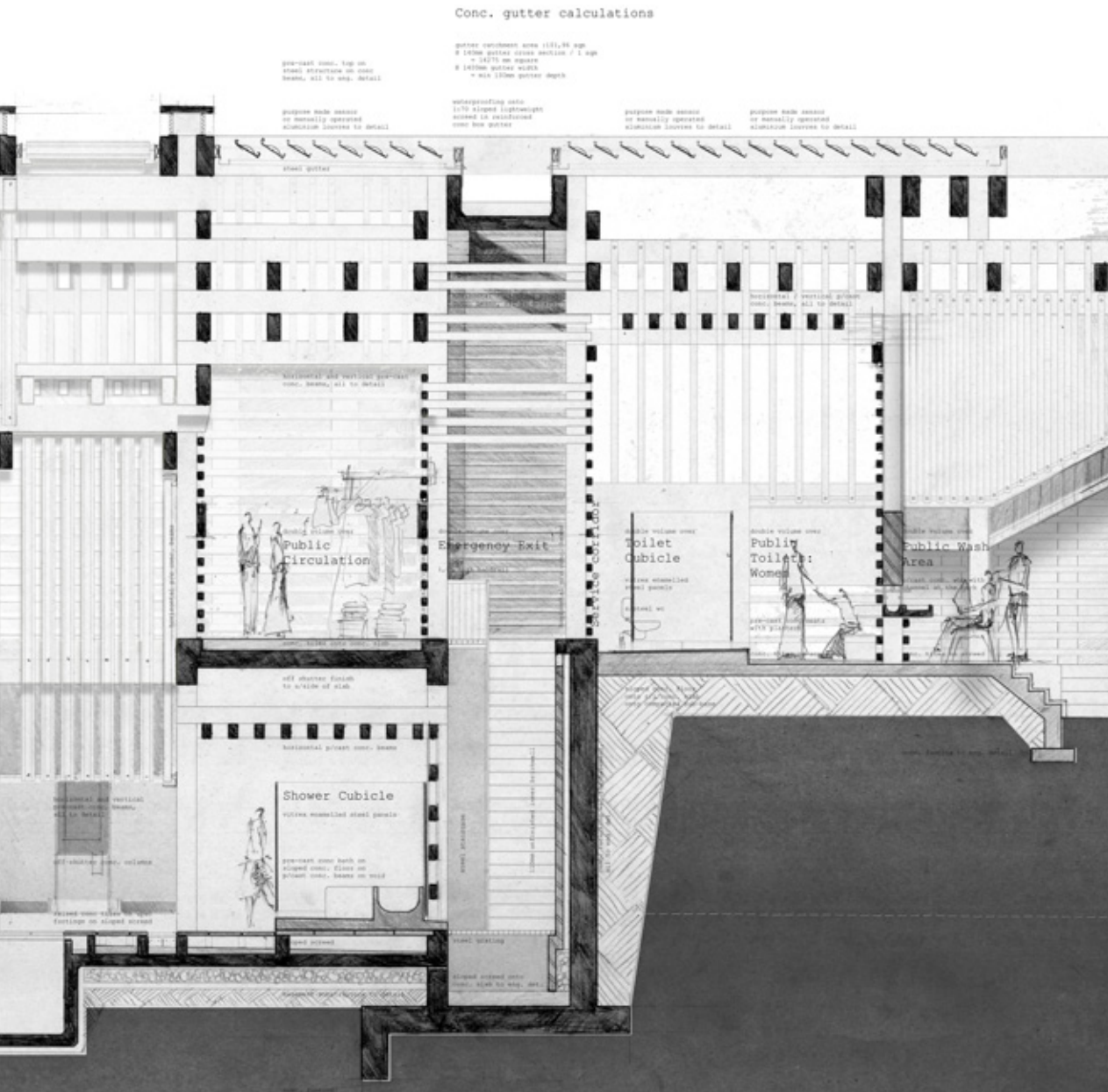
Beam span (l) relative to structural depth (d) expressed as a ratio of l/d between 20-38, for prestressed concrete beams.

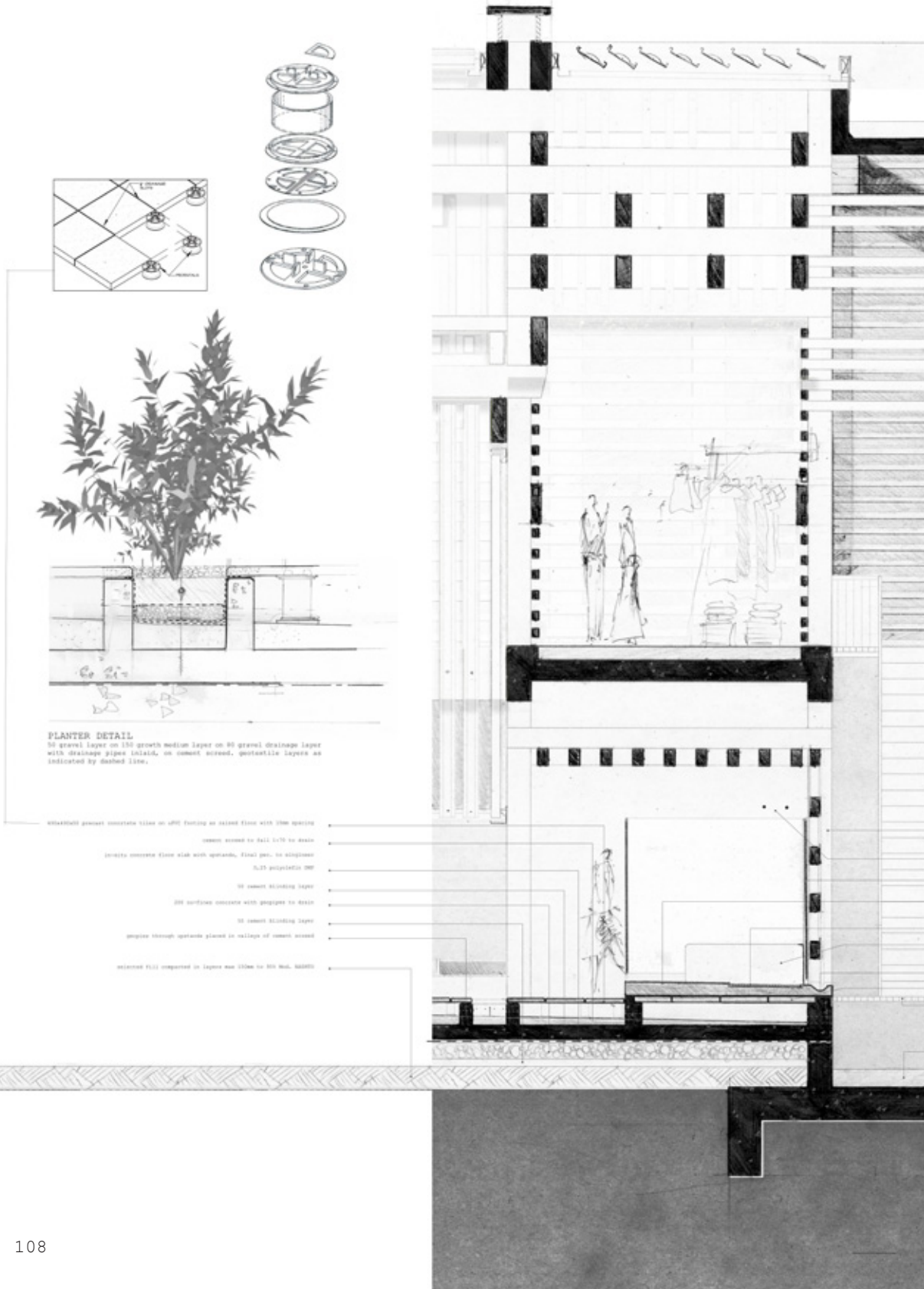
Beam span (l)	Beam structural depth (d)	Beam depth (mm)
7 150	358,5	360
2 700	135	135
3 500	175	175
4 500	225	225
10 700	535	585
5 300	265	265
5 800	290	300
1 000	50	50

Figure 106. (opposite, below and next page) Collage including section b-b. nts.



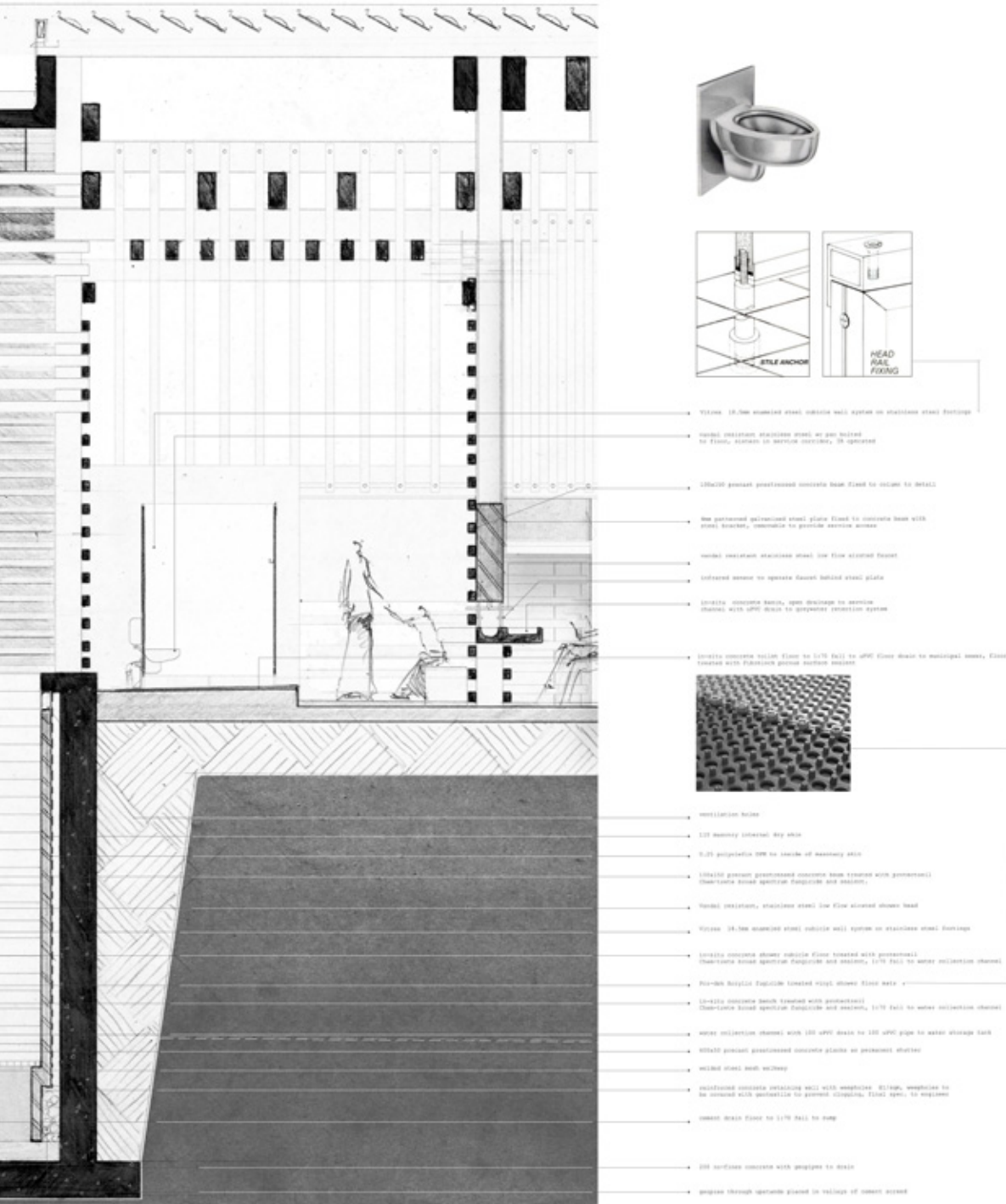

Conc. gutter calculations
Public Circulation
Emergency Exit
Toilet Cubicle
Shower Cubicle


Public Circulation
and Trading Area



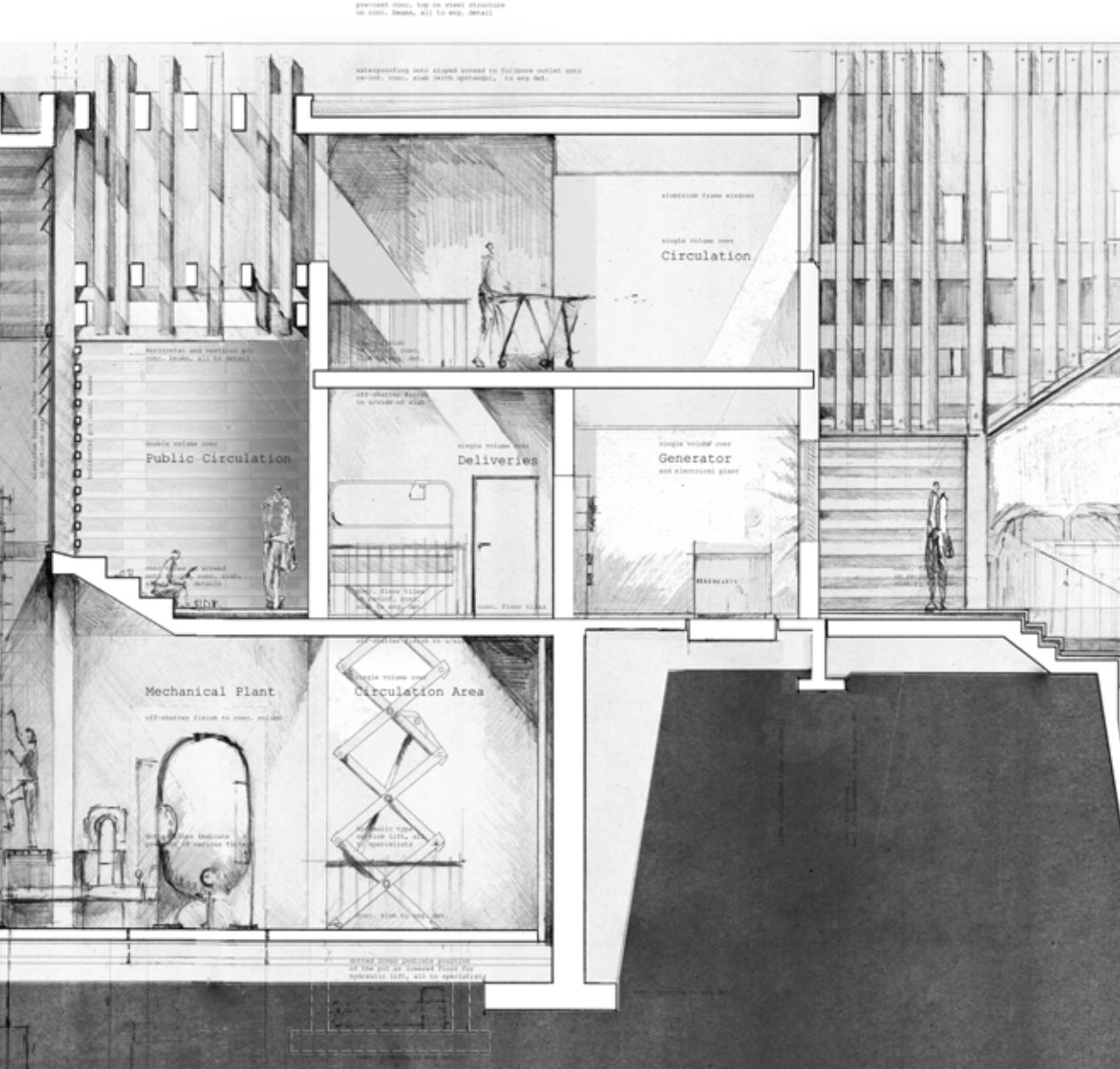
PLANTER DETAIL
50 gravel layer on 150 growth medium layer on 80 gravel drainage layer with drainage pipes inlaid, on cement screed. geotextile layers as indicated by dashed line.

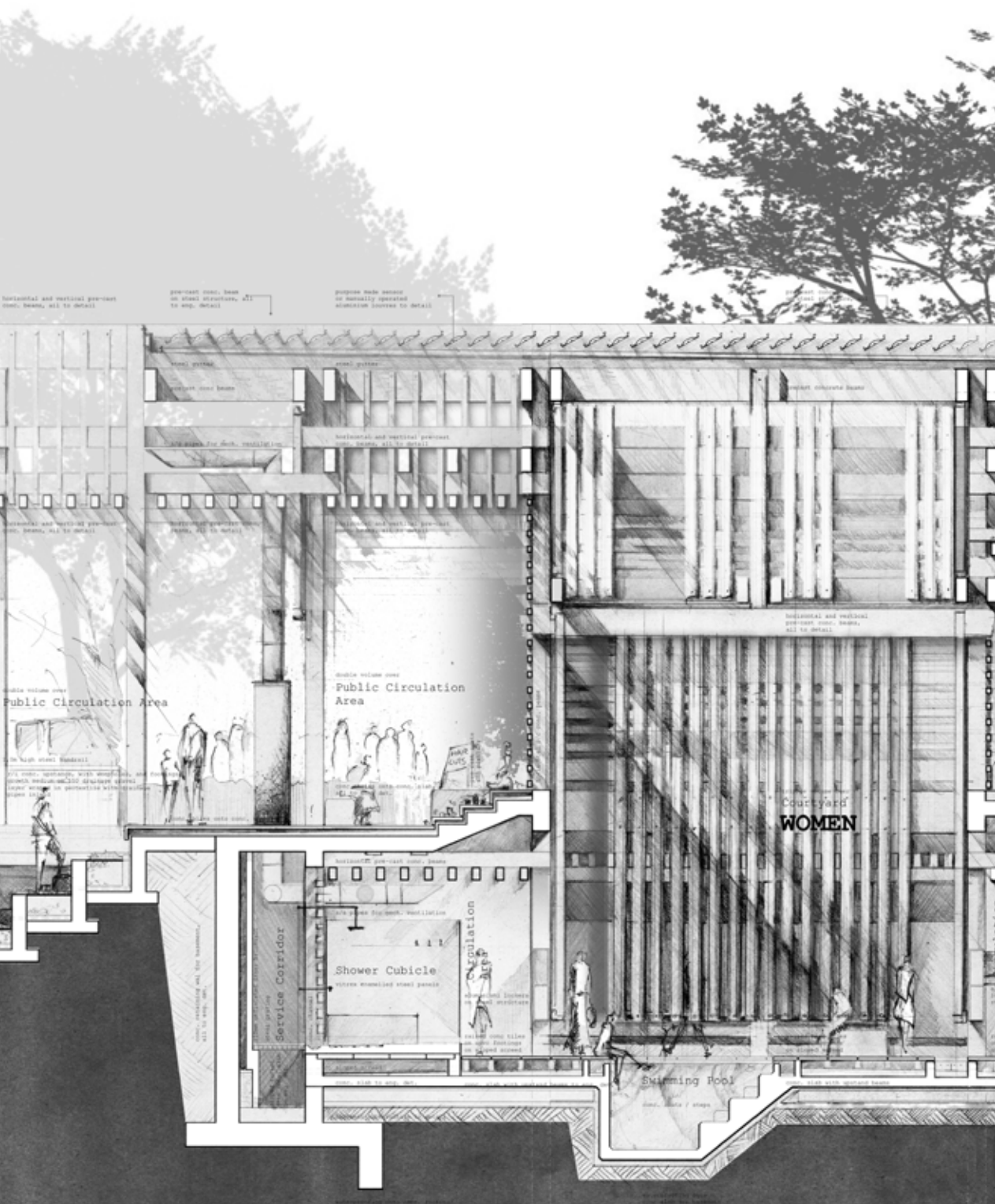
Figure 107. (including opposite)detail F. nts.



section C-C

Figure 108. (opposite, below and next page) section c-c. nts.




Public Circulation Area
Public Circulation Area
Courtyard
WOMEN
Service Corridor
Shower Cubicle
Circulation
Swimming Pool

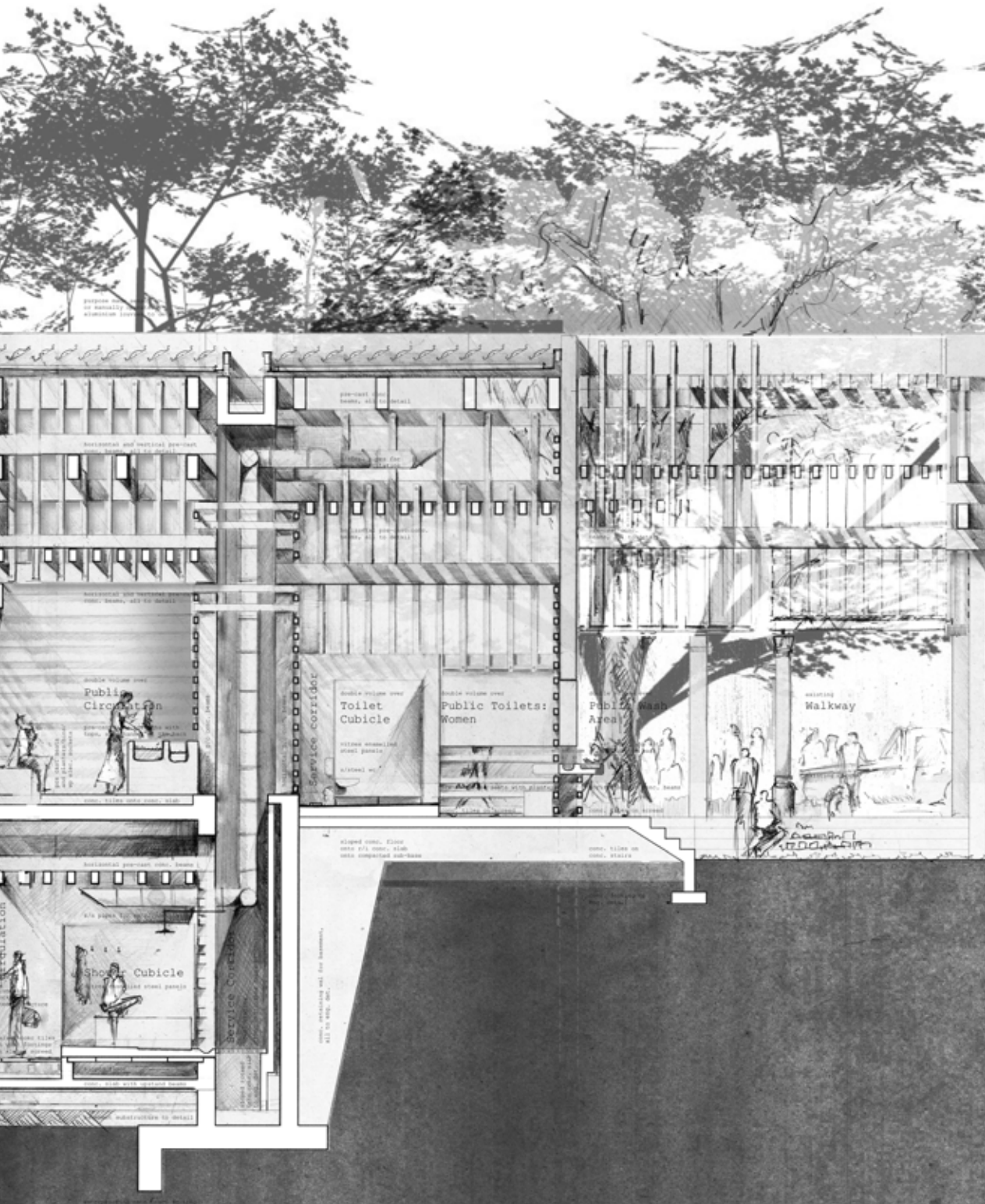
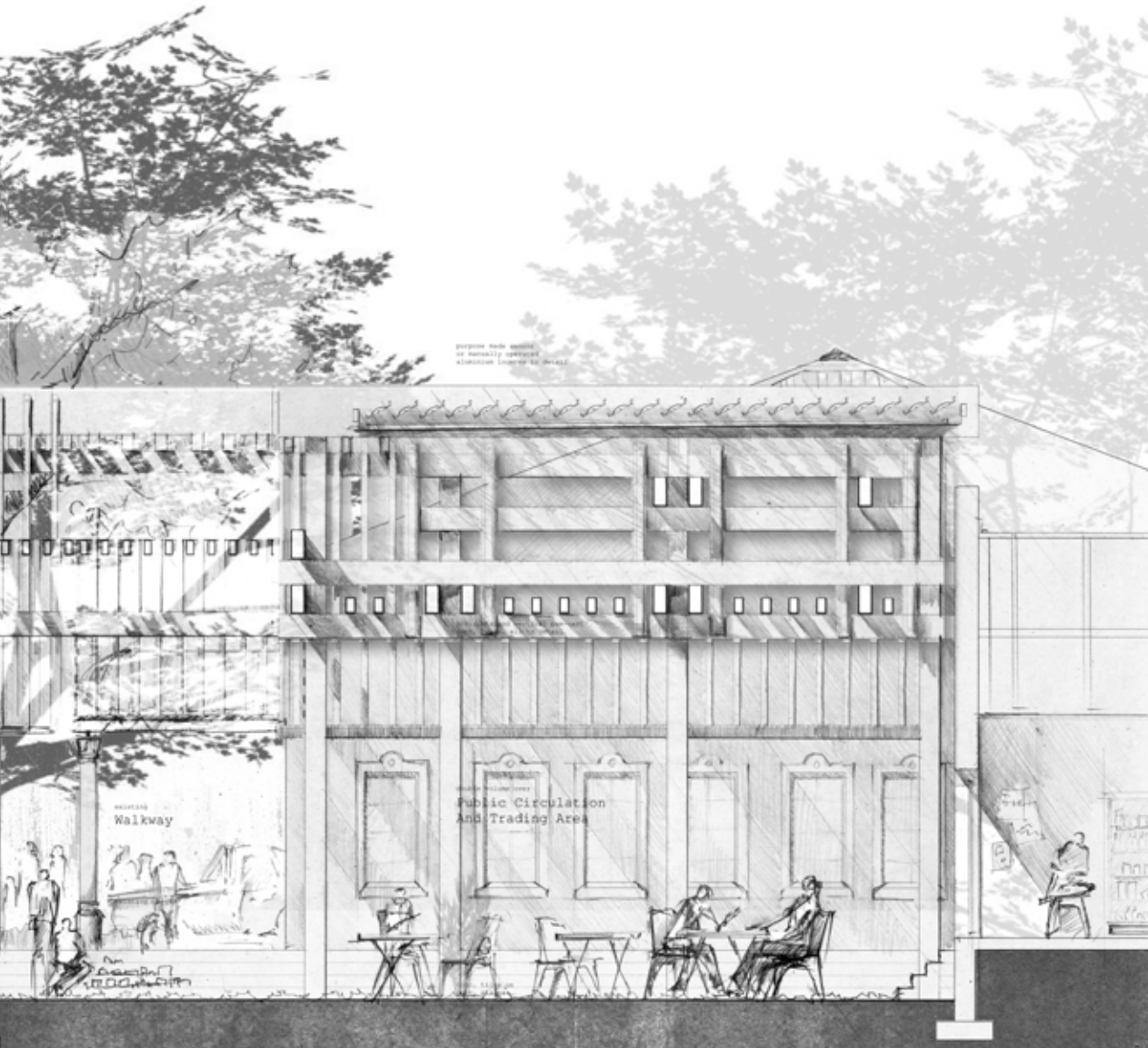
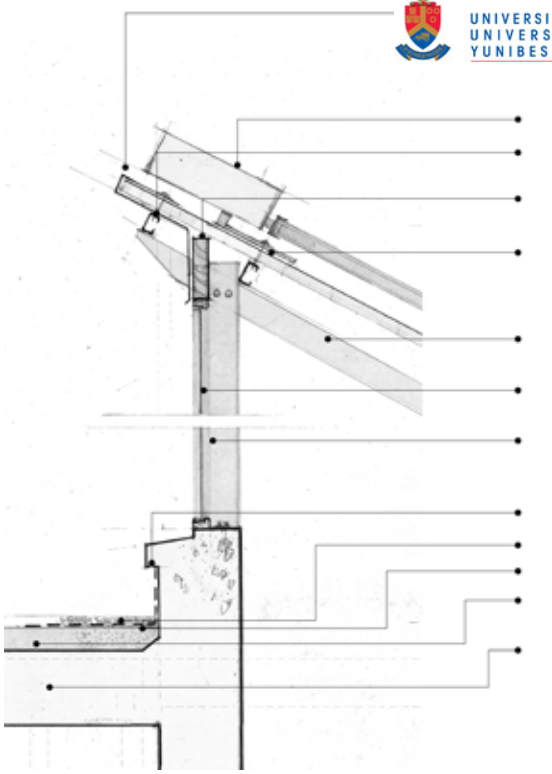

Toilet Cubicle
Public Toilets: Women
Walkway
Service corridor
Shower Cubicle

Figure 109. (opposite) details E,F,G and H. nts.





flashing

vacuum tube solar water heater at 25 degree angle, facing north mounted on roof construction. water heater fixed to manufacturer's bracket , bracket fixed too steel purlin through roof sheeting with roof screws

75x50x20x2,0 steel purlin fixed to steel beam with welded cleat @ max 900 cc spacing

50x200 SAP infill beam bolted to steel posts flashing to overlap bolted connection

0,6 galvanized steel s-profile galvanized steel roof sheeting fixed to steel purlins with roof screws

two 100x50x25x2,0 galvanized steel unequal angles as roof beams bolted to steel post

6mm laminated glass in aluminium frame installed to manufacturer's spec

76,20x38,10x1,60 galvanized cold rolled rectangular steel tube as post, fixed to concrete upstand with welded brackets and chemical anchor bolts

drip

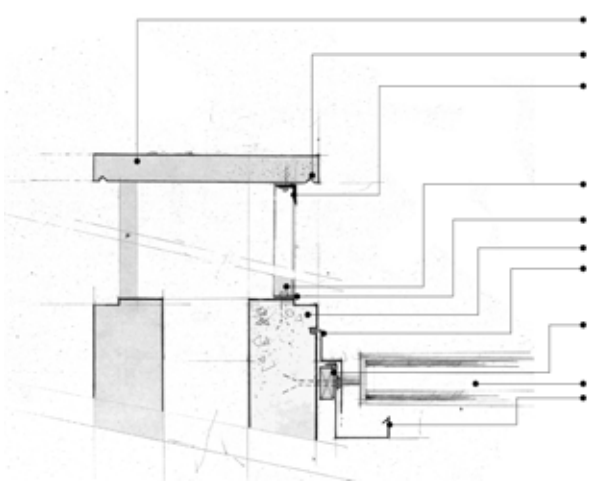
light colour gravel

0,25 polyolefin DPM

min 25 lightweight insulating screed to fall 1:70 to fullbore outlet

reinforced concrete slab to engineer spec.

detail E
nts



800x100 precast concrete planks onto steel frame, unfinshed.

drip joint

70x70x6 galvanized hot rolled steel equal leg angle to form welded frame onto which concrete planks are fixed using screws with expansion plugs. railing for puposes of securing maintenance workers welded onto steel frame

Expansion bolt to fix welded steel frame to precast concrete beam

silicone seal

250x585 prestressed precast concrete beam

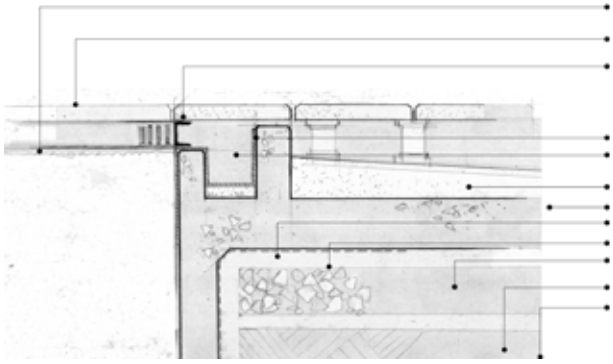
0.6 galvanized steel flashing set in recess in concrete beam to be filled with silicone. flashing fixed to timber support beam with roofscrews.

75x150 SAP support beam fixed to precast concrete beam with countersunk expansion bolts @ 1000cc

aluminium louvre with translucent insert to manufacturer

0.6 galvanized steel gutter

detail F
nts



water level

490x490x50 precast concrete raised floor tiles on uPVC footing

76x102x6,7 perforated stainless steel channel fixed to underside of concrete floor tile with chemical anchor bolts @ 2 per tile
concrete floor tile to rest on uPVC mountings set on concrete upstand

fibreglass pool wateproofing and finish to specialist

pool overflow channel catchment with floor at fall min 1:70 to drain to pump

cement screed at min fall 1:70 to drain

concrete floor slab, with upstands, unfinished, to engineer

0,25 polyolefin DPM

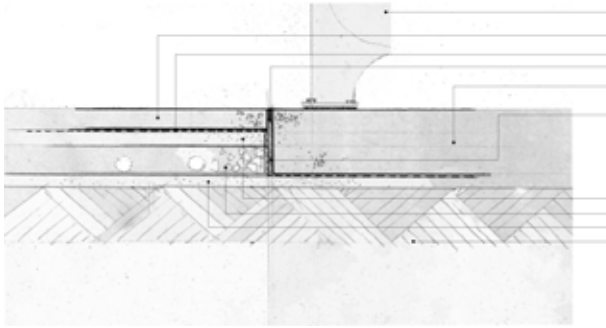
cement blinding layer

200 no-fines concrete with geopipes to drain to sump

cement blinding layer

selected fill compacted in layer max 150 to 95% mod-AASHTO

detail G
nts



detail H
nts

Figure 110. (left) collage of journey through Marabastad from Belle Ombre rail station.

Figure 111. (right) photgraph of building in Boom st.

Figure 112. (below) bathhouse in Boom st context.

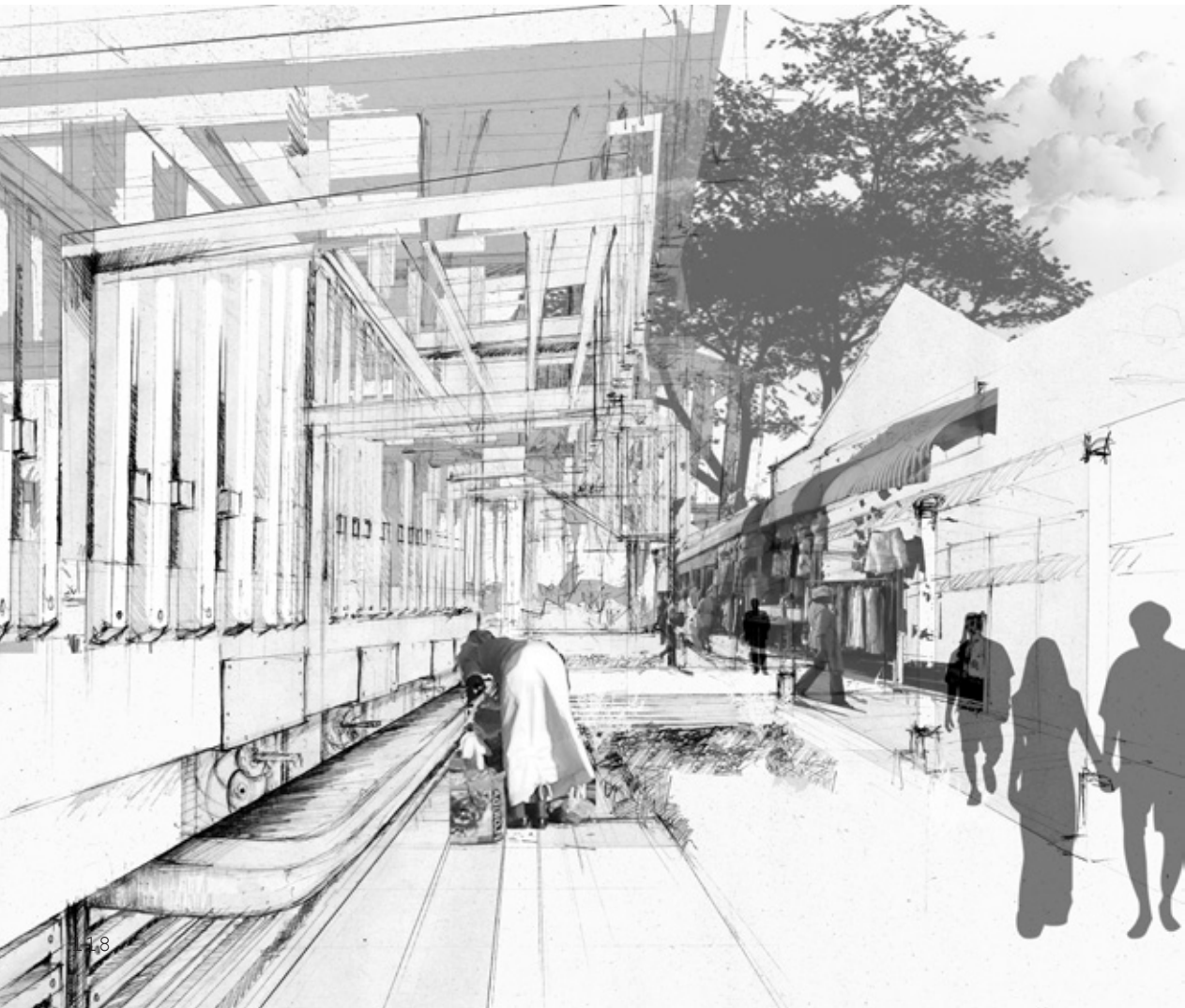

SMART-T.A
WHOLESALERS


STOP

Figure 113. (right) photographs of experiences directly related to bathhouse site.

Figure 114. (below) illustration of area between new and existing.

Figure 115. (below right) sheltered space.



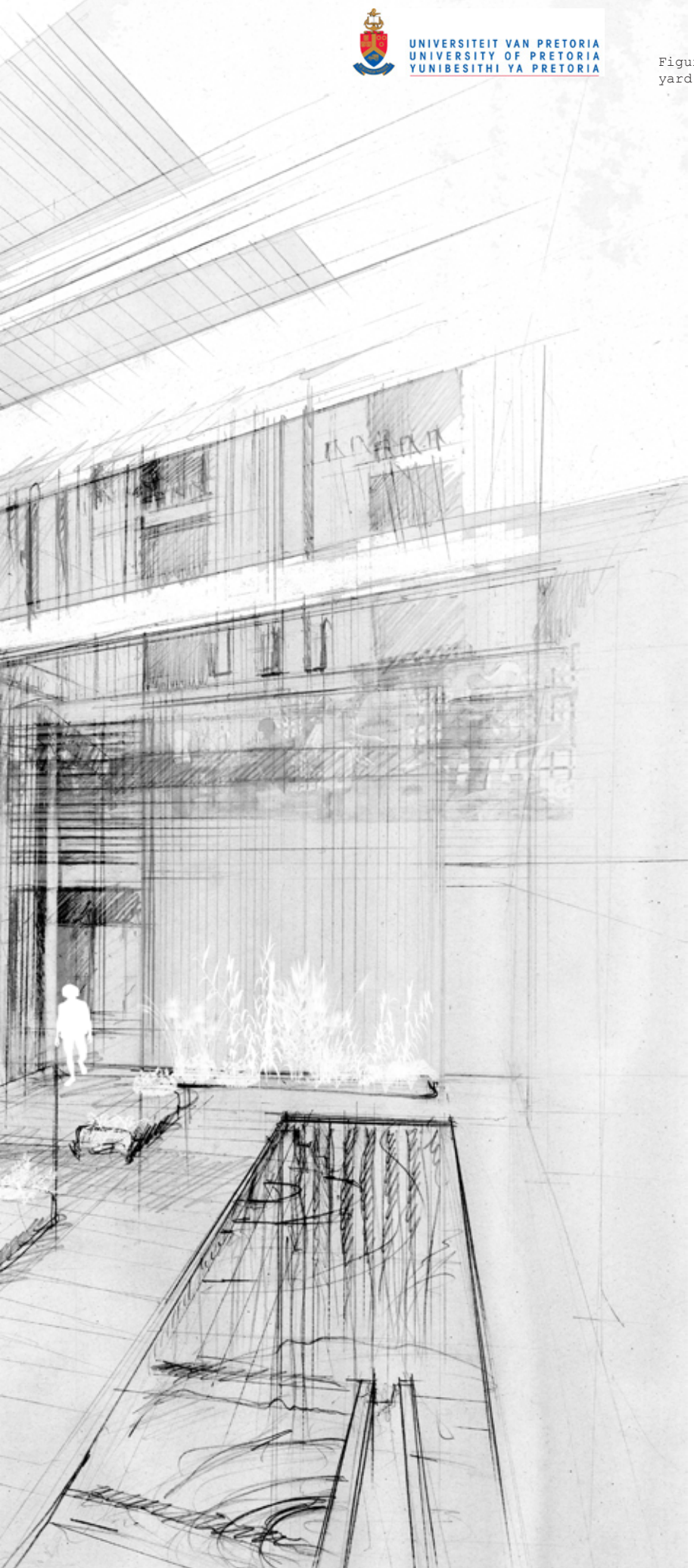
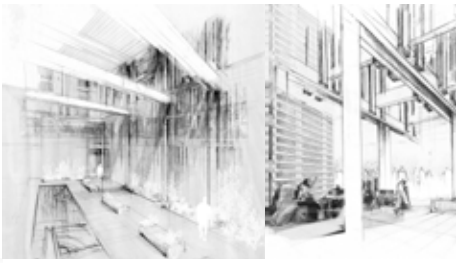


Figure 116. Central court-yard space



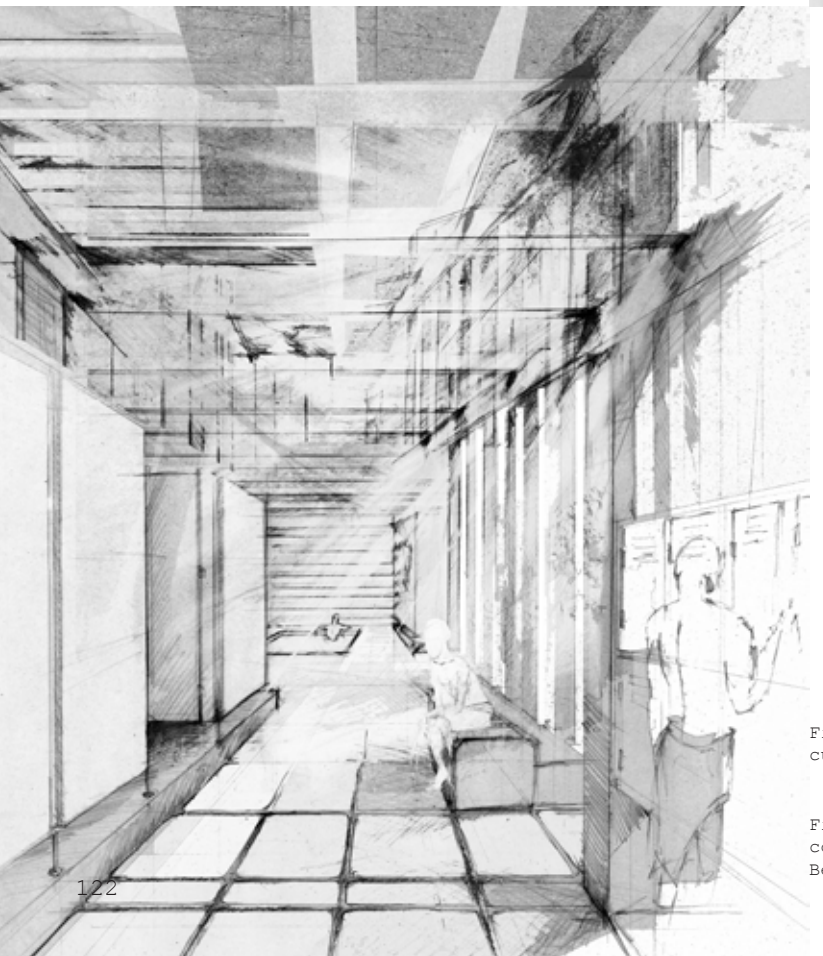


Figure 117. space between shower cubicles and courtyard.

Figure 118. (top and opposite) collage of journey from shower to Belle Ombre rail station.



Figure 119. (including opposite) collage of photographs of physical model.

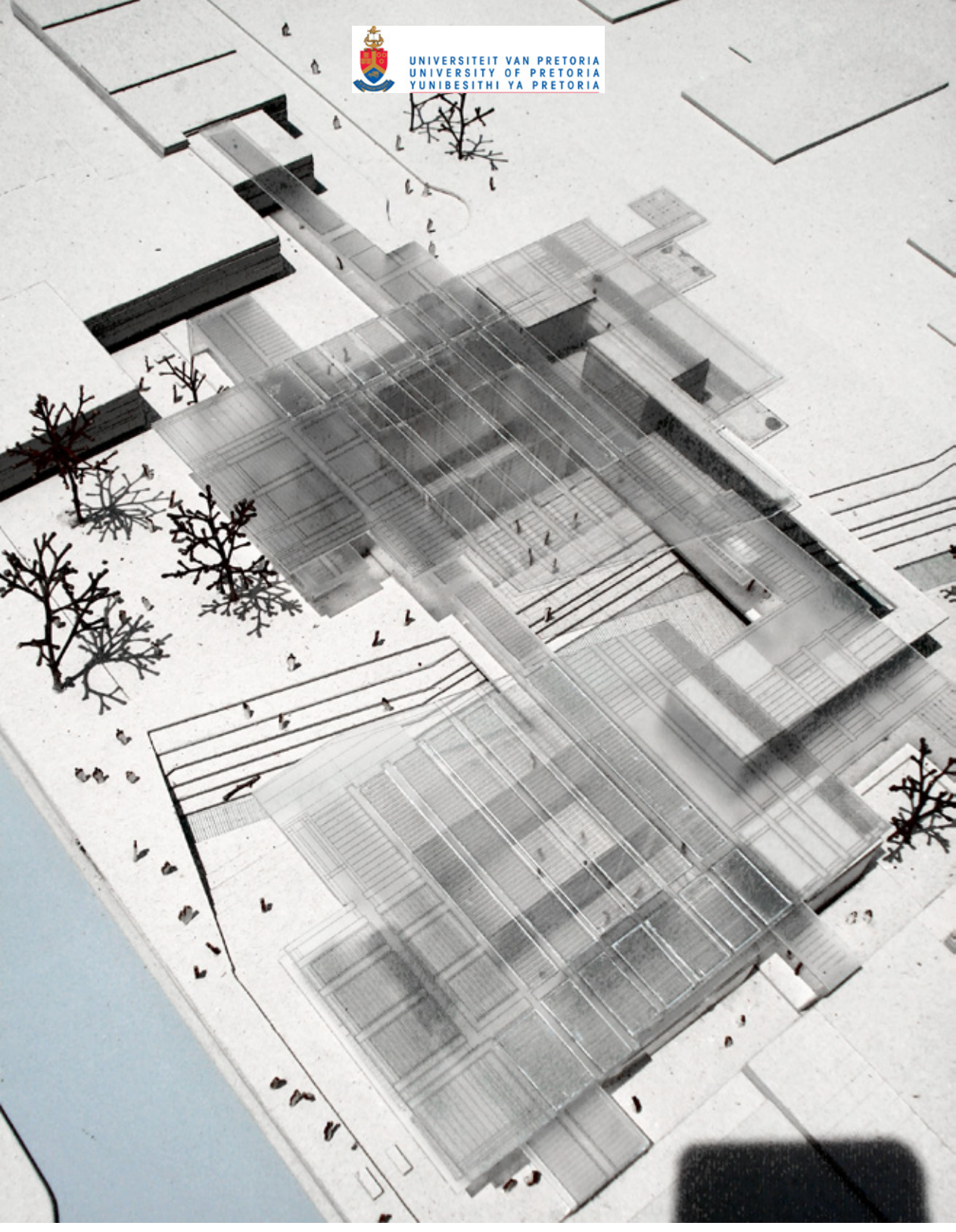

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Figure 120. (opposite) photograph of physical model.

Figure 121. collage of photographs of physical model.