

THE ROLE OF ARCHITECTURE IN FOSTERING HEALTHY CITIES

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requirements
for the degree Master of Architecture

DECLARATION

I hereby declare that the dissertation is my own unaided work. It is being submitted to the School of Architecture, Planning and Housing, University of KwaZulu-Natal, Durban, for the degree Master of Architecture, and has not been submitted before for any degree or examination at any other University.

Signed by on this 3rd day of October 2010

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Abstract

This research initiative explores the architectural response to the health implications of rapidly urbanising societies. The investigation looks at the concept of a healthy city as a facilitator for sustainable urban health by a holistic definition of the term. Here, health can be defined as a state of complete physical, mental and social wellbeing (World Health Organisation, 1985) which argues that health problems are embedded in complex features of urban life that fall outside the province for medicine. The relationship between architecture and health is explored by a chronological investigation of the process of urbanisation which uncovers key issues such as the degradation of the urban environment through intensification and automobile reliance. Furthermore, the destruction of the natural environment and the ignorance of the socio-spatial dimensions of human habitats have led to a series of physical and social health issues. The research identifies urban design and housing examples which promote urban health through a variety of concepts such as mixed-use development, the creation of social spaces and the creation of a legible and coherent urban fabric and focuses on the needs of the community. Essentially, the research points towards a social architecture that provides a series of community services and amenities to promote health as a holistic idea.

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List of Definitions

Epidemiology: The branch of medicine that deals with the study of the causes, distribution and control of diseases in populations (source: www.answers.com)

Communicable (diseases): those which are transmittable between persons or species, contagious (source: www.answers.com)

Non-communicable (diseases): those which are not transmittable between persons and species and are linked to risk factors in a person's lifestyle (source: www.answers.com)

Primary Health Care: the medical care a patient receives upon first contact with the health care system, before referral elsewhere within the system (source: www.answers.com)

Secondary Care: a service provided by medical specialists who generally do not have first contact with patients. Patients are usually referred to secondary care by their primary care provider (source: www.drfoosterhealth.co.uk)

Uroscopy: The examination of urine for diagnosis purposes (source: www.medical-dictionary.thefredictionary.com)

Introduction

“A healthy city is one which is constantly creating and improving those physical and social environments and expanding on those community resources which enable people to mutually support each other in performing all the functions of life and in developing to their maximum potential.” (Duhl & Hancock, 1988:1)

The development of human settlements through a process of urbanisation has manifested into the current day landscape of polarised, intensely populated ‘centres of living’. These centres are typically rich in activity, diversity and economic opportunity attracting the rural population who aim to capitalise on these opportunities and benefit from better accessibility to housing, jobs and health care. This population shift from rural to urban is an escalating global phenomenon common to first world countries although predictions are that the 21st century will see the developing continents such as South America, Asia and Africa experience rapid rates of urbanisation (Simone, 2001).

Africa exhibits a plethora of health challenges in its urban centres as a result of this rural-urban migration which has given rise to a number of social and physical health issues; and these issues are likely to compound as Africa experiences an unprecedented rate of urbanisation moving through the 21st century. The perception of cities as ‘islands of privilege’ offering living conditions and a quality of life superior to those experienced in the rural hinterlands is a contestable urban debate. Nevertheless, scores of migrants flock to the cities in an attempt to benefit from these perceived opportunities and find themselves in a competitive environment where jobs, affordable housing and social support services are limited. Life in the city environment is typically compromised by the competition for these amenities and it is well documented that this affects both the quality of the physical environment and the health status of the urban community.

This phenomenon is reason for an investigation into the relationship between the urban environment and the health of urban communities. A key motive for

looking at this issue is borne from the realisation that many health problems are embedded in complex features of urban life that fall outside the traditional province for medicine. This issue is particularly highlighted when considering the contemporary definition of 'Health' as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organisation, 1985). Therefore, there exists an opportunity to acknowledge the impact of the built environment on health based on this broader definition which enables us to explore this topic with particular relevance to architecture and urban design.

Urbanicity (Galea and Vlahov, 2002) is the study which investigates this relationship and explores the facets of urban living influencing health. Mead et al (2006) advocates that the built environment can be manipulated to influence a number of sociological activities such as physical and social interaction as the attributes of a city can potentially influence the health status of an urban population physically, socially and emotionally.

Therefore, this dissertation seeks to develop this understanding of the relationship between the urban domain and healthy communities as an essential discourse towards an architectural intervention.

Chapter 1: Research Background

1.1. Urbanisation and the Consequences for Urban Health

Cities are the physical manifestation of the process of intensifying human settlements known as Urbanisation. This process has resulted in a number of associated health issues and challenges which is facilitated by the composition, structure and morphology of the built environment. Urbanisation is not inherently positive or negative although a lack of regulation and discourse managing the effects of urbanisation has provided a human habitat with a negative impact on the health status of urban communities. This phenomenon is augmented by the predictions of a rapid increase in the number of urbanised settlements in the near future and this dissertation seeks to investigate this relationship in order to suggest the relevant interventions.

1.1.1. Introduction to Urbanisation

Urbanisation is arguably the most significant demographic shift worldwide of the past century and represents a sentinel change from how the world's population has lived over the past several thousand years (Leon, 2008). The emergence of the city represents the current day morphology of earlier permanent Neolithic habitats such as villages and small country towns and is closely linked to the social, economic and technological progressions of mankind over time.

Cities have typically developed through a symbiotic relationship with the availability of resources needed for cultivation, consumption, manufacture and transportation; while sometimes limited to the abundance of these resources. Despite this, the possibility of active engagement with newer neighbouring markets has evolved with the development of technologies in transportation and cultivation and promoted the supplementation of this domestic product shortfall (Mumford, 1956). This inherent relationship between the growth of cities and technological discovery such as Industrialisation and Modernisation can be seen when considering the characteristic size of cities in Western Europe in the 16th century as ranging from 2 000 to 20 000 while the 17th century saw cities develop to over 100 000 inhabitants (Mumford, 1956).

Currently, the largest cities accommodate populations in the tens of millions (www.worldatlas.com) as the world has shifted from the rural based collection of small cities, towns and villages to the contemporary existence of metropolitans which include megacities and vast tracks of sprawling urban land.

In essence, over half the world's population reside in cities as the shift from the rural to the urban economy intensifies. This number is expected to increase by 20% over the next 40 years (World Health Organisation, 2010) which will see a rapid increase in the number of people living in cities, especially in the developing world.

1.1.2. Urbanisation in Africa and the Implications for Health

Africa is a rapidly urbanising 'developing' continent with a number of significant cultural, political and economic circumstances which is due, in part, to the legacies of its Colonial Heritage and to the intense political and economic climate (Fay and Opal, 2000). Fay and Opal (2000) write that urbanisation is usually accompanied by sustainable growth although in the case of Africa, this phenomenon is ignored. Furthermore, in times of economic downturn, the poor and migrant population do not necessarily return to the rural areas and continue to reside in the urban areas. Here, the rate of urbanisation has outpaced Governments' ability to provide essential infrastructure and could potentially intensify an existing humanitarian crisis linked to the state of the urban environment, living conditions, healthcare and economic sustainability.

The consequence to Africa is a continent plagued with cities which are overcrowded and underdeveloped exhibiting a landscape of 'sprawling' urban peripheries, slums and urban decay. The absence of basic amenities such as sanitation, waste management and water supply promote squalid living conditions contributing to the 'health risks' associated with cities and certainly affect the quality of the urban physical environment (Fay and Opal, 2000).

There are a considerable number of risks associated with the urban environment which negatively impact the epidemiological status of urban populations. Disease and urban syndromes, crumbling family infrastructure, family and community disruption and the lack of social and physical interaction are not addressed exclusively through medical solutions. This idea challenges the provision of healthcare and medicine as the only solution to managing the prevalence of disease and ill health brought on by the conditions of the urban environment. Furthermore, this challenge is amplified when considering that urbanisation is associated with a number of non-communicable diseases such as hypertension, obesity, diabetes and cardiovascular disease. The rise of non-communicable diseases is being driven by vast social and economic changes of which urbanisation is a critical dimension (Leon, 2008).

1.1.3. Learning from International Examples

Key to this investigation is an awareness that urbanisation is a process which is well documented and, in effect, pioneered by first world countries in North America, Asia and Europe. The city is a product of growth rather than instantaneous creation and these countries are precedent to the issues and complexities faced by a rapidly urbanising Africa and could provide potential solutions and interventions.

1.2. Intentions and Key Questions

The health of urban populations has evolved with the development and progression of cities and the changing urban landscape, indicating a direct relationship between the two. This relationship is articulated through the study of 'urbanicity' which refers to the impact of 'city living' on the health of the population within three broad schemes; the physical environment, the social environment and accessibility to healthcare and social services. This draws from the study of ecology, sociology and epidemiology (Galea and Vlahov, 2002) and suggests that the term 'health' is a broad concept as it can be affected on a physical, social and emotional level. Today, we understand that diseases are the result of a complex series of interactions between human factors, including genetics and health behaviour and the ecosystems in which humans live (Lopez, 2009). A contemporary impression of the city is that they

are the physical expression of the societies that build them and who therefore display an inherent visceral connection to their environment. The extent of this connection is a critical dimension in sustaining an ecological balance between communities and their urban habitats.

1.2.1. Understanding Health

A contemporary definition of health speaks of a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organisation, 1985). Health is defined as an holistic term and is not determined exclusively by epidemiological status or the circumstance of illness. The societal shift from a rural to a predominantly urban one is accompanied by vast changes in many phases of social life (Wirth, 1938) and has led to the development of social ecological theory which looks at the relationship between individuals and their habitats and is defined by a number of models for sustaining a human ecological balance. This field of study focuses on the social, institutional and cultural contexts of, in this case, the city and looks at the dynamics of human health in the development of effective strategies towards promoting personal and collective well-being. Therefore, the context of the city is multi-faceted in its ability to manipulate and affect health.

1.2.2. The Link between Architecture and Health

Hence, the opportunity exists to explore the link between the built environment and the health of urban communities based on this broader definition of health. The research sets out to explore the changing urban-health link which is relevant to South Africa as it will be exposed to new and traditional urban issues impacting on health as the continent experiences an unprecedented rate of urbanisation. The investigation will look at how the development of urbanisation and increasing densities has influenced the health of the urban population through the natural and physical built environment. Mead et al (2006) advocates that the built urban environment can be manipulated to influence human behaviour, activity and social interaction which are key to sustaining a healthy community and motivates the exploration of this relationship with particular relevance to architecture and urban design. The

idea of a 'healthy city' is expressed through this relationship between the urban domain and health and this dissertation sets out to explore and identify those characteristics of a city which stimulate and promote health through architectural interventions.

1.2.3. The Research Question

The working hypothesis suggests that the urban physical environment, which includes the built and natural environment, can be articulated to promote the health of urban communities based on a broader definition of the term 'health'.

The ultimate intention is to develop an understanding of the role of architecture in the fostering of healthy cities through a chronological survey of the impact of cities on health and an exploration of human ecology as a determinant of health. The research will look towards local solutions to the burgeoning health challenges of urbanisation in South Africa.

1.2.4. Key Questions about Health and the Built Environment

A primary research initiative is to add to the discourse in the relationship between cities and health with particular relevance to architecture and urban design. Furthermore, an exploration of this topic will:

- Develop an understanding of the impact of cities on health through an investigation of the urban-health link with particular relevance to a broader 'holistic' definition of health
- Explore the effects of urbanisation on city life and health (urbanicity)
- Develop principles and theory which promote the built environment as a facilitator for health
- Identify international and local concepts relevant to the debate and currently servicing the issues of urban health
- Determine the appropriateness of the concepts within the local context

These intentions therefore suggest a number of key questions and preceding issues which should be investigated in order to establish the dynamics of this relationship.

Determinants of Health (Physical and Non-physical)

As previously mentioned, a state of good health is achieved and determined through complete physical, mental and social well-being and not merely the absence of disease (World Health Organization, 1985). The link between these three determinants in maintaining a state of well-being will be explored in determining how they are affected by the natural and physical urban environment.

Typical Urban Diseases and Health Issues

A key issue is determining the prevalent urban health issues potentially uncovering their inception within the urban environment. These urban health issues are categorised as communicable and non-communicable with regards to epidemiological status and include mental, physical and social issues within the broader definition for health and well-being.

Current Projects and Concepts Promoting Urban Health

A central element to exploring the urban-health link is determining the notable contemporary concepts and movements relevant to sustaining urban health and healthy cities. These ideas will be discussed in the literature reviews and explored in the precedent and case studies.

The Development of Early Cities (History of Urbanisation)

McKeown (1976) writes that most of the major factors in the improvement of urban health are a result of certain social, environmental and economic changes and interventions as opposed to advances in medicine. An investigation into the development of early cities and the history of urbanisation will disclose an incremental development of the link between health and cities which will identify past issues and reveal the interventions used to combat these problems.

Attributes of the Urban Physical Environment

Key to determining the fundamentals of the relationship between cities and health is determining those attributes and conditions which are intrinsic to the urban physical environment.

1.2.5. Broader Issues

Defining a Health City

This dissertation is suggestive of the city as a facilitator for health and well-being and establishes the idea of a 'healthy city'. The relevant components and parameters that will outline the qualities of a healthy city will be explored with particular relevance to the writings of key theorists such as Lynch and Doxiadis. These parameters will be analysed relevant to their architectural manifestation in order to develop the theoretical framework.

'Health Lifestyles' as a Contributor to Health

'A healthy lifestyle is a valuable resource for reducing the incidence and impact on health problems, for recovery, for coping with life stressors and for improving quality of life' (Langille & Lyons, 2000:13). A healthy lifestyle includes a number of health promoting activities which can be facilitated by the articulation of the built environment which can be manipulated to influence human behaviour and activity (Mead et al, 2006).

Human Ecosystem Models

The study of human ecology and the relationship between inhabitants and their environment is informed by a number of human ecosystem models which incorporate a variety of natural and social sciences to determine the state of health for an individual. The investigation will look at the diversity of the relationship between the physical, emotional and social determinants of health and suggest their relevancy to the built environment.

1.3. Understanding Health and the Built Environment

1.3.1. Components of the Built Environment

In literal terms, the built environment is defined as the part of the physical environment that has been constructed through human activity and consists of the following elements; land-use patterns, the distribution across space of activities and the buildings that house them, transport systems, physical infrastructure (roads, pavements, bridges, corridors) as well as the service this

system provides including urban design and the arrangement and appearance of the physical elements within a community (Boarnet et al quoted by Handy & Saelens, 2008). Here, each aspect of the built environment is designed to fulfil human purpose and the urban realm is the most complex example of these environments. On a pervasive level, the built environment can be defined by four interrelated characteristics:

- It includes everything which is human-created, modified, constructed or maintained and provides a context for human endeavours
- It is the creation of human minds and the result of human purposes intended to serve human wants, needs and values.
- It is an environment which can be mediated or changed for comfort and wellbeing and to protect us from the overall environment
- Every component of the built environment is shaped by context and the quality is affected by the individual elements.

The following diagram is an adaptation of Bartuska's (2007) definition of the built environment which explains graphically how the built environment is human derived and regulated in order to fulfil human requirements (social, economic, practical) and is a response to its location and context.

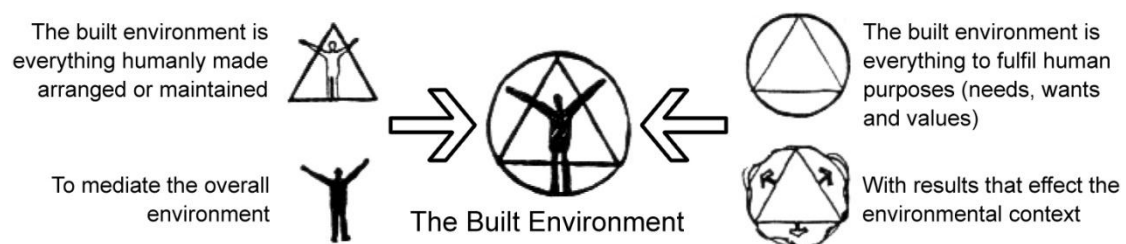


Figure 1: Bartuska's Model: A pervasive definition of the built environment

Furthermore, it is characterised by several key components and the relationship between these (Earth, regions, cities, landscapes, structures, interiors and products) is pertinent to the prosperity of a particular habitat.

Earth

The earth is essentially a collective of the following components which are experienced as a series of connected layers which are interwoven to form the built environment.

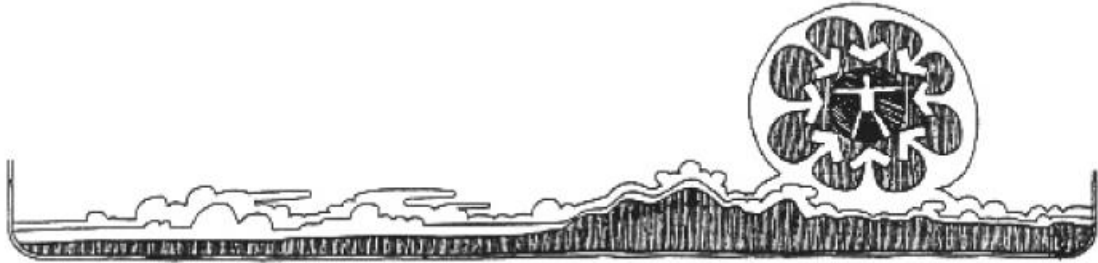


Figure 2: Sketch showing Earth as a collection of components

Regions

Groupings of cities and landscapes of various arrangements and complexities are regarded as regions and are defined by common political, social, economic and environmental conditions.



Figure 3: Landscape sketch showing the regions within the landscape

Cities

Cities are a collection of these structures and landscapes and are a development of a greater community based on economic, cultural, social and environmental progressions. These include neighbourhoods, districts, villages, towns, cities and megacities.



Figure 4: Sketch showing a city landscape

Landscapes

Landscapes are external spaces or planned groupings of spaces and structures and generally combine both natural and built elements and are seen as spaces in between buildings or structures which usually facilitate

recreation, congregation and interaction. These spaces include courtyards, parks, gardens, shopping centres, squares, farms, forests etc.

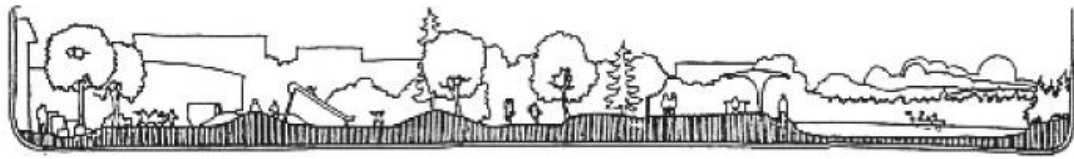


Figure 5: Sketch showing the landscapes of the built environment

Structures

These are planned groupings of spaces which are developed and constructed by products and furthermore accommodate such products. Here, related activities are grouped into composite structures which are defined by both internal spaces and external form. These include houses, schools, offices, churches, factories, highways, tunnels, bridges etc.

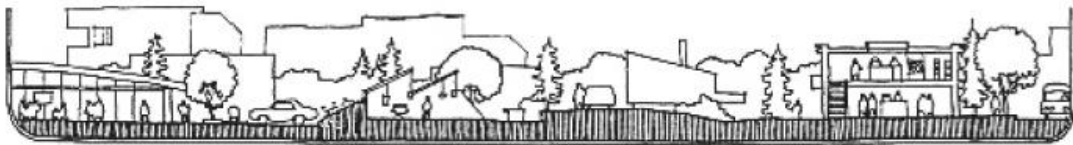


Figure 6: Sketch showing the structures within the built environment

Interiors

Interior spaces are generally defined by the articulation of a surrounding structure and developed to accommodate a variety of products necessary to fulfilling a series of needs. These spaces include living areas, workrooms, private rooms, shops, public venues, halls, stadia etc.

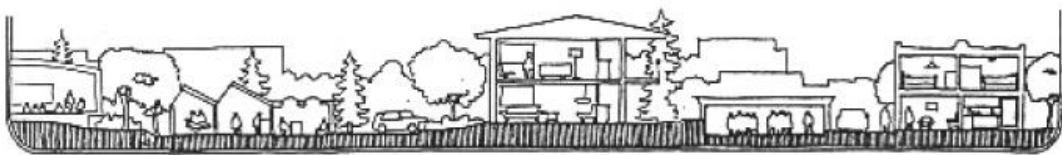


Figure 7: Sketch showing the interiors of the built environment

Products

These include materials and commodities and are devices which are created and utilised to extend the human capacity to perform specific tasks and to prosper in everyday life. Materials, tools, furniture, machinery, transportation and technological and communication devices are micro elements of the built

environment which are developed in conjunction with the surrounding context and are utilised and manipulated by our environments.

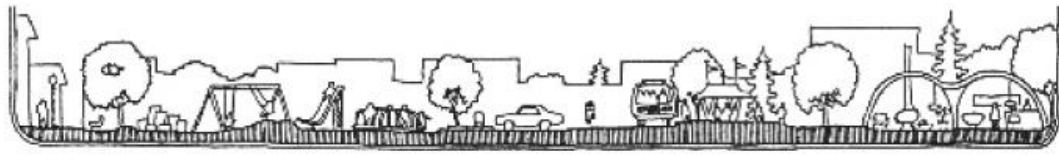


Figure 8: Sketch showing the products of the built environment

These components are understood as a series of layers which are interconnected and relative to one another in forming the built environment. This model suggests that there is an integrative linkage between the content, component and context and that the exploration of the built environment as a facilitator for health can be explored at each of these levels and should not be restricted to buildings per se. That is, the built environment can be explored in terms of urban design, town planning, building design (architecture) and interior design or in terms of the macro and micro dimensions of the built environment. The dynamic relationship between the elements within these environments forms a *genius loci* or 'spirit of place' which are a critical to sustaining health as a holistic concept. The research should then consider the city as a composition of the architectural elements (structures), the spaces between these elements (landscapes) and their internal qualities (interiors).

Bartuska's model touches on the co-existence of public, private and semi-private spaces through his definition of interiors, structures and cities although at this point the research will include the public realm as a complementary dimension and subpart to the facilities incorporated within these components. A reason for this is that the public realm is a space within a city that provides opportunities for public interaction (Mammon & Paterson, 2005) which is a significant attribute of a healthy city.

1.3.2. Urban Health and the Public realm

The public realm is a 'negotiated' domain which comprises the spaces outside of the private and semi-private domains and includes public facilities, public open spaces, institutions and green open spaces. It 'provides a platform for

interaction, debate, contestation, dialogue and celebration' (Mammon & Paterson, 2005:2) and provides venues to address critical issues such as education, social development, health and healing collectively. Furthermore, it provides spaces for relaxation and recreation which is at a premium in urban environments and contributes to community cohesion and social capital which are key to maintaining social wellbeing. The public realm will be explored later in the research as a facilitator for health although the current explanation motivates the existence of the relationship; further clarification of the definition of health and determinants of health are needed in order to develop and explain this relationship.

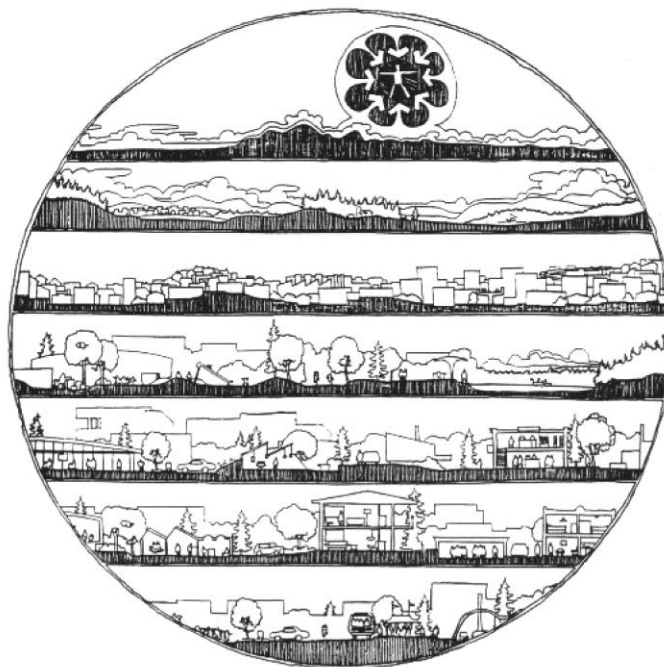


Figure 9: Sketch of the composition of the built environment

1.3.3. Health as a Holistic Concept

A contemporary understanding of health is philosophised by an acknowledgement that health is a universal term which is not necessarily managed through a reductionist approach of disease prevention and treatment through medical intervention. That is, health is a holistic term and is regulated and achieved on a number of physical, social and interpersonal levels and not merely through the practice of medicine. Here, it is important to mention that holism or holistic health is subject to individualistic interpretation

as it can mean many things to many disciplines such as the use of alternative therapies, traditional and spiritual healing methods or complementary medicines in order to achieve a state of health. For the purpose of this dissertation, we will derive a holistic definition of health as a balance of physical, psychological and social needs in the context of community, culture and ecology. In this instance, the research is heavily weighted on the ecological context with reference to community and cultural issues within the physical environment. Here, it is important to develop an understanding of the determinants of health in order to explore this relationship.

1.3.4. Determinants of Health

Traditionally, health has been conceived as the absence of disease and this understanding has developed over time and assembles a variety of realisations, theories and scientific discoveries. Some of the earliest understandings of illness were centred on beliefs in witchcraft, demons, adverse astral influence and of the will of Gods (Wikipedia, 2010) and are still practised today in certain forms such as faith healing. These beliefs have been superseded by ideas such as the Miasmatic Theory of Disease which held that diseases such as cholera or the plague were caused by a Miasma or 'noxious air' filled with particles of decomposed matter and was identified by a foul smell. This theory was supplanted by the Germ Theory of Disease (Pathogenic Theory) proposed by Koch on the late 19th century which suggested that microorganisms are the cause of many diseases and has now become the cornerstone of modern medicine and clinical microbiology (Wikipedia, 2010). This theory is regarded as the first ecological model in which the interactions between a single infectious agent and its host are modified by environmental conditions (Forget & Lebel, 2001) and provides a platform for the Ecosystem Model for human health. This approach, coupled with the realisation of the limitations of a purely medical approach to health in the 1970's, led to an acknowledgement of the crucial role of the physical and social environment in sustaining good urban health and endorsed the role of the city.

1.3.5. Social Ecological Theory

Social ecology is viewed as an overarching framework, or a set of theoretical principles for understanding the interrelations among diverse personal and environmental factors in human health and illness (Stokols, 1996). Earlier models for human ecology were heavily focussed on the biological processes and the geographic environment although social ecological theory focuses on the social, institutional and cultural contexts in order to understand the nature of people's transactions with their physical and socio-cultural surroundings. This perspective encompasses a number of core assumptions about the dynamics of human health in the promotion of personal and collective well-being (Stokols, 1992). The first assumption outlines that the physical environment (geography, architecture and technology) and social environment (culture, economics and politics) influences the healthfulness of a situation and the well-being of its participants. Secondly, human environments can be analysed by their physical and social components as well as their objective (actual) or subjective (perceived) qualities and can be described as an array of individual attributes such as lighting, temperature, noise, space arrangement and the relationships between these features.

A number of models for human ecosystems have been developed for understanding the determinants of health and how it may be affected and the Mandala of Health (Hancock, 1985) incorporates this social-ecological dimension.

1.3.6. The Mandala of Health (Hancock, 1985)

The term 'Mandala' has been adapted from the Buddhist word for intricate circular design and is regarded as a circular symbol of the universe of health and is centred on the human being and states that an individual's health is a function of the body/mind and spirit integration and well-being (Hancock, 1985). Here, the individual exists within a family structure which is regarded as our most immediate social environment.

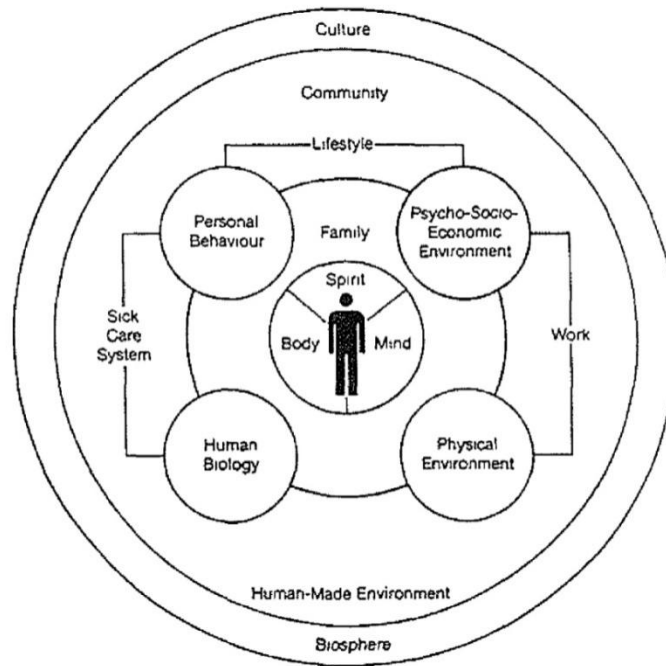


Figure 10: The Mandala of Health Conceptual Model

The family is a great mediating structure within our society and is responsible for establishing our values, attitudes and behaviours and forms a mechanism for support and protection. The individual and the family are affected by four key factors; personal behaviour, psycho-socio-economic environment, physical environment and human biology (see fig.10). These factors are attributed to health in the following ways:

Personal Behaviour (Risk Behaviour)

- Eating habits, exercise, stress management
- Wearing seatbelts and crash helmets, use of health services
- Smoking, drug and alcohol abuse

Psycho-Socio-Economic Environment

- Peer pressure from work, school, media and advertising
- Influence of social status such as class, income, knowledge, skills
- Resources and opportunities to lead healthy lives

Physical Environment

- Internal environments such as school, work and home
- Thus affected by the design of our buildings, air and light quality, hazards

Human Biology

- Genetic transmittal of mutations, inborn errors of metabolism
- Competence of immune system, aging

The sick-care system or health care system is concerned primarily with sickness and disease rather than health and provides the vital role of managing and rehabilitating or treating of the health issues associated with human biology and adverse personal behaviour. Work is a particularly important function within our lives especially in our westernised, industrialised culture. A workplace can be health hazardous and the mental and social environment can contribute to stress, alienation, boredom and frustration. Furthermore, it is an important part of social identity and social networking and is key to giving meaning and purpose to our lives. Lifestyle is a consequence of the interaction between personal behaviour and psycho-socio-economic environment within the context of community and culture. All of these factors operate within the context of the community and human-made environment. Important community services are offered at the community level and include:

- Health, education, social services, policing, recreation and public areas
- Organisations, groups and networks: self-help networks, churches, neighbourhood associations, clubs, unions, schools which provide for 'social capital'

The man-made environment encompasses the built environment and the human-modified environment. These include:

- Built Environment: neighbourhoods, urban settlements, districts
- Man-modified Environment: agriculture, energy, transportation networks

The overarching context of life includes our biosphere and culture (see fig.10). Culture refers to the norms and values which underlie our thoughts and beliefs about health and health determinants. This includes societal feelings towards the natural steps which should be taken to improve health or to treat illness.

The biosphere is then the ultimate determinant of health and is a term used to describe the part of the planet which contains plant and animal life. This domain provides us with life-support systems and a range of eco-services and acknowledges that humans are a part of nature and not dominant over nature.

1.4. Research Methodology

An exploration of urban architecture as a facilitator for health is steered by a research methodology that encompasses the two significant components; primary and secondary research.

The primary research includes the collation of primary data gathered through interviews and case studies while the secondary research is generated through the literature review, precedent studies and conclusions. The preliminary literature study was compiled by librarian staff at the Barrie Biermann Architectural Library (UKZN) and uncovered the fundamental body of information required to initiate the process of the literature review.

1.4.1. Study Area and Range

The research project will initially be polarised by the two primary discussions on urban environments and health. These topics will look at international and local examples which exhibit a response to the effects of urbanisation and the promotion of health sustaining practises through an articulation of the built environment and will arrive at South African examples focussing on these issues. Secondly, the research will explore the realm of health and well-being through an investigation into the dynamics of health and the theory of human ecology.

1.4.2. Primary Research (Empirical Study)

Firstly, qualitative data will be gathered through the collection and collation of drawings, photographs, sketches and observations and will be analysed and discussed in the research background, theoretical review and case studies. Further data is collected through interviews and discussions with individuals who are knowledgeable about the issues and relationship between healthcare, health and wellbeing, architecture and urban design.

1.4.2.1. Interviews

Interviewees include:

- Renée du Toit (Health Facility Planner)
- Rael Harrowitz (Health Planner, ex. Johannesburg Development Association)
- Dr. Ayo Olowoagba (Head of Communicable Diseases, eThekweni Health Department)
- Robert Johnson (Healthcare Architect, Robert Johnson Architects)
- John Royal (Healthcare Architect, John Royal Architects)
- Paul Spooner (Engineer, Board Member of City Life)
- Elizabeth Spooner (Doctor, Board Member of City Life)
- Nigel Tarbotton (Metropole Architects)

1.4.2.2. Case Studies

Case studies are the second element of primary research and include urban precincts which will be visited, assessed and critically evaluated as environments which effectively operate as healthy urban precincts. These include:

- Hillbrow Health Precinct, Hillbrow, Johannesburg, RSA
 - o Lefelo la Thlokomelo Wellness Centre, Hillbrow, Johannesburg, RSA
- Bulwer Wellness Centre, Glenwood, Durban, RSA

The case studies have been selected based on their theoretical underpinnings as determined by the literature review, theoretical framework and precedent studies.

1.4.3. Secondary Research

Secondary research is achieved through the two subparts.

1.4.3.1. Literature Review (Non-empirical Study)

A comprehensive literature review will allow for the identification and assessment of information that is uncovered during the research process.

This information will comprise journals, magazines, published works and unpublished theses and dissertations and the process will be informed by UKZN staff, interviewees and self-study investigation.

1.4.3.2. Precedent Studies

The second subpart involves the study of relevant precedent. The information is gathered from journals, other published works, internet sources and interviews. The precedent examples will be included in the literature review and theoretical framework and explore the fundamental issues as they are identified, these include:

- Urban Design
 - o Kelvin Grove Urban Village, Melbourne, Australia
- Housing
 - o 60 Richmond East Housing Co-operative, Toronto, Canada

1.4.4. Alternative Data Collection Methods

A number of alternative methods for collecting data are utilised as an aside to the formal techniques. These include private observations of the buildings and health precincts that are visited. Particular attention is focussed on the perceived wellness, state of health and energy of the local community. Questionnaires form part of the primary data collection methods and are utilised to formally engage with the community in determining their perceptions and thoughts about the local community and environment. Finally, informal discussions are utilised as a passive mechanism for communicating further thoughts and experiences surrounding this discussion. A synthesis of the primary and secondary research will attempt to substantiate the hypothesis as it attempts to explore the realm of architectural influences on healthy cities.

Chapter 2: Literature Review

2.1. Urbanisation and Urban Health Issues

This chapter is initiated by a chronological investigation of urbanisation in which the salient developments and issues linked to cities and urban health.

2.1.1. The Inception of Urbanisation

The first urbanised landscapes existed in the confines of valleys and flood plains such as the Nile, the Fertile Crescent and the Indus (Mumford, 1956) and were limited by the productivity of the agricultural land available. The introduction of large scale river and sea transport and the introduction of roads for chariots, horses and carts enabled these self-contained, polarised communities to trade which permitted the export of surplus production. Cities maintained the environmental balance and specialised in agriculture, promoting the development of trade and industry which enabled cities to expand in population. This growth effectively drained away the resources and manpower from the countryside without the return of any equivalent goods and cities expanded beyond the limits of the agricultural hinterland. This is the first stage in which the natural environment had been compromised due to the demands of production and the destructive use of natural resources for industrial purposes such as mining and smelting (Mumford, 1956).

At this stage, the technologies of modern medicine and disease prevention were not fully understood and typical remedies for illness were centred on unscientific methods for diagnosis such as divination, therapy through prayer, lay medicine and Uroscopy (Berger, 1999). A link between health and habitat had not credibly been explored and typical diseases were a result of malnutrition, a lack of hygiene and unhealthy sanitation practises.

2.1.2. Industrialisation

The acceleration of land cultivation and improvement for human use in the 19th century effectively marked the full expansion, performance and influence of the process of urbanisation which saw a significant shift in the balance between the natural and built environment. Developments in technology and

industrial processes marked the beginning of Industrialisation in the mid 17th century (Mumford, 1956) which saw a transformation from the age of utilities to the age of the machine. This converted a predominantly agricultural/rural society to an industrial one and marked a significant spike in the growth of the population. Urban sites now moved from valleys and flood plains to ones which had access to natural resources such as coal, limestone and iron-ore beds and developments in locomotive transport led to new levels of accessibility and growth. A new rate of automated and unregulated growth had allowed cities to take on a new form.

The conurbation of cities (Geddes, 1915) saw urban areas, which were distinct as political units and topographical features, expand to form dense population masses on a scale greater than before. The increase in size was void of any individual form or quantitative limits and represented an impoverished, institutional life with little social nucleation. This prompted the necessity for architects and urban planners to regulate and study the intensifying urban landscape as the concentration of industry had marked effects on the environment and the health of the urban population. Industry expelled noxious compounds into the atmosphere creating smog and noise pollution. The severe overcrowding, crime and filth prevailed as tenements and factories crept into the urban fabric and polluted the natural water systems killing natural vegetation, contaminating potable water and adding to the problems of sanitation. The quest for light, air, space and hygiene became a natural penalty of over-concentration.

2.1.3. Transportation Growth

Railroad transportation developed and a new demand for flat, low lying land adjacent to and running through the city replaced the flat, fertile sea-level sites used for agriculture and recreation and formed a division within the countryside and urban areas. The invention of the automobile added to the mass transportation network which performed as another divisionary component further sterilising the landscape and disrupting habitats. Furthermore, the pollution from automobiles added to the health burden of

urban dwellers through injuries and deaths sustained from road accidents and the pollution causing respiratory complications.

The Industrial City drew population into the cities for promises of better economic opportunities, access to education and healthcare and increased amenities. The reality is that cities became overcrowded promoting slum living and poverty which offered poor drainage and sewage waste facilities, polluted water and a general lack of hygiene. Outbreaks of Typhoid, Cholera and Tuberculosis occurred at regular intervals and were later combated by the discovery of water as a carrier for bacteria and disease in the mid 19th century (Snow, 1854). The Industrial City caused many social, political and economic ills as an environment marred by poor nutrition, dangerous machinery, impersonal work and isolation, homelessness and substance abuse (alcohol).

Advancements dedicated to favourable living conditions promoted pollution free, low density, space abundant living which preserved the natural landscape and offered private gardens for subsistence agriculture. Ruskin, Morris, Cadbury and Lever conceived ideas for a Model Village around factories and industry which included semi-detached, terraced houses with gardens for planting and access to light, air and space as a counteraction to the urban slum living.

Florence Nightingale developed the Environmental Theory which was essentially the act of manipulating the environment of a patient to assist in recovery (Wikipedia, 2010). This theory promoted access to fresh and pure air (through natural ventilation), fresh food and water (diet), efficient drainage, cleanliness (sterilization), access to direct sunlight, views and a quiet, noise free and warm environment (see fig.11). Although revolutionary to health care practices at the time, this practice was supported by advancements in medical discovery such as Pathogenic and Germ Theory (mentioned earlier) as a number of Urban Movements developed.

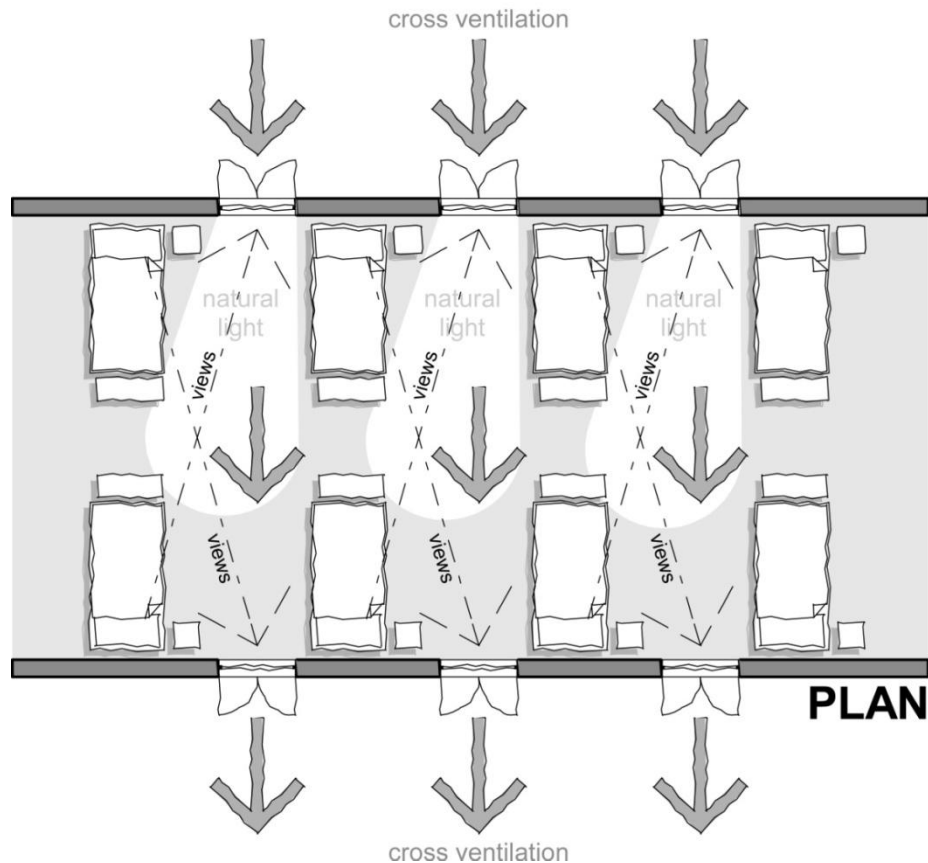


Figure 11: Plan showing a typical hospital ward with cross-ventilation, natural light and views

2.1.4. Suburban Movements (18th and 19th century)

These movements were a reaction against the overbuilding and overcrowding in cities and offered an escape from the congested and disordered urban environment to the luxury of fresh air, gardens, sunlight and open spaces in the open country. The low cost of the urban land and densities of 2-10 plots per acre offered a superior biological and social environment despite the sacrifice in man hours for travelling. This decentralisation of the inhabitants of the city was not accompanied by similar shifts in industry and served to sustain the antiquated pattern of concentration (Mumford, 1956).

Ebenezer Howard recognised the social, biological and psychological pressures that underlay this shift from cities to suburbia and proposed a marriage between town and country through the method of colonisation. The Garden City Movement (Howard, 1898) proposed self contained, balanced communities supported by local industry with a permanent population and density surrounded by land dedicated to agriculture, recreation and rural

accommodation (see fig.12). The in-situ green belt was immune to urban building and maintained the urban-rural balance by limiting growth and making the surrounding agricultural area an integral part of the cities form. This focus on neighbourhood design offered a generous proportion of open space to built form and facilitated interaction as people benefitted emotionally and physically from interpersonal relationships (Jackson, 2002). Neighbourhood space increases familiarity between members of the community and promotes mutual aid, empathy and social capital. Despite certain social benefits of the Garden City Movement, the process propagated de-urbanisation and decentralisation of communities into green garden-factory towns and promoted the degradation of the city core.

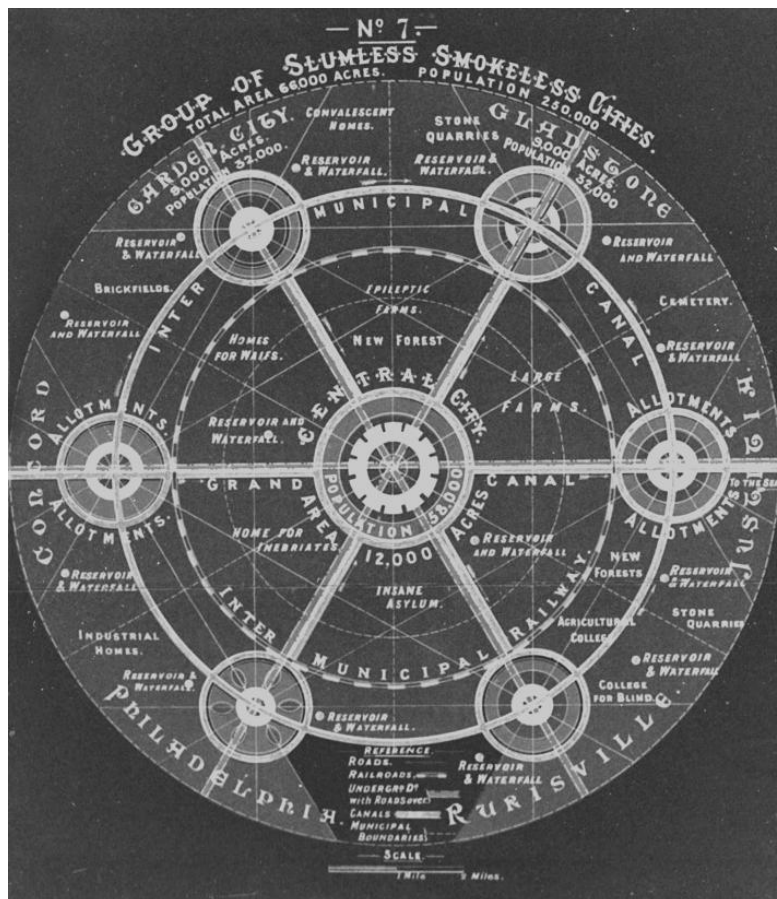


Figure 12: Model for the Garden Cities Movement (E. Howard 1898)

2.1.5. Sprawling Cities

Sprawl is the effect of continued development of low density suburbs and metropolitan areas along transportation routes and over vast tracks of natural

land (see fig.13). This phenomenon was fueled by further advances in transportation (automobile) as communities typically worked in the cities and lived in the suburbs promoting a vehicular dominated society and contributing negatively to commuting times. Sprawl is facilitated by a complex pattern of land-use, transportation, social and economic development promoting stratification. This enforced the design of neighbourhoods based on wealth and essentially promoted economic, racial and ethnic segregation as similarly prosperous families resided within similar neighbourhoods. This homogenous and incremental development (see fig.13) is void of the character and diversity of traditional urban places (Frumkin, 2001) and replaced large areas of natural surfaces with impervious, contaminated ones affecting the rate of ground water absorption and depositing pollutants.

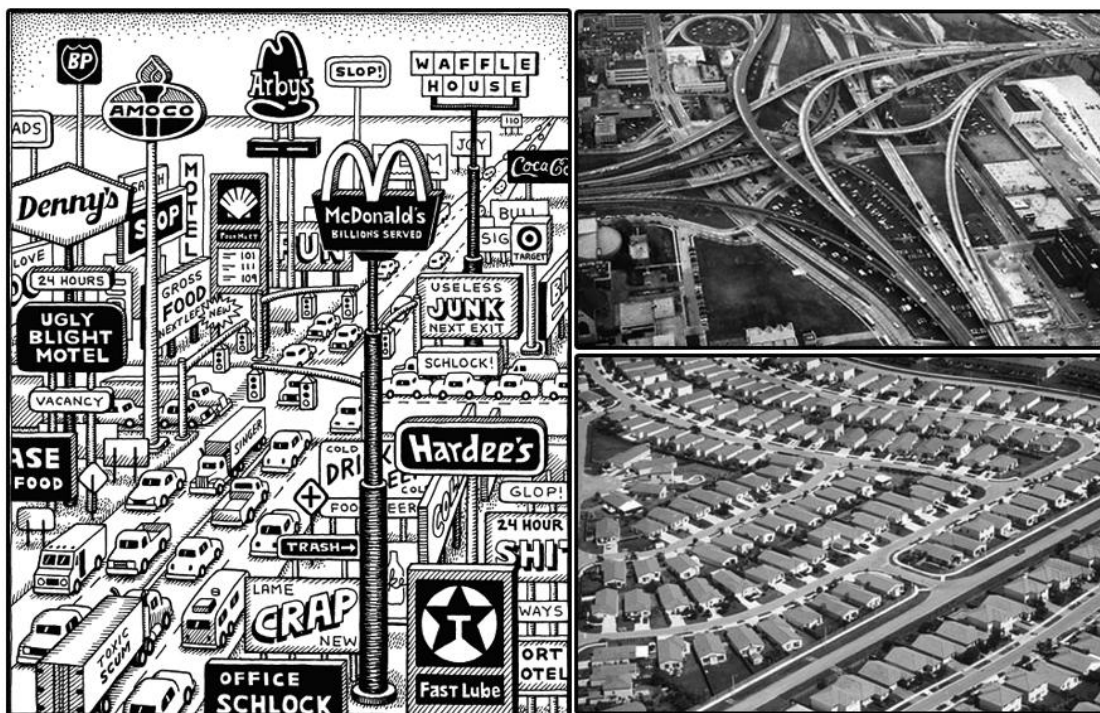


Figure 13: Attributes of Urban Sprawl (mass road networks, incremental housing and traffic congestion)

The segregation of land-use policy and Euclidian zoning separated housing, retail, offices, industry, recreational facilities and public spaces. Single-use zoning laws promoted a low density, 'leapfrog' pattern and an inefficient use of natural land which necessitated the use of automobiles for commuting between these zones. This low connectivity looked towards infrastructure and

road networks for accessibility and replaced the need for paths, lanes and pavements which emphasized driving over walking and cycling. The inherent effect is a low level of physical activity promoting sedentary lifestyles. A sedentary lifestyle is one of low physical activity and looks at the relationship between active living and health. Low physical fitness is associated with a 'higher risk of cardiovascular disease, hypertension, high cholesterol, diabetes and obesity' (Frumkin, 2001:11).

Automobile reliance is a penalty to the mental and social health benefits of low density suburbs which offer relief from the turmoil of urban living and the capacity to restore mental health through the access to nature and peaceful refuge. Automobiles compromise physical health through the dangers of commuting (accidents) and pollution which increases the incidence of respiratory problems, asthma and cardiopulmonary disease. Automobiles offer extraordinary levels of personal mobility although hinder opportunities for interaction and community engagement and is linked to psychological stress (Kluger, Koslowsky and Reich, 1995).

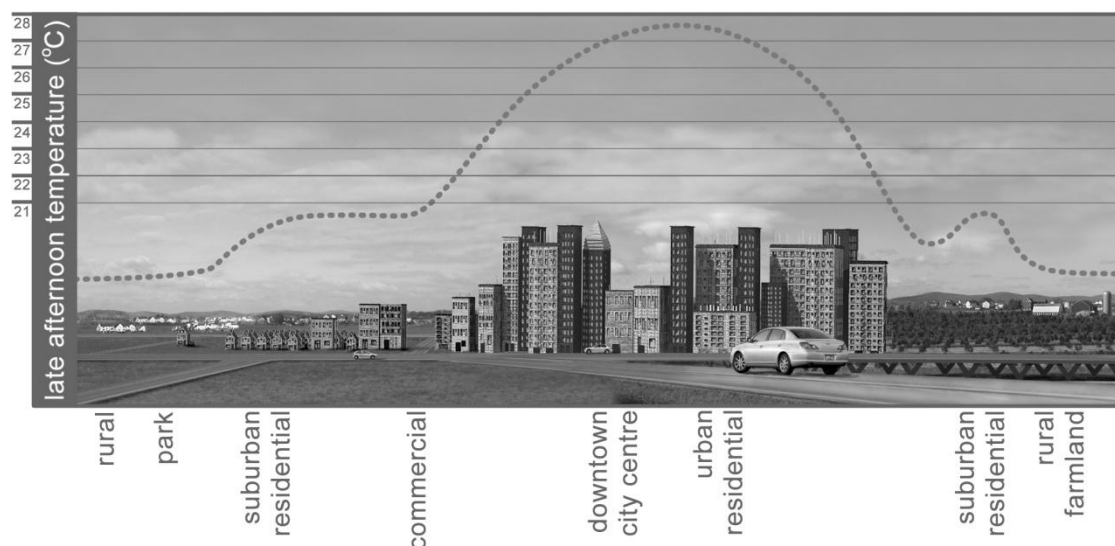


Figure 14: Perspective showing Heat Island Effect

Sprawling metropolitans replace natural land with hard, dark, heat absorbing surfaces such as roadways, rooftops and parking lots which radiate the heat as infra-red thermal radiation (Frumkin, 2001). These surfaces reach higher temperatures than soft, green surfaces which are cooled by shade and water

evaporation. The result is that surfaces reach higher temperatures than the surrounding air and sprawl effectively increases the area and intensity and promotes a spike in the ambient temperature of the city centre (see fig.14). This 'Heat Island Effect' is a significant health hazard and promotes heat stroke, exhaustion, and hyperventilation and contributes significantly to the energy costs of buildings utilising mechanical light and ventilation to maintain thermal comfort levels.

2.1.6. The Emergence of the Metropolis

The high-rise city Metropolis was preceded by the Industrial city and evolved with the development of technology such as steel construction techniques and the invention of the elevator at the beginning of the 20th century. Traditionally, the city centre housed large office buildings, industrial factories and warehouses although the efficient forms of transport penetrated the city through rapid transit lines of rail and highways and provided cheaper transport for the majority of the population. The central business districts underwent radical transformation with the emergence of the skyscraper which offered the maximum economic value for the minimum parcel of land. The high-rise city centre replaced the industrial zones of the traditional industrial city centres which shifted to the peripheries and led to the migration of the urban middle class (labour communities) to the rural or peri-urban areas. The Metropolis had developed into a nearly impenetrable urban forest void of human scale and accessible mainly through urban freeways and rail transit that dominated the cities form and shape. This intense scale ordered by a web of pedestrian voided motorways provided significant environmental issues such as noise and air pollution and a lack of access to natural light and ventilation. Many challenges arose out of the necessity for adequate inner city housing which led to issues of overcrowding, a lack of hygiene and sanitation, deterioration of services, high crime rates and a realm of squalid living conditions. This prompted a number of 'Modern City' planning models and Utopian visions which investigated the issues of high densities, housing, accessibility and land use patterns in the attempt to provide a city environment which acknowledged physical and social wellbeing of the urban population.

A number of models explored the relationship between the high-rise tower, the proliferation of the transport network and green open spaces. Le Corbusier's "Contemporary City for Three Million, 1922" and "Radiant City, 1935" advocated a solution to the densities of the urban metropolis by placing high-rise apartment and office towers on park-like settings, accessed by a sophisticated system of superhighways and rail transit. These visions were abstract and lacked a 'real world' context.

Plan Voisin (Le Corbusier, 1925) was an attempt to apply these principles to the Right Bank, Seine in France. This plan replaced the horizontal congestion of the 'old city' with vertical high-rises set into landscapes of parks, trees and organically drawn pedestrian footpaths. A multi-level transport interchange would service all modes of transport (trunk, commuter, subway and air) and would converge at the centre between the business and the residential districts (see fig.15).

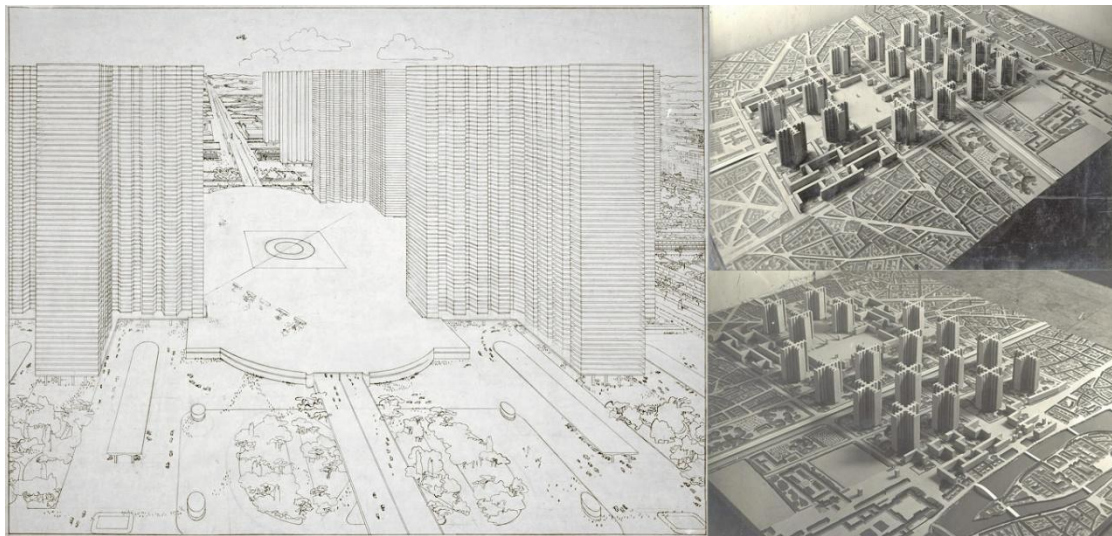


Figure 15: Perspective and aerial view of Plan Voisin (Le Corbusier, 1925) showing urban and spatial form

The glass, crystal cruciform towers of the business district achieved sufficient densities within a sparse urban fabric and accommodated landscaping, roof gardens and extramural facilities. This typology promoted access to natural light and ventilation, supported the social needs of the working population and attempted to offset pollution by maintaining a balance with the natural environment. Triple-tiered pedestrian malls with stepped terraces interspersed

between these towers were designated for entertainment and culture accommodating cafes, shopping, clubs and garden terraces. The project proposed a comprehensive demolition of much of the existing city although selected buildings were identified as cultural treasures and would be stripped of their ancient urban fabric and preserved as monuments. These buildings would exist amiss between the skyscrapers and low-rise terraced buildings as preservations of the past and offered a 'skewed' sense of heritage in the evolution and continuity of the city.

The housing program separated the elite and the working class; the elite lived in two-storey, luxury 'immeuble-villas' in close proximity to business, shopping and cultural facilities while the workers would reside outside the city centre. The scale of the housing solution mirrored some of the physical and mental health benefits of the Garden City Movement although the disconnection promoted the social and economic stratification of typical sprawling cities and diminished social capital.

2.1.7. Inner City Housing and Health

The quality of inner city housing is a significant contributor to sustaining health. Housing 'fulfills people's need for a 'place' which provides refuge from psychological stressors, where people can rest, eat, work, study and socialize.' Furthermore, 'it is the realm where economic, environmental and social factors that affect health converge' (Athens, 2004:4). Shelters are used for regenerative activities such as sleep, digestion and rest and provide relief from the urban environment stressors such as climate, toxins, disease and noise. A link exists between the quality of housing and good health. A high quality protects residents from communicable and chronic diseases, injuries and accidents, promotes healthy social interaction with family and the community and limits psychological stress. Conversely, a poor quality of housing exposes residents to continuous health threats and is linked to stress, anxiety, the deterioration of social networks and psychosocial risks.

There are number of physical and social components of urban housing that contribute to health. Physical components include the structural competencies

which allow a freedom from health risks, safety and accidents, especially fire. Damp is a major source for disease transfer and prompts chronic respiratory problems such as asthma. Housing should provide access to natural light, ventilation and services such as heating, electricity, sanitary sewage, waste disposal, communications, and a pure water supply. Internal furnishings should encourage adaptability and change and provide individuals and families with the opportunity to manipulate their own environment and private space. This lack of control over personal space and the home environment is linked to psychosocial stress and hypertension.

Natural determinants include geographic location, access to amenities (shopping, recreation, health services) and the affordability of housing and services and goods within the neighbourhood. The surrounding environment should provide adequate space for community activities such as parks, playgrounds and community spaces promoting interaction, peaceful refuge and rehabilitation. Access to employment opportunities and security are a collective efficacy and a social contributor to health. Trust, social cohesion and informal social control (Higgins and Krieger, 2002) are social qualities which positively affect levels of stress and promote social capital.

A number of social and physical ills are attributed to insufficient urban housing. Insecure tenure, overcrowding, low amenity value and inadequate service provision promote the degradation of the home and neighbourhood and prompt issues of security and safety. Accidents, injuries and poisoning are the physical consequence to low housing standards and collectively incur the psychological penalty through stress, depression, hopelessness and a loss of moral values prompting substance abuse in the form of alcohol, smoking or drugs. Urban slums are the ultimate penalty of these unhealthy housing characteristics and are the spatial manifestations of urban poverty and social exclusion.

The degradation of inner city housing and the physical deterioration of the community environment are explicitly linked to crime. The 'broken window' theory (Kelling & Wilson cited by Kim et al, 1999) suggests that

neighbourhoods which display signs of neglect and decay are evidence of the vulnerability experienced by the community who have begun to withdraw from community involvement and upkeep. This phenomenon supports the incidence of crime, compromises community safety and promotes the barricaded 'defensive architecture' of gated communities and enclosed neighbourhoods. These neighbourhoods provide clear spatial and social distinctions contributing to segregation and social indifferences and the 'withdrawal of individuals from the public realms which exist within these neighbourhoods' (Landman, 2007:14). A lack of social cohesion, stress, diminished community safety and awareness are mental and psychological health issues which arise from crime and urban blight.

2.2. Precedent Study: 60 Richmond East Housing Co-operative

The following project is a purpose built commission within the hospitality industry and incorporates inner city housing, restaurant facilities and a training school. The example has been selected as it identifies a range of solutions and interventions which are applicable to inner city health.

Housing Project: 60 Richmond East Housing Co-operative

Architect: Teeple Architects

Context: Toronto, Canada

Construction: March 2010



Figure 16: Images showing scale, form and context; and ground floor training kitchen and restaurant

The Richmond East Housing project is an 11-storey co-operative housing scheme developed to accommodate hospitality workers within a medium to high-rise urban fabric in Toronto, Canada (see fig.16). The scheme addresses issues such as environmental sustainability and the social dynamics of inner city housing by incorporating additional facilities, social spaces and urban agriculture. Moreover, the project identifies a number of solutions to urban health challenges such as the access to:

- Natural light and ventilation
- Reliable and healthy food sources
- Private and communal (social) space
- Amenities and employment opportunities

The development seeks to express the notion that urban form can simultaneously be environmental form and imagines the city as an extension of the natural environment. The housing scheme looks at the social dynamics of urban housing through the idea of architecture as a form of urban permaculture and the use of social spaces for food production and recycling as well as access to natural light and ventilation. The project seeks to provide a sustainable model for inner city housing through architecture as a medium to cultivate greenery, cool and cleanse air and absorb and re-use water.

Urban Permaculture and Health

Permaculture is the creation of self-sustaining human habitats and reduces society's reliance on industrial systems of production and distribution (Ostry et al, 2007) Gardens are carved out of the building at various levels to create principle social spaces within the building and are utilised for the propagation of fresh fruit and vegetables which it provides to the ground floor restaurant and training kitchen (see fig.17). The cycle is completed by recycling the waste from the kitchens as compost which can be reused to fertilise to the roof top and internal gardens. The roof top garden incorporates a cistern (see fig.18) which stores and recycles the excess water which is reused as irrigation for the green 'grow-wall' and other food gardens.

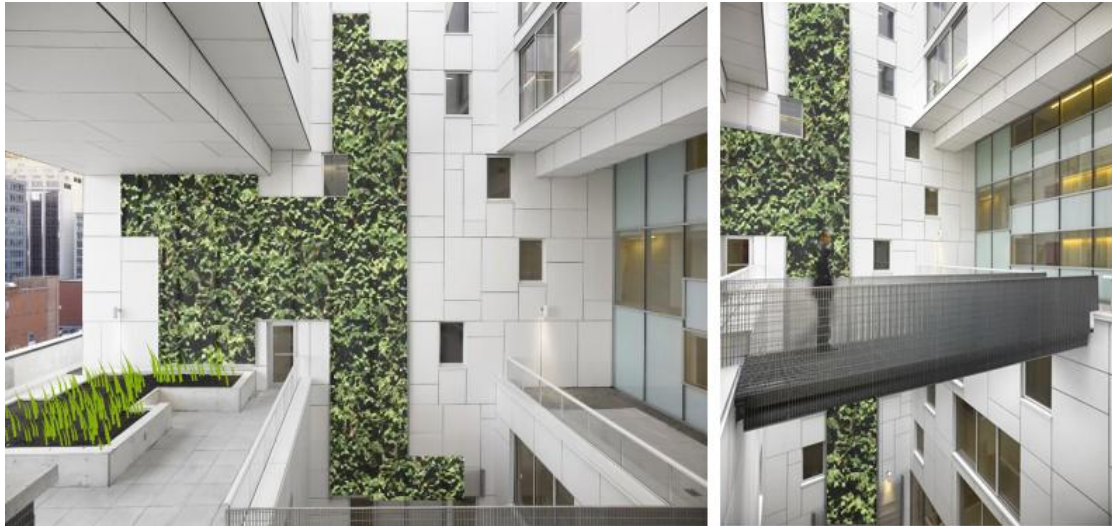


Figure 17: Images showing central void, internal garden as social spaces and the green 'grow-wall'

The concept of urban agriculture is particularly relevant to health. The incorporation of community gardens within a building provides a sustainable commodity in fresh fruit and vegetables and contributes to the nutritional needs of the community who service these gardens. Furthermore, nutritional education could be facilitated through the exercise of community gardening and could further stimulate interaction and provide cohesion as these gardens become principle social spaces within the building.

Environmental Benefits relating to Health

The building utilises a 60/40 glazed area to allow natural light to penetrate the internal spaces. This is further promoted by the internal gardens which create a deconstructed solid mass (building form) and provides further natural light and ventilation internally. Access to natural light and ventilation is a considerable challenge in dense urban areas. The accommodation is organised around a central void which, through the stack effect, promotes ventilation throughout the building's core and provides cooling through the evaporation of moisture from the internal gardens and grow-wall (see fig.18).

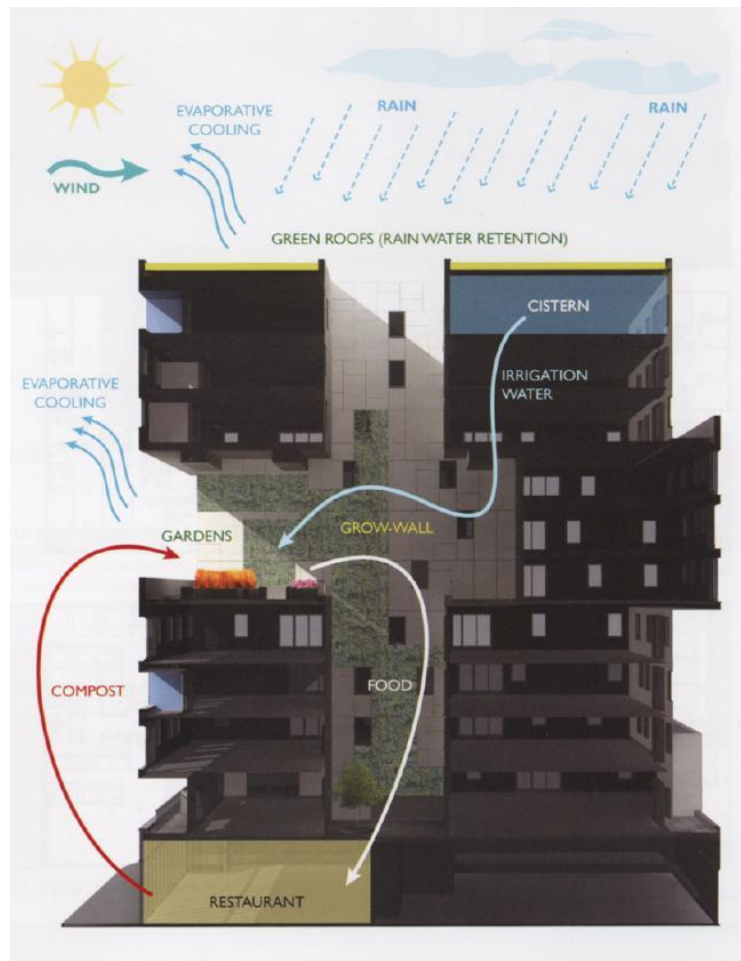


Figure 18: Section showing the cistern, internal 'grow wall' and natural ventilation through evaporation

The roof top garden ensures that the entire footprint of the building is covered by a soft, green, heat recycling surface (see fig.19) which provides insulation, decreases the ambient temperature of the building and is an inroad to lessening the Heat Island Effect. The envelope of the structure is further insulated by a 'rain-screen' cladding which eliminates thermal bridging and fibreglass glazing frames which act as extended thermal breaks. The internal cladding system is white and reflects light through the internal void ensuring an illuminated inner core and goes some way in reducing the incidence of damp; a significant contributor to respiratory complications and disease transfer.



Figure 19: Images showing the roof top garden and the deconstructed mass of the building

Accommodation, Space and Health

The ground floor accommodates the training kitchen and restaurant which serves to animate the street. These facilities have a completely glazed, ground floor road frontage and offer a direct visual connection between the users and the passing public (see fig.16). This serves as a clue and affirms the purpose and use of the building as a cooking and training facility as commuters experience the patrons and scholars in the restaurant and training kitchen. This creates a building which is legible and well defined within the built environment. Legibility and coherency contribute positively to levels of stress and hypertension as an individual is able to understand and interpret their environment through a sense of connectedness. Furthermore, legibility enables the user to create clear and accurate images of a place as a means of interpretation and understanding (Lynch, 1981). The internal gardens create a playful articulation of solid and void which present a series of overhangs and openings offering shade and a visual connection to the sky and the external environment. The building is therefore responsive to changes in climate and offers refuge through shade or warmth and sanctuary through an interaction with the natural environment. Here, the user can find refuge in the building and can adapt to the changes in the environment by the use of the variety of spaces provided.



Figure 20: Images showing the independently coloured private balconies

The floor layout and accommodation schedule offer an interplay between the private, semi-private and communal spaces. The private contained dwellings are relieved by semi-private and shared balcony spaces and promote an interaction between neighbours and surrounding tenants. Larger communal spaces and balconies are linked to circulation corridors and amenity spaces throughout the floors (see fig.21). These semi-private balconies are individually coloured and offer identity and individuality which positively affect social wellbeing through connectedness and security through the presence of others (see fig.20).

On the second floor, a large multi-functional amenity room (see fig.21) with kitchen and ablution facilities spills out onto the social garden spaces and is used for seminars, social gatherings and as a place for relaxation. Here, occupants of the building actively engage with one another which support community cohesion and social capital. Units are organised in a variety of sizes and layouts which ignore the typical incrementality and uniformity of unhealthy inner city housing typologies and embrace the heterogeneity of the families and individuals who reside in cities (see fig.22). Here, the hospitality workers have a facility which is mixed-use and provides accommodation, employment and education or training and negates the excessive use of transport for accessing further amenities.



Sixth Floor Plan

- residential corridor
- outdoor amenity space
- indoor amenity space

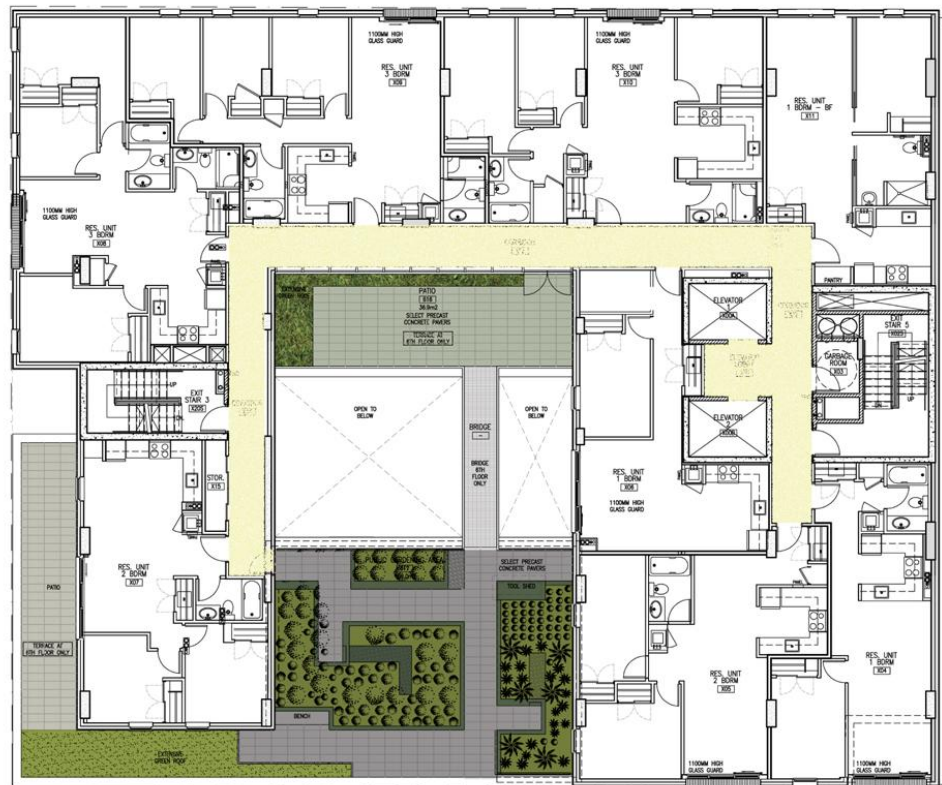


Figure 21: Plan showing the relationship between the amenity spaces, balcony and private dwellings

Conclusion

The Richmond East Housing Development provides a number of amenities which contribute positively to urban health. The beneficial qualities of natural light and ventilation are facilitated by the central void and community gardens which penetrate the solid mass and promote health through nutrition, community interaction and social space-making which is used for refuge and revitalisation. The multiple-use reduces the need to travel in search of amenities, services and employment and negates the excessive use of motorised transport which has numerous effects on mental and social wellbeing. Furthermore, this multi-storey development intensifies the urban core which reduces the incidence of sprawl and the associated health risks. The concepts of legibility and coherency are a common thread throughout the

building and are facilitated by the transparent ground floor which creates a strong visual connection with the road users and passersby.



Sixth Floor Plan

- residential corridor
- outdoor amenity space
- internal gardens

Figure 22: Plan showing the internal gardens, the central void and the various sizes and layouts of the units

2.3. Attributes of Urban Environments Affecting Health: An Overview

A contemporary city, then, is a morphology of extreme densities defined by a web of access corridors interspersed with fixed natural features that present urban environments with a number of physical, epidemiological and social characteristics affecting health. This overview is a synthesis of the information uncovered during the literature review and chronological investigation of the effects of urbanisation on health. A number of salient issues have emerged which will be explored in the precedents and case study.

2.3.1. Physical Environment

High densities and overconcentration of the urban fabric are key contributors to the challenges for urban health. Complex land-use patterns, transportation, social and economic development are linked to issues of accessibility, coherency and connection and effectively promote stratification as experienced in sprawling suburbs and complex urban centres. Separation of land-uses and amenities promote higher commuting times and motivates the necessity of an effective public transport system. Excessive commuting replaces the opportunity for family interaction, personal regenerative activities and rest and is linked to hypertension, stress and psychosocial disorders.

Urban city infrastructure and buildings have replaced much of the natural environment with hard, heat absorbing, impervious surfaces which contaminate water stocks and advance environmental ills such as the Heat Island Effect promoting heat exhaustion and hyperventilation. Furthermore, a lack of green open space compromises the opportunity for peaceful refuge, regeneration, interaction and physical activity which has a profound effect on mental, social and physical health. Public facilities such as squares, pedestrianised streets, walkways, cafes and sports facilities promote physical and social activity as partial compensation for green open space and reduce the incidence of sedentary lifestyles.

Cities are population intensive and inherently overcrowded. The challenges of access to natural light, ventilation and open space is linked to health problems associated with respiratory complications, cardiovascular disease and low energy levels. A lack of personal controllable space is attributed to issues of security and privacy promoting physical and psychosocial stress.

Intensification is an added demand for service provision and local amenities such as water, sanitation, sewage disposal, heating and health care services. Poor sanitation and hygiene is linked to infectious disease transmission and outbreaks. A failure to provide basic services, amenities and housing promote urban slums which are largely linked to socioeconomic circumstance and are vehicles for segregation and stratification. Poor urban housing and slum neighbourhoods are sources for crime, low economic opportunity and

substance addiction which diminish community health, security and social cohesion.

Air and water pollution contaminate water, waste and fresh air and are linked to infectious and chronic disease risks in the form of cardiovascular and respiratory health complications, hypertension, stress. The reliance on mechanised forms of transport and automobiles in particular are a primary source for health inequalities in urban centres. Traffic congestion increases the incidence of road and pedestrian accidents and is a significant source of air and noise pollution linked to mental health problems, sleep deprivation and tension. Automobiles offer increased mobility, are life enriching and widens experience although offers a peculiar kind of privacy and a panoply of sensual pleasures (Barr, 1970). Private commuting is an exercise void of the opportunities for casual interaction and social engagement. An effective and efficient public transport system, pedestrianism and cycling as an alternative source of mobility are a sustainable alternative to automobile reliance and provide an environment suitable to such engagement and interaction.

2.3.2. Epidemiological Environment

Accidents, injuries and poisoning are the direct health effects of cities and compromise the immediate physical condition and health status of an individual. Historically, urban populations experienced a higher risk to communicable disease than rural communities due to the penalties of overconcentration and an inferior understanding of medicine and science. Currently, the advances of medicine, technology and science which dictate the efficiency of the health care practices, disease prevention and curative procedures has reduced the risk of disease epidemics and chronic ailments. Despite this, the incidence of communicable disease remains high in urban areas due to a lack of hygiene, sanitation, quality of housing and social circumstances. As a result, HIV infection and Tuberculosis are chronic diseases prevalent in cities although sufficient access to health care services and the availability of preventative, promotive and curative care reduces the rate of mortality and morbidity (World Health Organisation, 2010).

A significant number of non-communicable diseases are attributed to the rigours and stressors of urban life. Respiratory and cardiovascular diseases, diabetes, cancers and obesity are accumulatively affected by air and water pollution, a lack of natural ventilation and low levels of physical activity. Furthermore, the age of convenience leads to undernourishment and the lack of healthy food intake. Mental health issues such as hypertension, psychosocial stress, depression and anxiety disorders are facilitated by social factors, noise pollution, a lack of interaction and anonymity.

2.3.3. Social Environment

A fundamental social consequence to urban living is diminishing social capital and social cohesion. Social capital can be defined as the degree of citizen involvement in a community and the degree to which people know and trust their neighbours and the numerous social interactions and transactions between them (Frank, Kavage and Litman, 2005). Putman (2000) writes that social capital can be upheld through mechanisms such as community engagement, volunteerism, informal sociability and social trust and these measures are related to numerous aspects of human health and welfare (Putman cited by Jackson, 2002:193). A number of habits which are adverse to health such as physical inactivity, obesity, smoking and alcoholism are associated with weak social ties. Cities provide limited opportunities for spontaneous interaction, community engagement and informal sociability. These issues are linked to a number of social urban features which do little to facilitate social investment and include:

- Time spent commuting and working
- Lack of public space
- Lack of pedestrianisation and alternatives for mobility
- Segregation (economic, ethnic, racial) through land-use policy
- Crime, low employment opportunities

Crime is linked to the decline of inner city areas and is a symptom of a diminishing social fabric which contributes negatively to social wellbeing. The fear of crime can lead to a sense of helplessness and distrust of others within

the local and surrounding communities. The inherent effect is a social form of withdrawal and is associated with poor self-related health, higher blood pressure and increased anxiety (Jochelson, 2004 cited by Dodson, Ellway and Mead, 2006).

Chapter 3: Theoretical Framework

3.1. Conceptual Framework: Health and the Built Environment

The following model is an adaptation of a conceptual model developed to delineate the mechanisms and pathways through which cities affect the health and wellbeing of urban populations (Northridge and Schulz cited by Biswas, Northridge and Sclar, 2003:559). This new model identifies the fundamental factors at the macro and community levels which are inherently related to a range of health outcomes at the individual and interpersonal level (see fig.23). The fundamental level includes components of the built environment such as land-use, zoning, services etc. and devices within the social context such as community investment and civic participation. The health outcomes are categorised as physical, mental and social/psychological and the relationship between these two tables have been identified and explored through the chronological analysis of urbanisation in the Literature Review.



Figure 23: Conceptual model of the fundamental factors for health outcomes

3.2. Defining a Healthy City

A healthy city should therefore be one which addresses these issues identified in the Literature Review. The components of the physical and natural environment within a healthy city should be organised and orientated to alleviate the health burden to the social, mental and epidemiological environment. Moreover, the health of a city is more than simply the health of its population and the accumulation of qualitative information to confirm this (World Health Organisation, 1988). The World Health Organization looks at the definition of a healthy city as one that focuses on the processes which create the possibility of health for its community. That is, 'one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support one another in performing all the functions of life and in developing to their maximum potential' (World Health Organisation, 1988:24).

3.2.1. Good City Form (Kevin Lynch, 1981)

Lynch approaches the notion of a healthy city as a place which is performance related and not a vision of an 'ideal city' or a Utopian ideal. He identifies a performance dimension within a city which is tangible and connected to important, health sustaining values.

"The fundamental good is the continuous development of the individual or the small group and their culture... a city is good which enhances the continuity of a culture and the survival of its people, increases the sense of connection in time and space, and permits or spurs individual growth." (Lynch, 1981:116)

Lynch proposes five significant performance dimensions that collectively make up a 'good city': vitality, sense, fit, access and control. 'Vitality' suggests that a settlement should support the vital functions and biological requirements of human beings and should facilitate all of those elements which allow us to survive as individuals as a continued species. Three principles are identified which relate to health and wellbeing:

- Sustenance: adequate supply of food, water, energy and air and a proper disposal of wastes
- Safety: a physically secure environment void of hazards and poisons where disease is controlled or absent and the fear of encountering them is low
- Consonance: the spatial environment should be consonant with the basic biological structure of humans which supports the natural rhythms of sleeping and waking, provides optimum sensory input, promotes exercise and controls the harmful effects of light, noise and indoor air pollution.

'Sense' is the degree to which the city can be perceived and organised in the minds of the community in order for it to be clearly perceived and put into a context of time and space. 'Fit' refers to the way in which the physical environment matches the way we act and how the spatial pattern matches the customary behaviour of its inhabitants. An example would be the provision of adequate inner city housing whereby the physical environment would need to accommodate the spatial, organisational and social requirements of urban communities in a way in which they are accustomed to living. 'Access' is the extent to which communities are able to reach one another and access a variety of resources, activities, services and information. The level of access is a determinant of the justice of a city. The root of this justice is determined by the level of 'control' a community has over their own environment and how responsible and well informed they are in that control. That is, the extent to which those who use, work or reside in a space control the use of access to that space.

In essence, Lynch proposes an urban environment which is safe (risk free), clean (hygienic) and makes provision for basic biological functions and human needs. A city should allow the occupants to fulfil those basic daily activities (sleep, eat, rest, exercise, movement, socialising, creativity) in an environment which is not harmful or restrictive. Cities should provide an ecological sustainability promoting a sense of permanence and ensure that services and

amenities are available and accessible by a community which is mobile and in control of their environment.

3.2.2. The Science of Ekistics (Doxiadis, 1977)

A number of these issues have been identified through the Science of Ekistics (Doxiadis, 1977) which looks at achieving a harmony between the inhabitants of a settlement and their physical and socio-cultural environments. Doxiadis suggests that there are five human needs that a city must satisfy in order for citizens to remain safe, content and aided in human development.

A city should maximise the potential contacts with other people and resources and minimise the effort in making these contacts based on a measurement of energy, time and cost. Cities should optimise protective space and attempt to bring communities and objects closer together without feeling crowded or threatened. Furthermore, the relationship between the community and other elements of the system (nature, society, buildings and communication networks) should be optimised. A balance between these principles creates an urban environment which promotes a freedom to move efficiently within a city and maximises the potential for contacts and interaction. Urban issues such as diminishing social capital and community cohesion are addressed through freedom of mobility and accessibility which facilitates social interaction. Doxiadis looks towards a city which is safe and enhances a quality of life which satisfies the aspirations of the urban community promoting creativity and human development.

Depersonalisation is counteracted by the potential to develop as an individual and as a community or ethnic group. Urbanised societies are intrinsically heterogeneous in their cultural, social and economic form. Social cohesion and integration is facilitated by notions of mobility and accessibility although inhibited by the variety and diversity within a community through a natural stratification or land-use policy. That is, communities who share a common heritage, ethnic background or economic position naturally socialise and interact with communities of similar circumstance. The public realm is seen as

a space which facilitates interaction and active engagement and is set against the background of the city.

3.3. Urban Design and Health

Many aspects of the urban environment can promote health and facilitate those notions of a healthy city mentioned by Lynch (1981) and Doxiadis (1977). Modern cities can be expressed as a collection of destinations which are accessed by a series of corridors that accommodate urban dwellers fulfilling their daily rituals and acting out their lives.

3.3.1. Movement Corridors and Destinations (Thomas, 2002)

Streets, pedestrian lanes and trafficable open spaces are movement corridors which are the access ways and circulatory systems of the built environment. These corridors link a series of hierarchical destinations and can provide amenity to the urban dweller. In typical cities, these corridors are determined by the motorcar and are grid-like in orientation which ignores the socio-spatial needs of navigating through a city. This spatial network can be defined as:

- Private social space
- Open space between buildings
- The building edge of the street
- The neighbourhood street or square
- The street corner
- The main street
- The primary street
- Natural features
- Public Spaces

Private open space is normally part of the home environment or shared social space of a residential grouping which offers a transitional frontage to the public. An example would be the social gardens in the Richmond Co-operative Housing precedent and is a semi-controlled zone (see Chapter 2.2). Open space between buildings can be regarded as residual space which is often the interface between neighbours and can be utilised for spontaneous interaction

and civic behaviour. The building edge to social spaces will define and characterise the qualities of that space and can take many forms (arcaded pavements, stoeps, canopies, awnings). Here, the architectural character of the building edge can enhance the usage of that social space. Neighbourhood streets or squares create identity and orientation within and between buildings and neighbourhoods. These domains are often dominated by the motorcars in the form of parking and roadways although do accommodate additional forms of transport (bicycles, trams, pedestrians) and are places for interaction and networking (Thomas, 2002).



Figure 24: Images showing street vendors and covered street edges in Durban

In the South African context, streets and pavements accommodate additional activities such as street vendors which add another dimension and purpose to the street edge (see fig.24). The building edge often becomes critical in the way it facilitates these additional activities by providing ledges, seats, recesses or shade and enhances the activity on the street edge. The street corner is the confluence of the motorcar and the pedestrian and is characterised by increased opportunity for interaction and commercial enterprise. The corner can be a well defined place and act as a temporary place for interaction as the ebb and flow of traffic and pedestrians converge for an instant. Main streets offer enhanced social encounters and cultural portrayal as they are typically a centre of activity, culture and education. These areas are vibrant and crowded and should accommodate additional space for pedestrians, motorcars and public transport as they act as gateways and attractions. The primary street is an intense flow of movement and

provides cross urban mobility dominated by mechanised forms of transport. These streets or highways are pedestrian voids and provide fast access from one destination to another. Natural features are islands of relief to the urban environment and add a natural quality to hard urban places. Furthermore, they provide refuge and recreation and can be utilised as beacons for direction and orientation. They are ecologically diverse and can be articulated to accommodate health sustaining activities such as physical activity and community interaction.

3.3.2. Public Spaces

A public space is a venue for people to congregate and interact outside of the confines of their private domains (Mammon and Paterson, 2005:2). The public realm represents the primary and arguably the most important form of social infrastructure (Dewar and Todeschini cited Mammon and Paterson, 2005:2) and it includes streets and pavements, parks, cafes, theatres and sports facilities. These public spaces are important venues for a wide variety of activities such as social interaction and physical activity which have a clear health implication (Frumkin, 2003). They are important places for relaxation and recreation especially in dense urban fabrics where open space is at a premium. The proximity and accessibility of well-maintained public spaces which are within walking distances of neighbourhoods and workplaces can promote a sense of connectedness and promote community and social cohesion. This idea is further facilitated by walkability and pedestrianisation which encourage casual interaction with acquaintances and 'familiar strangers' (Milgram cited by Paulos, 2004) and broadens the scope and range of personal relationships beyond the home and local neighbourhood.

Spaces and places within the public realm function as the containers of collective urban life and should be seen as venues for active engagement and other activities such as reconciliation and cultural awareness (Mammon and Paterson, 2005). Public spaces connect us to places through a sense of history, territoriality, cultural heritage and architectural and cultural roots. This notion of connectedness helps to define a person's sense of self and a person's place in the world which is an idea congruent with levels of self-

esteem, self-worth and mutual support (Lindheim and Syme cited by World Health Organization, 1988). These conditions are linked to social and mental health issues and advocate that individuals should establish connections with the past, our biological and cultural heritage. Furthermore, individuals should actively participate in community activities to avoid alienation, dissatisfaction and the incidence of illness (Lindheim and Syme cited by World Health Organization, 1988). There are a number of other key ideas utilised by urban planners which consider components that contribute to improving social functioning, satisfaction, quality of life and the health of urban residents. These concepts are important in contributing to the overall health and quality of life for residents living in urban areas. These design components within the urban fabric include:

Contours/Skylines/Varieties of Height

These components promote access to natural light and ventilation and dictate the skyline of the city which contributes to the character and identity of the city. Significant buildings that exist within the skyline can be used as beacons for orientation or identification. The Manhattan or even Johannesburg skyline (see fig. 25) can become recognisable, even as a stylised silhouette, by the collection of buildings or an iconic singular element within the skyline.

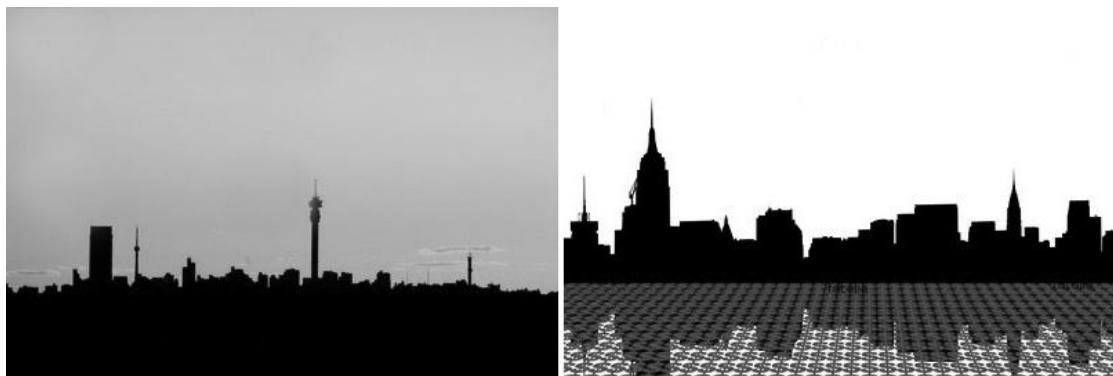


Figure 25: Stylised silhouette of Johannesburg (left) and Manhattan (right) Skyline

Land-use

Segregated land-use policy can potentially contribute to the stratification of communities and effect levels of accessibility and proximity to amenity and

services. Land-uses which are allocated by the socio-spatial needs of the urban community promote accessible, walkable and mobile communities who have sufficient access to amenities, services, employment opportunities and housing.

Road Networks/Pavements/Street Edges

These movement channels accommodate a variety of activities such as moving and static vehicles, pedestrians, cyclists, sidewalk cafes and shop fronts. The relationship between the edges of each component can facilitate interaction and provide a space for these activities (see fig.26). These spaces can be articulated or designated by informal barriers such as planters or steps to create a collection of semi-private and social spaces within the same street or pavement.



Figure 26: Sidewalk cafes activate the street pavement and contribute to the vibrancy of the street edge

3.4. The Promotion of Healthy Lifestyles as a Contributor to Urban Health

A healthy lifestyle is regarded as the steps, actions and strategies which are practised in order to achieve an optimum level of health and is a valuable resource for 'reducing the incidence and impact on health problems, for recovery, for coping with life stressors and for improving quality of life' (Langille & Lyons, 2000:13). This concept of 'lifestyle' is based on the fact that people generally exhibit a recognisable pattern of behaviour in their everyday lives and includes regular routines of work, leisure and social life. These behavioural patterns are a collection of lifestyle choices which can be categorised as having a positive or negative affect on the health of an individual. Positive health practises reduce the incidence of illness and

disease such as coronary heart disease, respiratory diseases and cancers (World Health Organisation, 1999). A healthy lifestyle is addressed through eating habits (nutrition), activity levels (physical activity) and lifestyle habits (risk behaviour) such as smoking, alcohol and drug abuse. The body requires sufficient nutrients in order to achieve basic daily tasks and an excess of unhealthy foods is linked to obesity, heart disease and diabetes. Obesity and the incidence of sedentary lifestyles are a legitimate urban challenge and promoted by a lack of public amenity, green open space, availability of healthy food and water and opportunities for light physical activity. Obesity is linked to psychological health issues such as depression and low levels of self-esteem (World Health Organisation, 1999).

Physical activity is a critical intervention to alleviating the burden of obesity and the associated chronic diseases and stimulates the bodies own natural maintenance and repair system (World Health Organization, 1999). Exercise benefits levels of stamina, strength and suppleness which develop higher levels of circulation, muscle building and ease of mobility which reduce heart disease, injuries and muscle strains. Physical activity can be achieved through passive engagement with the built environment and is promoted by a pedestrianised, walkable urban fabric and cycling as an alternative to motorised transportation. Furthermore, it can be achieved actively through the availability of social amenities such sports and recreational facilities and contributes significantly to mental wellbeing such a high self-esteem and low levels of stress. Physical activity assists individuals through an engagement with their surroundings and other members of the community and promotes social cohesion through this form of interaction. Risk behaviour such as smoking, drug and alcohol abuse are negative lifestyle habits and contribute significantly to chronic diseases such as cancers, heart and lung disease and are a source for emotional disorders and depression. Violence, accidents and personal injury are linked to substance abuse which can be rooted in social and economic pressures which exist within city neighbourhoods. Negative lifestyle habits are a source of emotional distress and linked to the pressures of everyday life within the urban environment.

3.4.1. Healthy Lifestyle Behaviour

A broader and more contemporary definition of a healthy lifestyle is a way of living based on identifiable patterns of behaviour which are determined by the 'interplay between an individual's personal characteristics, social interactions and socioeconomic and environmental living conditions' (World Health Organisation cited by Langille & Lyons, 2000:12). This definition suggests that patterns of behaviour are adjusted by changing social and environmental conditions and therefore perspectives of lifestyle must move beyond the individual. Langille and Lyons (2000) propose that there are a number of greater elements which constitute a healthy lifestyle and include:

- Effective coping: helps people deal with the challenges and stresses of life without recourse to risk behaviours
- Lifelong learning: involves the personal development of an individual and is linked mental and social wellbeing
- Safety and security precautions: in the home, school and workplace is linked to personal injury and mental stressors such as insecurity
- Social activity and volunteering: are in recognition of the social relationships that exist within health and include social cohesion and social capital
- Sense of purpose, meaning, spirituality and hope: these concepts make sense of the world and help the individual to find 'place' in their environment which is linked to mental and social wellbeing.

These elements can be addressed by looking at lifestyle as a community issue which may be influenced by a manipulation of the physical urban environment. The incidence of healthy community lifestyles can be increased by:

- Increasing the amount of green open spaces (promote accessibility)
- Remove automobiles from dense urban places (promote pedestrianisation, public transport and alternative forms of mobility)
- Build community/public facilities such as community centres, libraries, sports facilities

- Regenerating public spaces by creating destinations
- Creating supportive environments

3.4.2. Creating Supportive Environments

A strong community culture that supports health increases the health and wellbeing of the individuals within the community through interaction, mutual support and education promoting social capital and cohesion. This can be achieved through a number of promotive activities. Current health care strategy and initiatives such as 'Health for All' (World Health Organisation, 2010) attempts to address health issues within a community by providing promotive, preventative, curative and rehabilitative care as opposed to the reductionist approach of merely diagnosing and treating health ailments. The Bulwer Park Wellness Centre looks at establishing these supportive relationships by accommodating welfare, counseling and education facilities within its schedule of accommodation. Here, the role of the Wellness Centre is to provide promotive and preventative support which empowers and enables the community to understand, manage and exercise healthy lifestyle practices which contribute physically and socially to the health of the community.

3.5. Precedent Study: Kelvin Grove Urban Village

Kelvin grove is an inner city suburb situated in close proximity to the Brisbane central business district and accommodates a culturally and demographically diverse population. The urban design proposal attempts to achieve a vibrant, healthy, diverse and socially sustainable urban community that has access to a range of cultural, health and educational resources in generating healthier lifestyles and behavioural patterns.

Urban Design Project: Kelvin Grove Urban Villages

Architect: HASSEL

Context: Brisbane, Australia

Construction: 2001 to present

The project envisions an inclusive and sustainable community where people live, learn, work and play in one accessible and walkable neighbourhood in

close proximity to the additional opportunities and amenities provided within the Brisbane central business district. The urban village attempts to promote a strong inclusive community, a safe environment and an ecologically sustainable environment through a mixed-tenure, medium density urban neighbourhood based on the principles of New Urbanism.

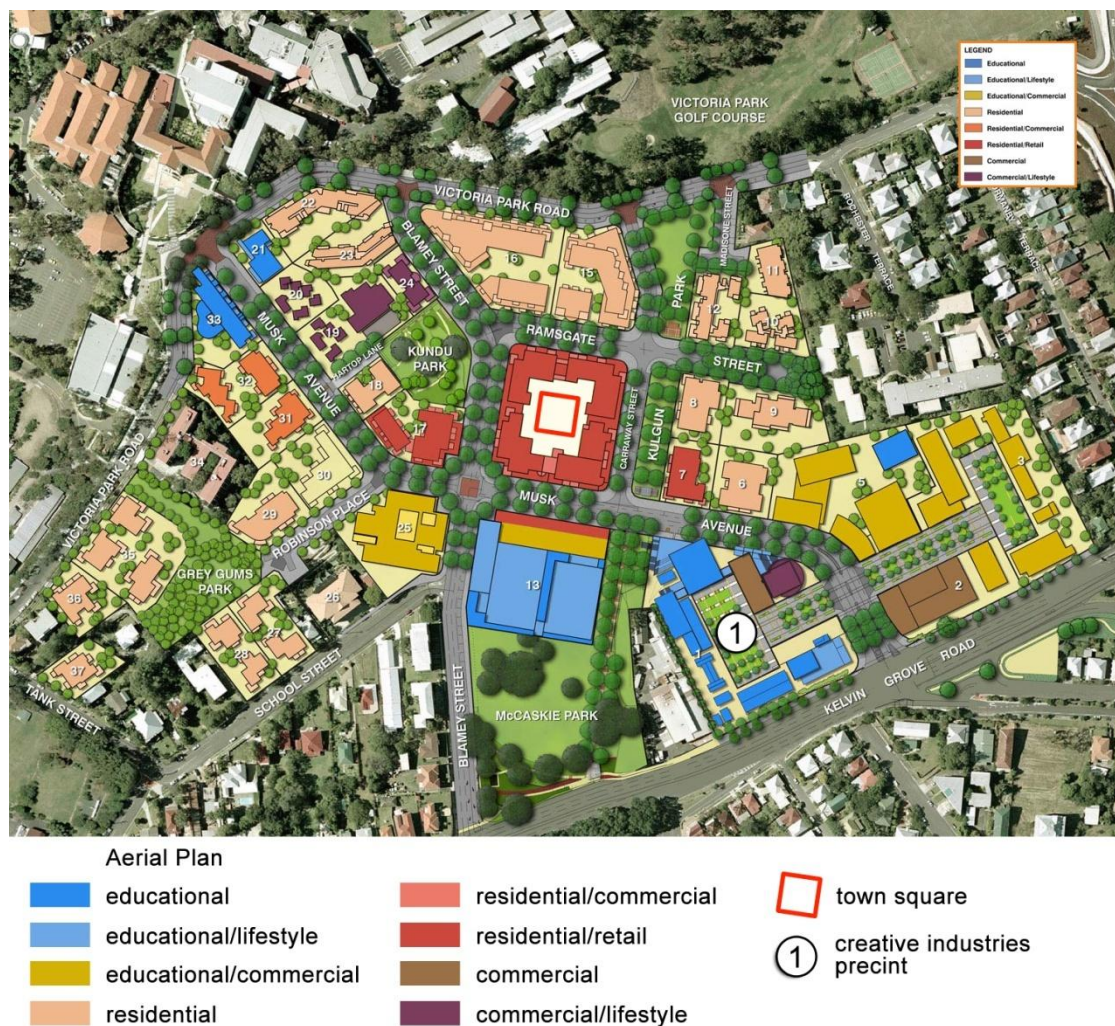


Figure 27: Aerial plan showing the land-usages, street corridors and green open spaces

Approach

The primary approach is to encourage a sense of community through a highly legible urban fabric and a human scaled environment. The intention is create an environment which is not overwhelming in terms of scale and complexity and portrays a sense that the environment has been designed with cognisance to the thoughts and needs of the community. The framework

avoids a separation of land-uses and integrates a range of zones and uses within the precinct to promote accessibility and integration.



Figure 28: Images showing the (i) pedestrian walkways fringed with landscaping and street furniture (ii) expressed entrance and walkway on building edge (iii) public artwork and sculpture

Conceptual Framework

The composition of the development looks at the traditional town design which includes a town centre, main street and business core. The main street is used for a variety of activities and incorporates the local university facilities. Residents have access to cultural, leisure and recreational activities in the centre or heart of the village. This main street is in close proximity to the residential component and enforces walkability which promotes physical activity through walking and cycling. These corridors are mechanisms for engaging with the local context and create potential cultural associations with the significant buildings and public spaces. The retail component is focussed in the heart of the village and accessed by pedestrian and vehicular corridors and terminate at a contained town square (see fig.27) which is a traditional town concept and place of social interaction and community engagement. Furthermore, the medium density development is created by maximising the building footprint on the ground floor and develops a relationship with the street. Ground floor entrances are clearly identified with awnings, landscaping, lighting and signage to promote a legible and coherent domain (see fig.28). Signage is used as a means for orientation and way finding and each

particular site incorporates signage which is visible from the street and pavement, day and night.



Figure 29: Mixed-use building that responds to the slope of the site and activates the street edge by providing a corner piazza and ground floor retail with pedestrian pavement overhangs

Mixed-use Vision

The vision proposes an integration of services and amenities and is developed as a collection of adjacent and different buildings rather than a single visually-distinct complex. This is achieved through a distinction in detailing, materials and colours which strongly articulates the environment to add variety. The buildings attempt to relate to the site, topography, climatic conditions and to one another to form an integrative and responsive architecture. The concept of adaptability is enforced to ensure that the precinct is sustainable through change. Ground floors of buildings must be adaptable to incorporate commercial or retail facilities as a response to the changing requirements and shifts in demand (see fig.29). This creates a responsive environment and further acknowledges the needs and requirements of the community. The precinct accommodates a variety of social groups within the community which contributes to the lived experiences

within the neighbourhood creating a sense of cohesiveness, understanding and commonality.

The village incorporates a variety of inner precincts which provide amenities, workplaces and essential services to the area. A creative industries precinct is dedicated to creative experiment and is utilised to promote culture and lifestyle (see fig.30). The precinct facilitates knowledge transfer and learning and allows people to experiment with art and experience creativity fostering healthy minds, empowerment and kinship which are beneficial to mental health. Artists, designers, researchers and entrepreneurs are accommodated and the precinct is a source of employment and entertainment to the community. A dedicated health precinct provides an institute and public health facilities which focus on the health care issues within the community. Here, the community are participants who inform the process of medical intervention creating a sense of purpose and worth.

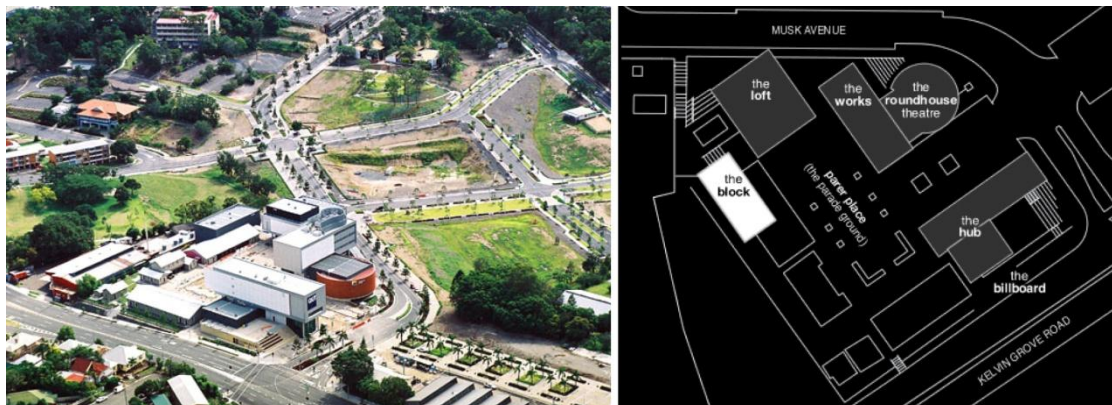


Figure 30: The creative industries precinct promoting culture and lifestyle

Ecologically Sustainable Development

Ecological sustainability ensures that the communities of the future will be accommodated by the village and promotes a sense of permanence and coherency. Social sustainability is promoted by the provision of facilities where people can meet and hold activities through shared public spaces and a walkable urban fabric and contributes to the cohesion of the community and social wellbeing. A variety of housing types accommodate a diverse and heterogeneous society which reduces stratification. Environmental

sustainability is aided by the incorporation of green areas, the restoration of indigenous trees and topographical features which creates a sense of place and identity.

Safe Environments

Community safety is a critical contributor to social and mental wellbeing. The urban framework ensures that buildings focus on and overlook streets and public spaces to promote safe, active places. This is further facilitated by transparent facades (as in the Richmond Co-operative Housing example) and serves to activate edges and animate streets (see fig.28). Entrances are designed to accommodate universal access and residences incorporate a proportion of universally accessible accommodation. Buildings step down towards the street to maximise views and visual surveillance which is enhanced by effective building and ground floor lighting. Sanitation is a particular urban health consideration and garbage collection is contained within buildings in a purpose designed, well ventilated space and not left on the street to avoid contact with pedestrians.

Soft Green Open Spaces

The provision of green open spaces forms part of a larger open space network which links into the city and is used for leisure activities, social gathering and as a place of refuge and revitalisation. The public spaces are legibly defined by the robust structure and boundaries formed by the street grid and include the provision of artwork to reflect the prominence and character of the area and location indicating the cultural and contextual relevance. These spaces are connected by a series of walkways and pedestrian pavements (see fig.31) which again promotes physical activity and creates a renewed focus on fitness for the established residents in the community. Here, fitness and physical activity facilitate healthy living and are enforced as preventative measures to sustaining to the health of the community. Semi-private social spaces are encouraged by the use of roof planes as outdoor living spaces and roof gardens which softens the urban footprint and lessens the impact of the Heat Island Effect.

Reducing Car Travel

The attempt to minify the use of motorised forms of transport and in particular the motor vehicle has a number of associated health benefits as mentioned in previous chapters (see Chapter 2.1.3.). This minimizes the use of fossil fuels and reduces air pollution. Furthermore, it increases pedestrianisation and promotes accessibility and walkability which must be translated into the articulation of the urban fabric. The framework proposes minimal ground car parking by locating these areas in non-critical zones away from retail frontages, building entrances and public spaces. These areas are not visibly obvious from adjacent streets and parks which minimizes the intrusiveness and impact of the motorcar. All residences provide at least one bicycle parking per sixteen lodging rooms to promote cycling as a preferred method of transport and encourage physical activity. The provision of public transport is centrally located and offers connections to various amenities within the precinct and the central business district. The use of public transport brings members of the community into contact with one another and promotes casual interaction and social engagement.



Figure 31: Images showing expansive pavements with pedestrian and cycling paths, sufficient lighting and landscaped edges

Conclusion

The Kelvin Grove Urban Villages looks at urban planning as a mechanism to promote health sustaining activities and social and mental wellbeing by providing a medium density urban footprint which is linked by access corridors and streets that accommodate motorists, pedestrians and cyclists. The land-use policy ensures that amenities and services area accessible to the community by a variety of transportation modes within a walkable, legible and

coherent urban fabric. The precinct is activated by ground floor retail and commercial enterprise which animates the street edge and promotes interaction. Furthermore, a comprehensive green open space network provides rest and leisure activities and lessens the environmental impact while promoting physical exercise as a health sustaining activity.

Chapter 4: Case Studies

4.1. Introduction

The literature review and theoretical framework have explored the relationship between the built urban environment and health with reference to the epidemiological and social health considerations of urban communities. The research has explored the health consequences of urbanisation through a chronological investigation and identified the key issues and challenges. Furthermore, the precedent studies and theoretical framework have revealed a number of concepts and interventions which minimise the effects of the urban environment and promote physical, mental and social wellbeing with particular relevance to urban design and architectural solutions. The research now looks towards a building type as a solution to sustaining urban health and will explore a South African urban precinct as a case study. The aim is to develop an understanding of the local urban health challenges and fundamental issues in order to suggest and motivate a relevant type of architecture or building typology which will facilitate and promote urban health. The research acknowledges that varieties of building types are applicable and motivates the outcome as one potential solution.

4.2. Case Study: Hillbrow Health Precinct

This case study will investigate the history of the Hillbrow district in order to identify the salient urban challenges and health consequences. The relevant interventions will be explored as sustainable solutions to urban health, based on the broader definitions defined earlier in the investigation.

Hillbrow is a predominantly residential district within Johannesburg and has experienced rapid degradation and a decline in the social and urban fabric over the past half century (Harrowitz, 2010). The precinct is home to a variety of foreign emigrants living in overcrowded, unsanitary, insecure conditions lacking sufficient access to amenities and services. A number of Government initiatives have been implemented to combat these issues and reinvigorate the area. The Hillbrow Health Precinct is an inner city zone within the district

which previously accommodated a number of health facilities and has been earmarked for redevelopment as a health sustaining urban node.

The Hillbrow district is situated at the base of the Constitutional Hill precinct in close proximity to the low scale, residential suburb of Berea (north west), Braamfontein (west), Joubert Park (south) and the Park Railway Station (South) which provides public transport to and from the city (see fig.32).

History of Hillbrow

Hillbrow was established in the late 1800's as a low-scale suburb which had strong links to public transport (Hospital Hill Tram), access to job opportunities and was portrayed as a healthy and fashionable part of Johannesburg (Clay, 1982 cited by Silverman and Zack, 2005). The urban scale intensified during the 1920's as the double storey detached houses were replaced with medium sized flats by property developers. The post World War II industrial boom altered the physical fabric and replaced these flats with high-rise, high density 10 storey modernist flats as the district resonated the powerful social and economic conditions of the time (Silverman and Zack, 2005). Further high-rise construction was spurred by the housing demands and good employment levels of the manufacturing boom. The area portrayed the cosmopolitan lifestyle of cafes, clubs and late night societies and became an entertainment magnet for white middle and upper class society which was further facilitated by legislation such as the Group Areas Act.

Hillbrow functioned as a high density, primarily residential neighbourhood from the 1970's until a marked shift in the demographic makeup of the area in the 1980's. The flight of whites and Europeans and the incidence of military conscription supported low vacancy levels within the area and facilitated the housing shortage for coloured, Indian and blacks despite Government legislation. Rent hikes were the consequence of capital flight from the area and led to subletting, overcrowding and a strain on building services. Buildings began to deteriorate from a lack of maintenance as drug trafficking, prostitution, crime and theft impacted negatively on the quality of life and brought fear and insecurity to the local community. Foreign immigrants

relocated to the area in search of employment opportunities, services and transportation and created a new competition within the district for these amenities. This new heterogeneity of the population evolved into a fragmented society due to the tensions between locals and foreign immigrants and saw a total collapse of the tenant organisation.

The Post Apartheid Era and Current Situation

The new democratic Government inherited a dysfunctional, unruly segregated community within a dilapidated precinct with diminished services, amenities, opportunities and welfare. Hillbrow now facilitates a wide range of uses with a strong residential and business component. Buildings are developed right to the street edge creating a tight, constrained urban character with an absence of interstitial spaces and constrict a freedom of movement for the flow of pedestrians. Street trading takes place on narrow congested pavements or at the ends of service lanes and generate large amounts of solid waste creating an unhygienic and insanitary urban environment. Many of the abandoned and derelict flats have been reoccupied to accommodate these traders as well as crèches, churches, shops, hairdressers and shebeens. The high population density and overcrowding has increased the strain on services and sewage systems and promotes the rapid spread of disease and fire due to a lack of access to natural light and ventilation and the unhygienic living conditions (Silverman and Zack, 2005). Spaces such as lounges and enclosed balconies are independently rented out to facilitate the high demand for accommodation which has impacted the social and mental wellbeing of the urban community due to a lack of private and social spaces within the home.

The Mental and Social Impact on Health

The threat of crime and violence has contributed negatively to levels of safety and security and promote tension and stress. The lack of available amenity has spurred local building owners to provide hairdressers, crèches, churches and small plaza shops within the confines of the buildings themselves. The intention is that occupants would not have to go outside to have their needs satisfied although this hinders the possibility for casual interaction and social engagement. These buildings harbour fairly homogenous communities with

similar socioeconomic circumstances and have become comparatively self sufficient due to restricted and controlled access and fortification (Silverman and Zack, 2005). This level of security has promoted an inherent safeness and a sense of identity as people live with and around others with whom they identify due to similar social circumstance and cultural upbringing. Despite this, the lack of additional social engagement with neighbouring community members is a contributor to diminished social awareness and cohesion and reduces social capital (Langille and Lyons, 2000).

A lack of employment opportunities has increased the prevalence of informal traders who set up their stalls on streets, pavements and open spaces in order to sell their goods to passing pedestrians and motorists. The lack of applicable space means that the pavements outside the residences have been exploited by landlords and re-privatised promoting congestion and restricted pedestrian flow. Public spaces have been reused for private business with constricted access and are ill maintained, unsafe and lack services. Generally, the Hillbrow community have been alienated from the collective wealth of the city with a lack of access to proper health and educational services while living in a segregated, closed society with little social amenity and in fear of violence and crime (Silverman and Zack, 2005).

Towards a Solution

A range of significant regenerative and combative initiatives have been compiled. In particular, the Hillbrow/Berea Regenerative Initiative and the Hillbrow Health Precinct Initiative look at urban and institutional proposals which attempt to address the salient health issues within the community.

4.2.1. Hillbrow/Berea Regenerative Initiative

This program aims to significantly enhance the residential neighbourhood and business/recreational functions by providing for its marginalised and vulnerable inhabitants (Silverman and Zack, 2005). Five strategies are proposed:

- An adequate, well functioning municipal infrastructure which provides the necessary sanitary and sewage requirements
- Access to urban amenity, facilities and services
- The ability to absorb new entrants and support marginalised citizens
- Development of mixed use, high density residential neighbourhoods
- A local and regional business and entertainment centre or strip

4.2.2. Hillbrow Health Precinct



Figure 32: Aerial map showing Hillbrow Health Precinct in relation to the surrounding districts

This initiative comprises an agglomeration of institutional land-uses which are predominantly a collection of health facilities and laboratories. This precinct will work in conjunction with other developments surrounding the precinct such as Constitutional Hill, Braamfontein Regeneration, Park Station and Joubert Park and forges a link between these projects (see fig.32). A significant portion of the buildings within the health precinct are heritage buildings and cannot be demolished. The proposal is to refurbish and reuse these buildings to accommodate health related facilities and functions to which an associated health benefit is achieved. The heritage buildings are maintained as cultural and heritage icons which exist within the urban fabric

as reference to the history and purpose of the precinct. Here, a sense of permanence and identity is achieved and promotes mental and social wellbeing through the legibility and coherency of the cultural and heritage associations (Mammon and Paterson, 2005).

The urban design framework proposes a number of concepts and solutions and includes:

- Making connections
- A grid of streets
- Public open space network
- A mixture of land-uses
- Identify landmarks elements

Making Connections

The framework proposes a reorganising of the traffic system into a two-way vehicular system which decreases the intensity of the traffic flow. Dedicated pedestrian links to and from the health precinct will improve public accessibility to facilities within the precinct and improve the connectivity to the public facilities and activities in Braamfontein, Hillbrow, Constitutional Hill and Joubert Park.

A Grid of Streets

A grid enables accessibility to all users and allows for choice and variety of movement within the precinct and through to adjoining areas. Due to the complexity and density of the built form and the retention of the many heritage buildings, a public environment grid will be established and comprises:

- Pedestrian paths and routes
- Public piazzas
- Parking courtyards
- Vehicular access
- Making connections between the surrounding fabric and the associated activities within the precinct

The public environment will be supported by active ground floor uses and designed for human comfort and include landscaping, lighting, wide pavements, level crossings, furniture and way-finding signage systems.

Public Open Space Network

The network incorporates public open space running across the east-west axis and the original Hillbrow Hospital Building will form the primary focus of the precinct (see fig.33). A linked network of public spaces at key places is proposed to include parks, piazzas, squares and connections via pedestrian paths and walkways.

A Mixture of Land Uses

This allows for a diversification of economic activity and forms a synergy with social housing, formalised informal trading, and offices for NGO's and HIV/AIDS research.

Identify Landmark Elements

Imageability and legibility is a key concept in promoting an understanding and coherency of the urban fabric. Gateways will be utilised to acknowledge arrival or departure at a place having a collective character, function or activity. Local nodes such as parks and piazzas are used to create focal points to areas where more than one node exists. These elements should be visually related to one another in order to enforce a sense of identity. Edges are used to define the health precinct from the sub areas. Landmarks are crucial to establishing a sense of place which is achieved through scale, location or architectural significance and is vital to forming a set of references across the precinct. Axial vistas create a visual relationship between landmarks and the surrounding areas. Existing natural features such as trees will be retained and the public spaces will be developed with a unique character and promotes public art programs which offer a vehicle for expression and creativity within the urban environment.



Figure 33: Figure ground study showing street grid structure with proposed pedestrian routes, the green open space network and retained heritage buildings

Implementing the Urban Design Framework

The health precinct is structured into four quadrants in order to reinforce the principle of creating cross roads. Quadrant one (see fig.33) is the north-east corner and accommodates a series of clinics, a youth centre and support NGO's. Quadrant two is the remaining south-eastern portion which incorporates the Old Hillbrow Hospital complex which has been identified as a heritage building. Quadrant three houses a mixture of uses such as education, residences and private and public medical facilities. The final quadrant four accommodates the laboratory services.

The crossroad which is created at the intersection between Kotze Street and Hospital Street forms a crux around which the identity, public image and functionality are formed. This crux acts as a seam which provides vehicular and pedestrian access to each of the quadrants and enables permeability and connections between these zones. The corresponding green open space park A (see fig.33) sits at this crucial intersection and connects visually to a vacant site B and forms a critical link to the Joubert Park as a continuation of the green open space network. The crux offers the precinct a sense of legibility and assists in orientation towards the individual quadrants. It is a cohesive entity which promotes the imageability of the precinct as a coherent and interpretable health node with four perceivable quadrants with a direct visual connection to a series of connected vistas of parks and green open spaces. The public space 'A' has been designated as a public recreational area which is at the heart of the precinct and represents the public interface with the institutional domain of predominantly health care facilities. Here, the precinct is essentially developed around a redeveloped, safe, secure and functional public facility. Park 'B' (see fig.33) is proposed as a multi-functional space which provides for a single storey structured vehicular parking. The surface of this parking facility will accommodate a public park which provides for a residential recreational facility (play area, relaxation, physical activity) and is conceived as a virtual waiting area for the precinct. The park includes retail activities on the form of formalised informal trading stalls which supply eating, personal services, hairdressers and fruit and vegetable stalls.

The four quadrants are connected by a system of public environment linkages in the form of pedestrian pathways, parking courts and public areas. The network breaks the quadrants into smaller parcels and establishes a fine grid. The primary pedestrian link is east-west and connects Esselen Street to the green open space and Braamfontein via the Metropolitan Council Building. The secondary connection links Kotze Street to Smit Street through the Old Hospital site. North/south linkages are created to forge links between Constitutional Hill, Park Station and Joubert Park by linking into the public open space network (Park A).

These linkages are envisaged as a series of corridors which facilitate connectivity and promote walkability within the urban domain. Furthermore, they promote physical activity and casual social interaction while providing an imageability and sense of place as community members are orientated through the precinct and experience the heritage and culture of the area via the refurbished buildings and views towards Constitutional Hill.

Towards an Architectural Solution

The research looks towards an architecture and building type that facilitates health within the local community and promotes urban wellbeing. Many institutional facilities such as community health centres, hospitals, laboratories and clinics are provided which focus primarily on the epidemiological profile and issues within the community. These facilities lack the promotive and preventive services and social amenities that encompass the concept of health as a holistic concept that has been suggested during this investigation.

4.2.3. Lefelo la Thlokomelo Wellness Centre

A significant initiative has been the Lefelo la Thlokomelo Wellness Centre project which is unique and diverse in the range of services it offers to the local community. The facility is housed within an old refurbished building within the precinct and provides a support hub for the disadvantaged members of the community facing the social and epidemiological challenges of urban living. The Wellness Centre provides for a number of additional or extraordinary services which provide support and education to the community as a supplement to the services received at the community health centres and clinics. The Centre provides an internet café for access to information and communication and fosters self-initiated research and education. Income generation groups' offer programmes on entrepreneurial incentives which could provide a stable form of income and promote self-employment. A number of support services are offered to refugees, sex workers, youth and youth carers, women, men and couples which create a supportive environment for the community. The Wellness Centre has a 24 hour child crisis centre and a home based care facility which educates the community on basic health care best practise within the home environment.

This building type is relatively unique in its collection of services and a similar notable concept has been identified for the Durban Central Business District.

4.3. Case Study: Bulwer Wellness Centre

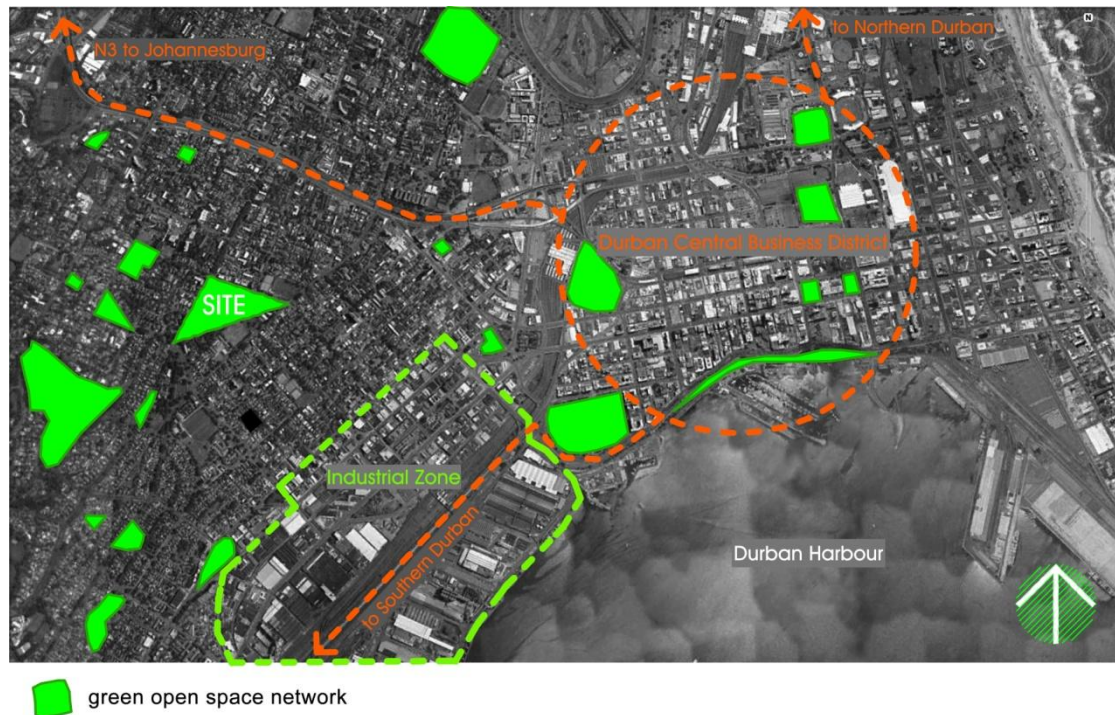


Figure 34: Location plan showing the site in relation to the Industrial Zone and Durban CBD and includes the green open space network

Project: Bulwer Wellness Centre

Architect: Metropole

Context: Bulwer Park, Berea, Durban

Construction: Design Concept Stage

City Life is a faith-based, non-profit group with a vision to be involved in activities that bring 'life to a city' and which contribute to the healthy urban living. The group include a number of healthcare academics, paediatricians, doctors and engineers who have identified the need to accommodate the City in health, welfare and recreation in order to promote the overall wellness of the community. The Group have partnered with City and Provincial Government in dealing with the HIV/AIDS and Tuberculosis burden to provide a facility which accommodates the treatment of these communicable diseases

and provide promotive and preventative care and education in fostering a healthy urban community.

Identifying the Need

Preliminary investigations by the group identified a number of social and epidemiological issues experienced by local communities. Many of the residents (55-70%) are of working age (20-65 years old) and find employment in the large industrial area situated around the city's harbour (see fig.34). Less than half of the community have a matric education and less than 60% of the community are employed or economically active at all (Spooner, 2010). A number of social and mental issues such as hypertension, stress, low levels of self-worth and diminishing self esteem are attributed to these statistics (Spooner, 2010). Furthermore, City Life have identified that much of the local population are burdened by HIV/AIDS and Tuberculosis and regularly seek treatment and medication which is only available at a limited number of centres within the area after working hours. Secondly, Bulwer Park as a social and recreational amenity is currently a derelict, crime ridden and under utilised space within the area. City Life has proposed a regeneration of the park and the inclusion of a Wellness Centre to provide a combination of basic treatment, screening and healthcare with a number of educational, supportive and social upliftment services to facilitate the needs of the local community and promote health as a holistic idea.

Context

The Bulwer Park site is a green public space which sits within a larger green open space framework (see fig.34) influenced by the principles of the Garden City Movement (Howard, 1898). The site is fringed by major access routes to the university, lower harbour industrial area (Umbilo), the southern residential suburbs and schools and the Durban Central Business District (see fig.34). The north-eastern and north-western boundaries are lined and well defined by low to medium rise flats and semi-detached houses although suffer a lack of edge definition on the southern and south-eastern boundaries (see fig.35). This boundary accommodates residences, schools, sports facilities, an art gallery and a number of reused residences which operate as small business

and restaurants under special consent. The site is used as a pedestrian access way or movement passage as the community move to and from the local suburbs and the Durban central business district and industrial area to the south (see fig.35). Despite this, the park is under-utilised as a place for relaxation and rejuvenation and has deteriorated due to the high levels of crime (Spooner, 2010).



Figure 35: Figure ground study showing site, pedestrian routes and relevant building uses

Park Regeneration

A key reason for this is that traditional park master planning concepts treat parks as aesthetic objects which often results in a place that is pleasant to look at although utilised by few people. Typically, a visitor would use the park once and find that few engaging activities existed which made it less likely for them to return (Project for Public Spaces, 2010). The contemporary approach is to create a destination or a series of activities within the park that would

facilitate the many functions of community life which promotes a sense of ownership and connectedness and regenerates the area as a usable public space. The project suggests that a nominal percentage of the park (4%) be utilised for a Wellness Centre as a source of amenity and services and begins to identify the site as a destination.



Figure 36: Site plan showing the positioning of the Wellness Centre and track within the Bulwer Park

Concept

The architects have theorised the building as a 'leaf' which nestles harmoniously amongst the existing flora of the site and sits at the foot (south-eastern corner) of the downward sloping site (see fig.36). The slope creates an amphitheatre which is centred on the building (or 'leaf') and becomes a stage and backdrop to the park (see fig.39). The Centre provides a range of community services which hosts a variety of demographic and cultural needs

as a mechanism to bring the community together in one facility, promoting interaction and active engagement.

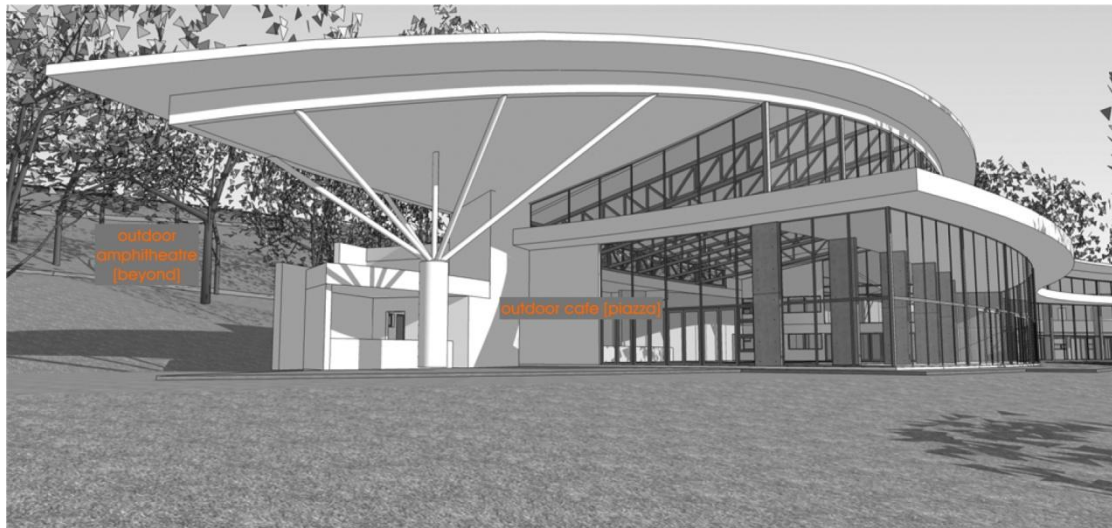


Figure 37: Perspective of outdoor café/piazza with amphitheatre beyond

The Wellness Centre comprises three primary zones or components; the public, social service and primary health care components.

Public Component

The primary space in the design scheme is a multi-purpose 1000 seater auditorium which can be utilised as a functions and events facility, a theatre, primary meeting space and accommodates the need for an additional hall/auditorium facility prioritised by Glenwood Preparatory School at the outset of the project (see fig.35). The auditorium includes a back of house (backstage) area which feeds onto the stage and opens up to the auditorium and the outdoor amphitheatre mentioned earlier. Furthermore, this space can be reused as an indoor sporting facility accommodating netball, basketball, volleyball and Futsal (FIFA endorsed indoor soccer). This space engenders a culture of rich and poor coming together through the medium of sport and promotes physical activity (Spooner, 2010). A coffee shop sits adjacent to this space and forms a piazza at the termination of the building (see fig.37). This contributes to the sustainability of the Centre and ensures that the facility is utilised during more hours of the day and is able to generate a nominal income.

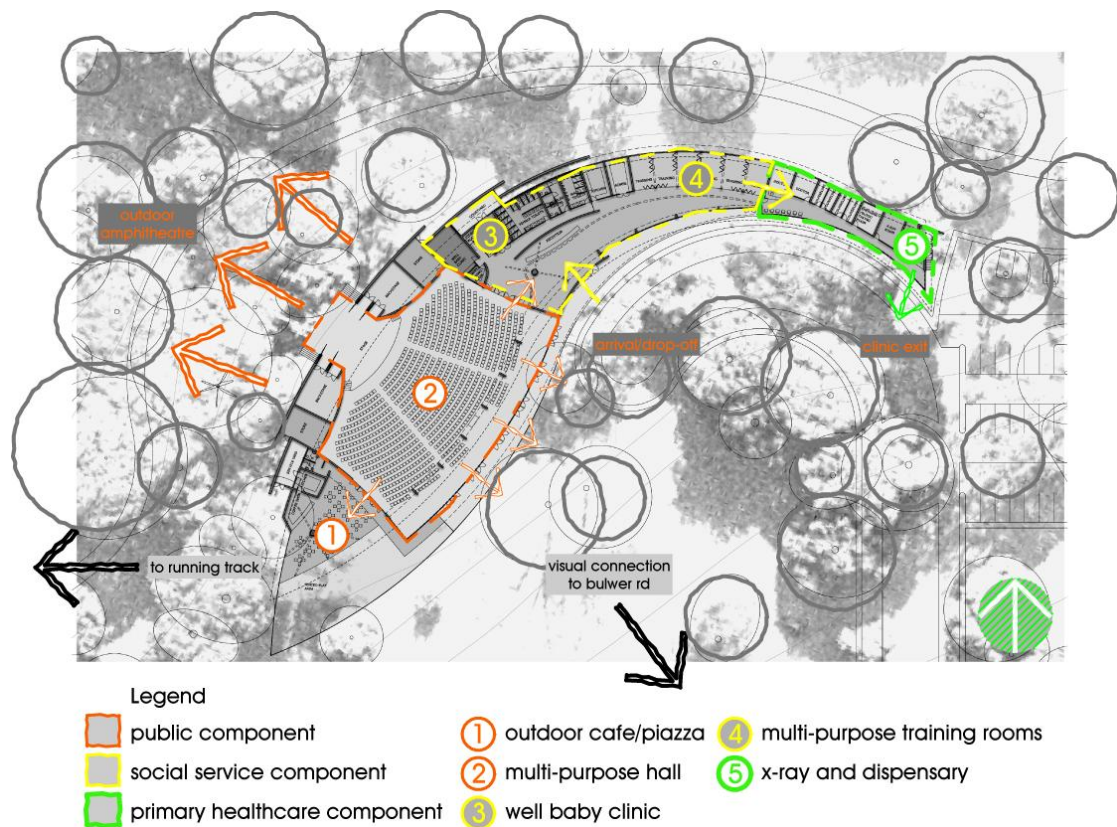


Figure 38: Plan showing the organisation of the three primary zones, the visual to connection to Bulwer Rd and the potential outdoor amphitheatre

Primary Healthcare Component

This is essentially a clinic which caters for the primary healthcare concerns of the community. The clinic provides HIV/AIDS and Tuberculosis education, counseling, testing and after hours drug collection (dispensary) until 7pm which minimises lost working hours. A fulltime onsite medical officer and clinician, nurse and six trained counsellors provide counseling and testing to HIV positive community members and promote the 'know your status and CD4 count' principle (Spooner, 2010). The clinic has an onsite Chest X-ray and Ultrasound machine and includes a small laboratory for Tuberculosis screening. Counsellors offer family planning and home based car support. A well baby clinic is a separate baby friendly area and offers baby weighing and growth monitoring, breastfeeding counseling and support, nutrition education and advice for mothers, family planning and immunisations which have been identified as a thinly provided service within the area (Spooner, 2010).

Social Services Component

The project is underpinned by a comprehensive commitment to community and personal upliftment through education and the creation of a supportive environment and a sociable facility. Furthermore, these additional services support effective coping (see Chapter 3.4.1.) and help the community deal with the stresses and challenges of life. The ground floor houses a collection of multi-purpose, adaptable training rooms which are used for a range of exercises and supportive services. These services are aimed at assisting the community with their daily lives and providing them with information, support and life skills training.

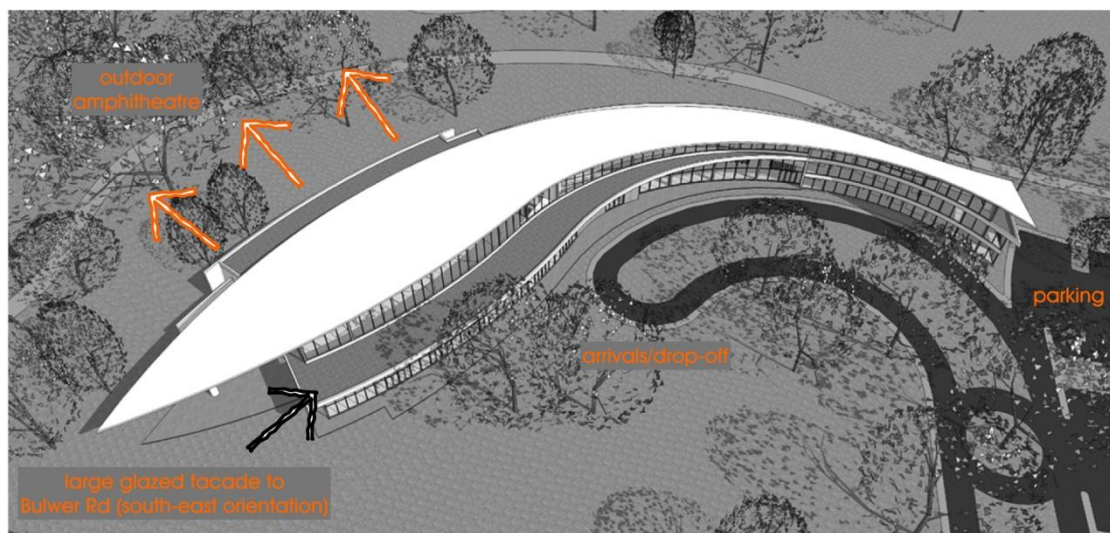


Figure 39: Perspective showing outdoor amphitheatre and large glazed front facade

Seminars are offered to families and independent family members and include parenting and marriage courses, paternal leadership workshops and divorce recovery programmes. A lack of employment opportunity and the financial pressures of contemporary living are cause for stress, anxiety and low self worth (Food and Agriculture Organisation of the United Nations, 2009). The Centre offers seminars on personal financial planning and entrepreneurial skills training to inform and empower community members to generate reliable sources of income and maintain amicable standards of living. Many people are under qualified or uneducated and the facility offers adult literacy and English lessons and assistance courses which show people how to perform relatively trivial tasks such as drawing up a Curriculum Vitae and filling in

grant applications and Government forms. The range of support services is potentially endless and the primary consideration here is developing an understanding for the needs of the community and facilitating them within the multi-purpose space provided.

Physical activity and Healthy Lifestyles

The regeneration of the park is supported by the inclusion of a 1km continuous running track (see fig.36) which winds through the trees and includes urban furniture and sufficient lighting and signage. Permanent patrolling security guards increase perceived levels of safety and the rejuvenated park will provide not only a place for physical activity and interaction, but a place of rest, sanctity and relief from the pressures of daily life such as work, school, commuting and personal stressors. The Mandala of Health (see Chapter 1.3.6.) identifies this psycho-socio-economic environment as a key contributor the balance of health.



Figure 40: Perspective showing strong visual connection and the transparency of the south eastern façade

Building and Environmental Response

The form is a predetermined reference to the natural beauty of the site (Tarbotton, 2010). The building is essentially double storey with a generous

double volume over the waiting areas and circulation zones (see fig.41). The primary, dominant façade is the south eastern frontage which is generously glazed and promotes access to natural light and ventilation. Furthermore, the transparency of the building emphasises the strong visual connection with Bulwer Rd and informs the surrounding community of the function of the building creating a sense of identity and purpose (see fig.40). A direct visual link to the inner workings of the building illustrates how people and community members utilise the spaces and begins to activate and animate the façade of the building by creating a strong internal/external relationship. Furthermore, the building is a coherent domain as the internal spaces are linearly ordered and visible from both inside and outside the building.



Figure 41: Perspective showing double volume of the multi-purpose auditorium which accommodates functions, recitals and sporting activities

Conclusion

The Bulwer Wellness Centre is a prototypical concept which incorporates a range of primary healthcare, social service and public engagement activities which are facilitated by adaptable and multipurpose spaces at various scales. The form is a rather literal interpretation of the character and significance of the site through the depiction of a 'leaf' that rests effortlessly within the natural vegetation. The form of the building overlooks an expression of the heritage and cultural of the precinct although chooses to acknowledge and accommodate these ideals by providing a multi-purpose, transparent and

legible facility that is usable by all members of the community. In this way, the building uses interaction and social engagement through activity to promote physical, mental and social wellbeing.

Chapter 5: Interventions

5.1. Introduction

The course of the research has uncovered a variety of concepts and examples which identify key mechanisms in which urban health is facilitated by the built environment. The role of architecture in fostering healthy cities looks at the health of the public as the key determinant of a healthy place as cities are the ecological habitat of urbanised human cultures. The architectural concepts manifest as an accumulation of contrasting relationships; for example:

- natural and man-made
- solid and void
- public and private
- high and low scale
- intensification and open spaces

The relationship and the tension between these elements and how they interact with urban society is effectively the architecture which sustains the health of urban places. This chapter is a collation and synthesis of the fundamental architectural concepts and interventions.

5.2. Planning Policies

5.2.1. Land-use Policy

Traditional land-use policy, as mentioned in the Sprawling Cities chapter (see Chapter 2.1.5.), prioritised the automobile as the primary mode of transport and promoted segregation through incremental development patterns and single-use zoning. A compaction of land-uses looks at densification as a mechanism which promotes urban health. Concepts such as Smart Growth (Frank, Kavage and Litman, 2005) endorse the intensification of the urban fabric and the integration of land-uses to promote accessibility to amenities and services and to encourage inclusive, heterogeneous societies. This close proximity to resources is facilitated by a high quality pedestrian environment

and looks at active forms of transport such as walking and cycling as a form of mobility. Compact residential development puts more people into contact with these amenities and services and is most effective where habitual activities (home, work, school) are co-located with uses that are used less habitually such as entertainment and retail (Frank, Kavage and Litman, 2005). The location of public facilities become more accessible to the community and increases the proximity between these destinations.

Mixed-use construction or development is the manifestation of this concept into the building fabric and comprises a mixture of uses within a particular building or node. This idea incorporates business, retail and residential components to promote a level of sustainability or a sense of permanence and is supported by densification to counteract de-urbanisation and sprawling cities. The ground floor is usually the interface between the building and the public realm and can accommodate either retail or commercial activity to activate the building edge and contribute to the quality and vitality of the street.

5.2.2. Traffic

Contemporary cities are automobile intensive domains and the dissertation has identified and motivated pedestrianisation and the exclusion of the motorcar as a significant contributor to physical health and mental and social wellbeing. This can be achieved in a number of ways. Traffic calming decreases the speed and intensity of the urban street and can be achieved by the use of speed bumps, changes in surfaces, street trees and an increased number of crossing points. The traditional street grid (or gridiron pattern) is the most efficient mechanism of achieving a maximum number of crossings (see fig.42) and are regarded as additional spaces where people meet and interact (Frank, Kavage and Litman, 2005). These crossings should be safe and accommodate the pedestrian and cyclist with ramps, waiting zones and pedestrian crossings.

City streets should become narrower places that include cycle and bus lanes, minimal on street parking and sidewalk networks. The sidewalk acts as an

additional public space and can be reorganised with the use of furniture, planting, changes in level and awnings to create a variety of public and semi private spaces.

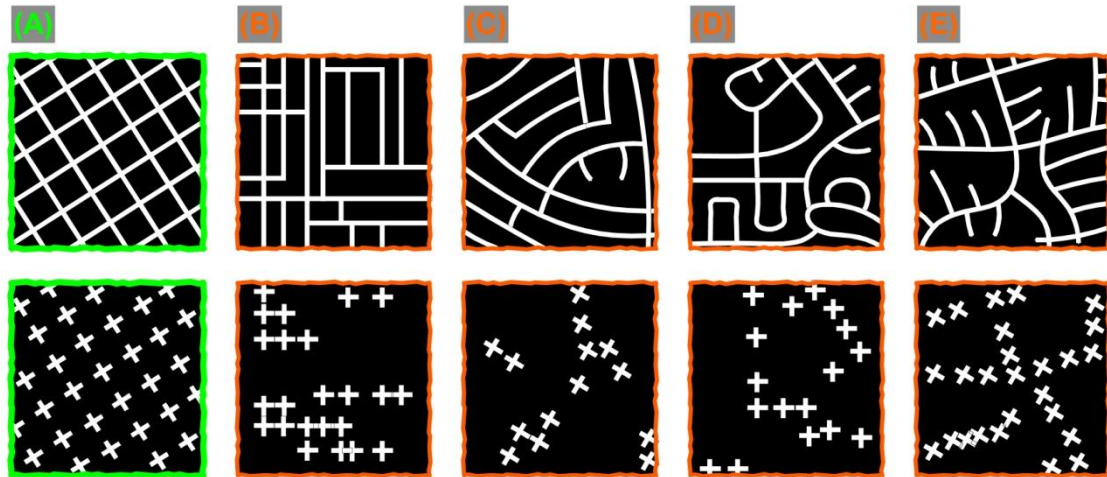


Figure 42: Diagrams showing the gridiron pattern 'A' as the most efficient at creating intersections for traffic calming

The inclusion of cycle and bus lanes promotes the use of public transport and reduces congestion and pollution. Bicycle facilities could be offered in retail, places of work and residences (such as in the Kelvin Grove Urban Village precedent study) or at multi-nodal interchanges where commuters can travel by bicycle and transfer to a bus or train such as in the 'park and ride' concept.

An effective public transport system with sufficient access and drop-off points is an efficient way of moving through the city. Accommodating these facilities underground reduces the number of road networks, highways and fast moving transportation corridors which act as divisions within the city and promote segregation. Buildings can be orientated close to the sidewalk with parking behind or below to minimise the visible car network and free up sidewalk and pavement space for public activity. Pollution levels are lowered and fewer injuries occur with the reduction of motor vehicles and decrease the necessity for ground floor parking. The Hillbrow Urban Design Framework looks at a use of the topography to create a split level, single story parking facility with roof top green open space to minimise the incidence and impact of the motor vehicle in the inner city (see fig.43). Furthermore, the ground floor car park will

not be visible when approached from the second level or while walking down the street due to the green open space above.

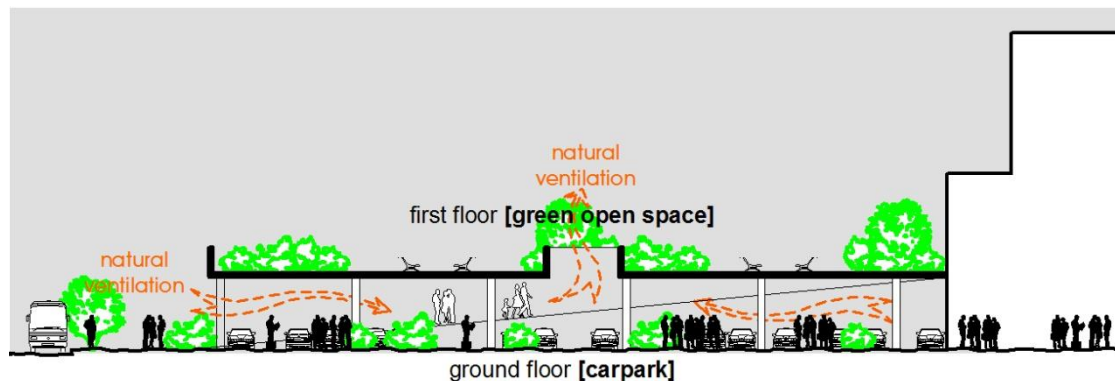


Figure 43: A conceptual image showing the split level which creates a ground floor car park, promotes natural ventilation and is roofed with a green open space

5.2.3. Green Open Space Network

A comprehensive green open space network contributes to the quality of the physical and natural environment, is a place for refuge and rehabilitation, physical activity, social interaction and community engagement and is associated with a number of social, mental and physical health benefits. The preservation of the natural landscape maintains ground water levels and lessens the amount of hard, impervious surfaces which collect chemicals and contaminate water. Furthermore, the vegetation aids in the purification of noxious air pollution, reduces carbon dioxide and increases oxygen levels. A network of interconnected green open spaces creates a route through the city and is vital to forming a set of references which creates a legible and coherent map for orientating through the city (Lynch, 1981)

5.3. Urban Design Strategies and Concepts

5.3.1. Effective Public Spaces

Public spaces have been motivated as critical civic spaces within the urban environment that are engaging, informative and cohesive and provide a place for refuge, reconciliation and cultural awareness (Mammon and Paterson, 2005:2). An effective public space is a spatially defined, sociable space with an inherent scale, character and intensity which is legible, accessible and

usable by the greater community. The research has explored the numerous social and mental health benefits associated with effective public spaces. The research also suggests that public spaces should incorporate a series of activities which help to define this inherent character of a space and promote it as a destination (as in the Bulwer Wellness Centre). These activities should be community derived and address the social and physical needs of the community in order to promote a sense of ownership and social connectedness.

5.3.2. Walkable Cities

A walkable city recognises the need for a human scaled urban form by creating well articulated streets, pathways and corridors to navigate through a city. The Kelvin Grove Urban Village study provides generous sidewalk avenues (see fig.31) and uses planting and urban furniture to create informal boundaries and edge definition. Street and trail networks are designed to be highly interconnected to reduce time and distances between destinations. This provides access to life sustaining amenities such as services, employment and recreation and promotes physical activity and a freedom of mobility. These networks could incorporate public art or illustrate restored heritage buildings (such as in the Hillbrow Health Precinct) to create associations with the identity of an area and create a sense of place and connectedness. Walkability creates a permeable environment which acknowledges the socio-spatial requirements of a person on foot who is able to access spaces more freely than those who commute in automobiles. Furthermore, a walkable urban fabric creates spaces and opportunities for casual interaction which promote a sense of community and fosters social capital.

5.3.3. Urban Agriculture

The research motivates that urban planting and community gardening are a critical intervention into alleviating the burden of unhealthy urban environments and promoting health and wellness. Domestic gardens are a source of nutrition and dietary education, promote physical activity and social engagement (refer to the Richmond Co-operative Housing Development) and facilitate the cooling of internal spaces through evaporation. Furthermore, roof

top gardens diminish thermal heat gain and regulate ambient temperatures while combating the health burdens associated with the Heat Island Effect. These gardens can be utilised as social spaces and their inclusion into the building fabric can create a series of voids, stacks and overhangs which promote access to natural light and ventilation.

The Bulwer Wellness Centre has proposed a domestic agriculture program which will supply a 9m² garden bed at a nominal cost that will provide a sustainable source of fresh fruit and vegetables for a generously sized family. These beds are economically sustainable as the produce can be sold to recoup costs within a three month period (Spooner, 2010).

5.3.4. Transparency

The relationship between the inner dynamics of buildings and the public realm create a place of powerful civic presence through the mechanism of transparency. A strong outside/inside connection reveals the activities and purpose of the space within the building and allows the space to be perceived, interpreted and understood. A rational sense of identity and connectedness are facilitated by the legibility and coherency of the building. Furthermore, transparency can be utilised as a form of orientation through a building. The Richmond Co-operative Housing Project and the Bulwer Wellness Centre utilise generous glazing to create this sense of transparency and reveal the inner workings of the space to animate the street edge and identify the purpose of the building.

5.4. Building Articulation and Housing Concepts

5.4.1. Stepped Terracing

This concept was identified in the Plan Voisin (Le Corbusier, 1925) study and uses shifts in the floor plate to create a civic scale on the ground floor. The shift creates additional spaces which can be utilised as social or semi-private spaces or for planting or balcony areas (see fig.44). This reduces the scale and intensity of the typical urban skyscraper and offers access to natural light and ventilation. Views of the street are maximised and experienced from the

controlled spaces that these shifts create and offer a visual surveillance of the street promoting security and safety (see fig.44). Furthermore, the scale allows for casual interaction with pedestrians on the ground level and mediates a connection between the public and private domain.

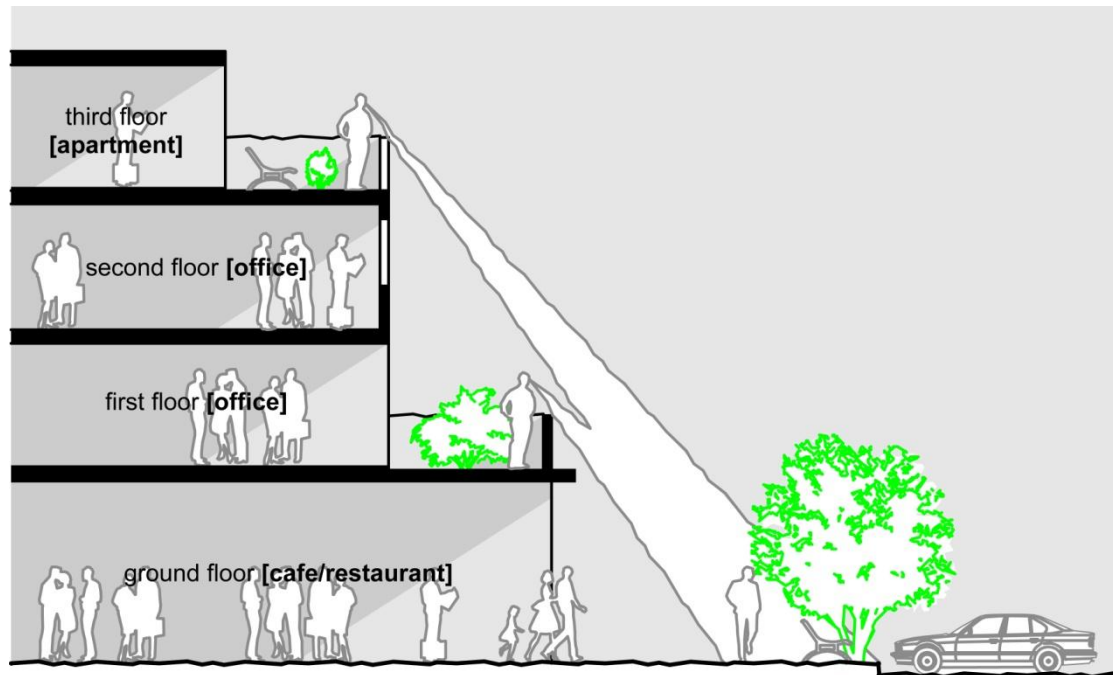


Figure 44: Conceptual section showing stepped terrace, access to natural light and surveillance to street

5.4.2. Fenestration as an Environmental Response

External cladding mechanisms and fenestration are a direct response to the quality of external environment in an urban setting. Noise pollution can be counteracted by double glazing or sound reflective cladding mechanisms which reflect sound from the building façade and contribute positively to levels of stress and mental health. An additional thermal skin operates as a thermal void which decreases thermal bridging to regulate indoor temperatures and increasing comfort levels. Transparency is facilitated through the use of generous glazing although the orientation of a building can minimise this opportunity. Solar fenestration such as vertical or horizontal louvers, semi-transparent shading mechanisms and large overhangs can accommodate the use of excessive glazing.

5.4.3. Variety of Housing Accommodation

The Richmond Co-operative Housing example and the Kelvin Grove Urban Village scheme identify that a variety of accommodation within urban housing is emblematic of the heterogeneous societies that reside in the cities and ignores the incrementality of sprawling cities. Furthermore, the concept avoids segregation through economic, demographic and cultural means by supporting an inclusive society living and interacting together to promote social cohesion.

5.5. Conclusions and Recommendations

The research identifies numerous key concepts and ideas which promote health as a holistic concept and in determining the role of architecture in fostering healthy cities. The advancement of this process looks at a number of conclusions and recommendations for further research and identifies the shortfalls of the process. The ultimate intention is to identify an example within South Africa that portrays the urban health challenges identified in the literature review and looks towards an architectural intervention as a response to these issues. A brief will be formulated to initiate a design project that acts as a supplement to the research.

5.5.1. Outcome of Findings

The research is derived from an understanding of the current challenges of urban communities in maintaining a state good health in the context of intensified urban environments. The consequence to rapid urbanisation is a degradation of the natural and physical environment and a compromising of the social fabric. The concept of a healthy city is explored as a facilitator for health which is understood as the complete physical, mental and social wellbeing of an individual. These attributes of human health relate to culture, biology and lifestyle and affect the body, mind and spirit as defined by the Mandala of Health (Hancock, 1985) and motivate that health problems are embedded in complex features of urban life that fall outside the province for medicine. This motivates the architectural significance of cities in their ability to effect and maintain health. The built environment is defined as the

collection of macro and micro components and the composition of these elements is essentially the collective of a city.

The research has identified urban design mechanisms which look at the compositions of cities and the organisation of land-uses to regulate the proximity of services and amenities and access to green open spaces, natural light and ventilation. Despite the considerable mental health benefits of lower density development, sprawling cities promote segregation and social ills and prioritise the use of the automobile as a preferred mechanism of transport. The intensification of existing low density development and regeneration of the urban central core has promoted accessibility and proximity to the necessary services and amenities. Architecture and urban design make use of concepts such as Smart Growth (Frank, Kavage and Litman, 2005) and mixed-use development to create an urban domain which is integrative and inclusive and incorporates a variety of public and private spaces. These socio-spatial concepts promote interaction and community engagement, maximising opportunities for contacts with people and resources and contribute to social capital which is a critical dimension of social wellbeing (Langille and Lyons, 2000).

Architecture facilitates the way in which the urban environment is perceived and organised in the minds of the community by way of connections, spatial networks, corridors and access ways and promote a legible and coherent domain. An articulation of the built environment can promote a sense of identity and connectedness through cultural associations and the preservation of heritage.

Ultimately, the research looks towards a social architecture that supports not only the biological functions that allow us to survive as individuals but also the aspirational and supportive requirements that allow us to develop to our maximum potential.

5.5.2. Recommendations

The research has developed a number of arguments and identified a series of concepts which define the built urban environment and health and suggest the relationship as one which fulfils the social, emotional and physical needs of the urban population. The definition of these elements as a part of the research process was a conscious attempt to add focus and direction to the research. These topics (the built environment and health) are broad and universal by their very nature and further research should focus on an individual issue such as 'Walkable Cities and Social Health' or 'Legibility and Coherency in sustaining Mental Health' as a development and compliment to the research.

5.5.3. Executive Summary

The role of architecture in fostering healthy cities essentially seeks an urban intervention and the research looked towards uncovering an architectural typology that promoted a social form of architecture to address urban health issues. This information has been utilised to formulate a brief (published in the pending design report) which will look at the Albert Park Precinct in Durban as a context with similar socio-cultural and economic characteristics and health problems as the Hillbrow Health Precinct. The pending design will attempt to utilise the conventional health services and expand on them to interface with inner city regeneration and poverty alleviation. The facility proposes an endorsement of dignity and equity of access. Here, the public should be able to meet in a dignified public space owned by all in order to create a sense of ownership of the facility and provide a facility which all community members have the opportunity to access a broadly equivalent set of opportunities and services.

A significant amount of research and investigation was done prior to the compilation of this document which identified the need for a reworked health and wellness facility within the precinct which would act as a referral facility to the nearby clinics and communicable disease hospitals and address a number of the social issues experienced by the community. Dr. Olowoagba (Head of Communicable Diseases for eThekweni Health Department) has informed the

process and assisted in the direction of the project and research to ensure the relevancy and effectiveness of this research initiative. Furthermore, Rael Harrowitz (Health Planner, ex Johannesburg Development Association) has consulted on the process of comparing the Hillbrow Health Precinct to the Albert Park District in creating a similar architectural typology to the Lefelo la Thlokomelo Wellness Centre as a form of intervention.

The research concludes with the brief which will direct the design of a Health and Wellness Facility in Albert Park. Significant additional technical and contextual research will be compiled in a design report which will be submitted with the final design project.

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Figure 44: AUTHOR. 2010. Conceptual section showing stepped terrace, access to natural light and surveillance to street

Appendices

Appendix A: Interview with Nigel Tarbotton (Metropole Architects)

Question 1: How was the schedule of accommodation formulated?

.....
.....

Question 2: What are the conceptual underpinnings of the building and how does it relate to the context and the purpose of the building?

.....
.....

Question 3: How does the organisation of spaces relate to the legibility and coherency of design?

.....
.....

Question 4: What criteria were used in the choice of site?

.....
.....

Question 5: How does the building relate to the surrounding context in terms of scale and connections?

.....
.....

Question 6: How did you motivate the use of a green open space as a place in which to set a building, given that open space is typically restricted for building purposes?

.....
.....

Question 7: How have the functions of the building informed the floor plan and layout of the spaces?

.....
.....

Appendix B: Interview with Paul and Elizabeth Spooner

Question 1: What are the primary health care concerns of the local community?

.....
.....

Question 2: What questions were asked and how was the information gathered regarding the epidemiological profile of the community?

.....
.....

Question 3: What are the salient social needs and requirements?

.....
.....

Question 4: How does this facility link into the current provision for health care in the area?

.....
.....

Question 5: What are the vocational habits of the local community? Where do they find work and what are their recreational habits?

.....
.....

Question 6: A clinic has been included in the schedule of accommodation; what are the technical services and facilities needed for this clinic? What would the staff component be?

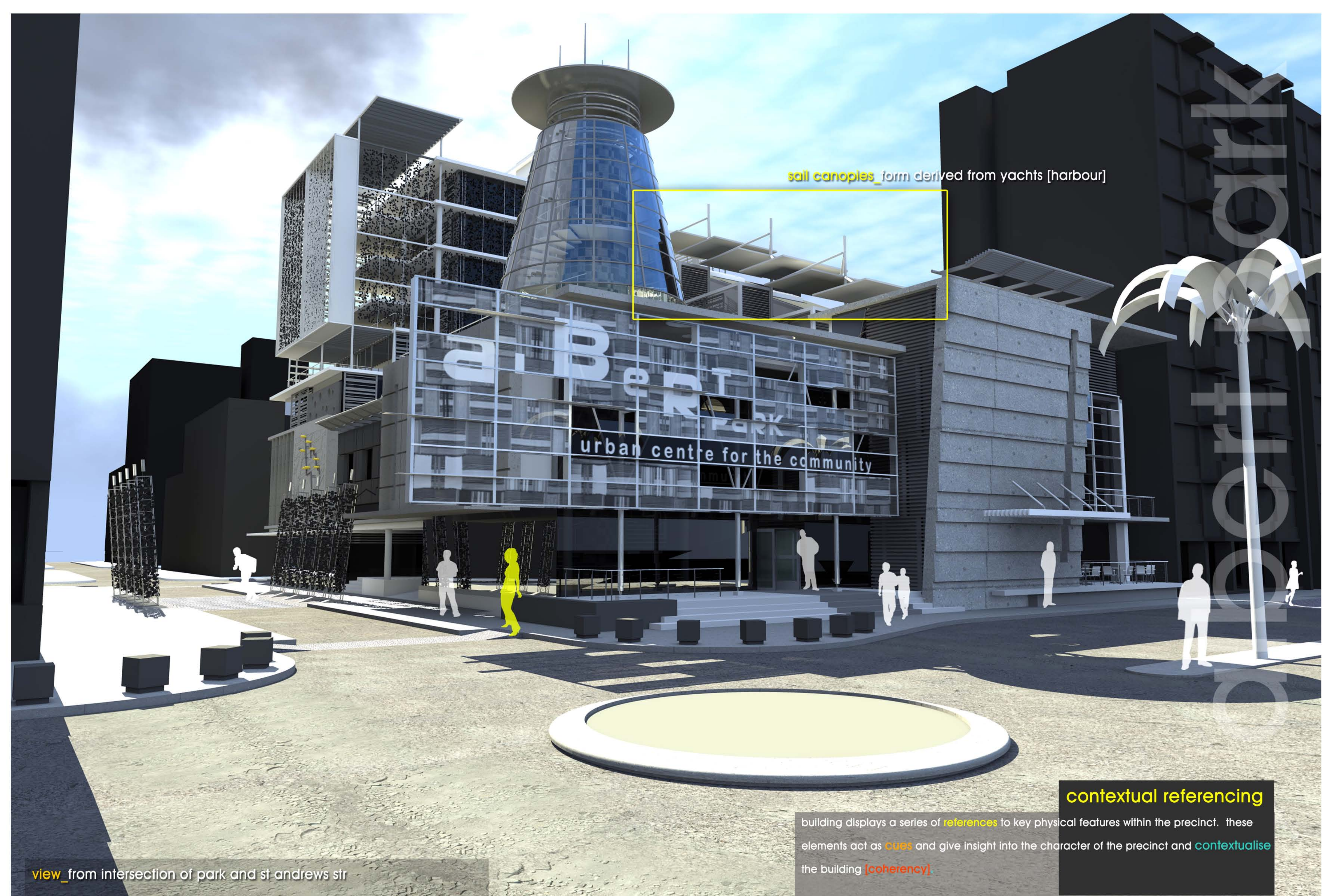
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Question 7: What staff (physicians, psychologists etc.) is needed to run this facility and how would they be accommodated?

.....
.....

Question 8: What additional health promoting programs will be offered to the community and how will the facility accommodate these?

.....
.....

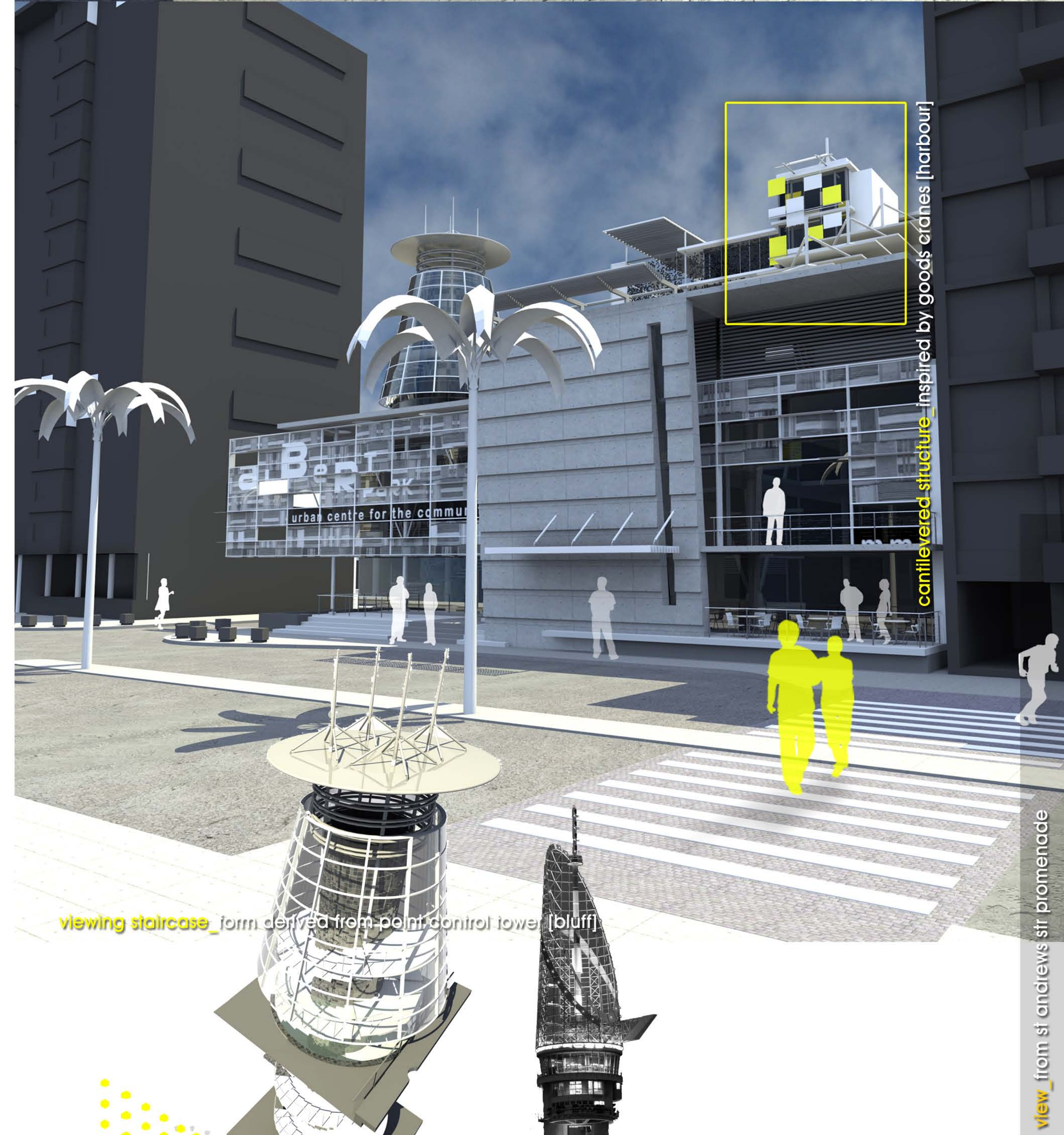


sail canopies_form derived from yachts [harbour]

view_from intersection of park and st andrews str

contextual referencing

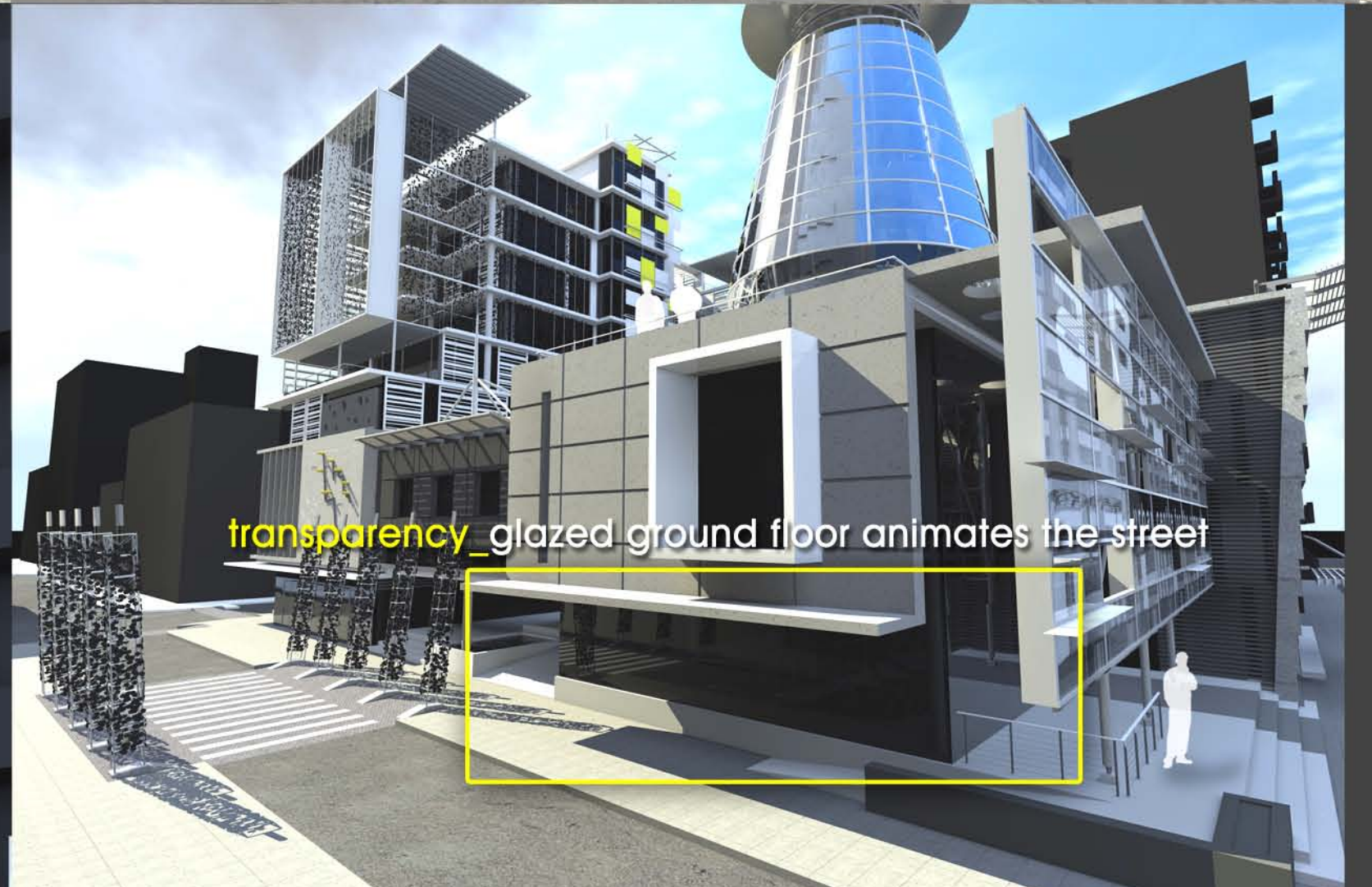
building displays a series of **references** to key physical features within the precinct. these elements act as **cues** and give insight into the character of the precinct and **contextualise** the building (**coherency**).



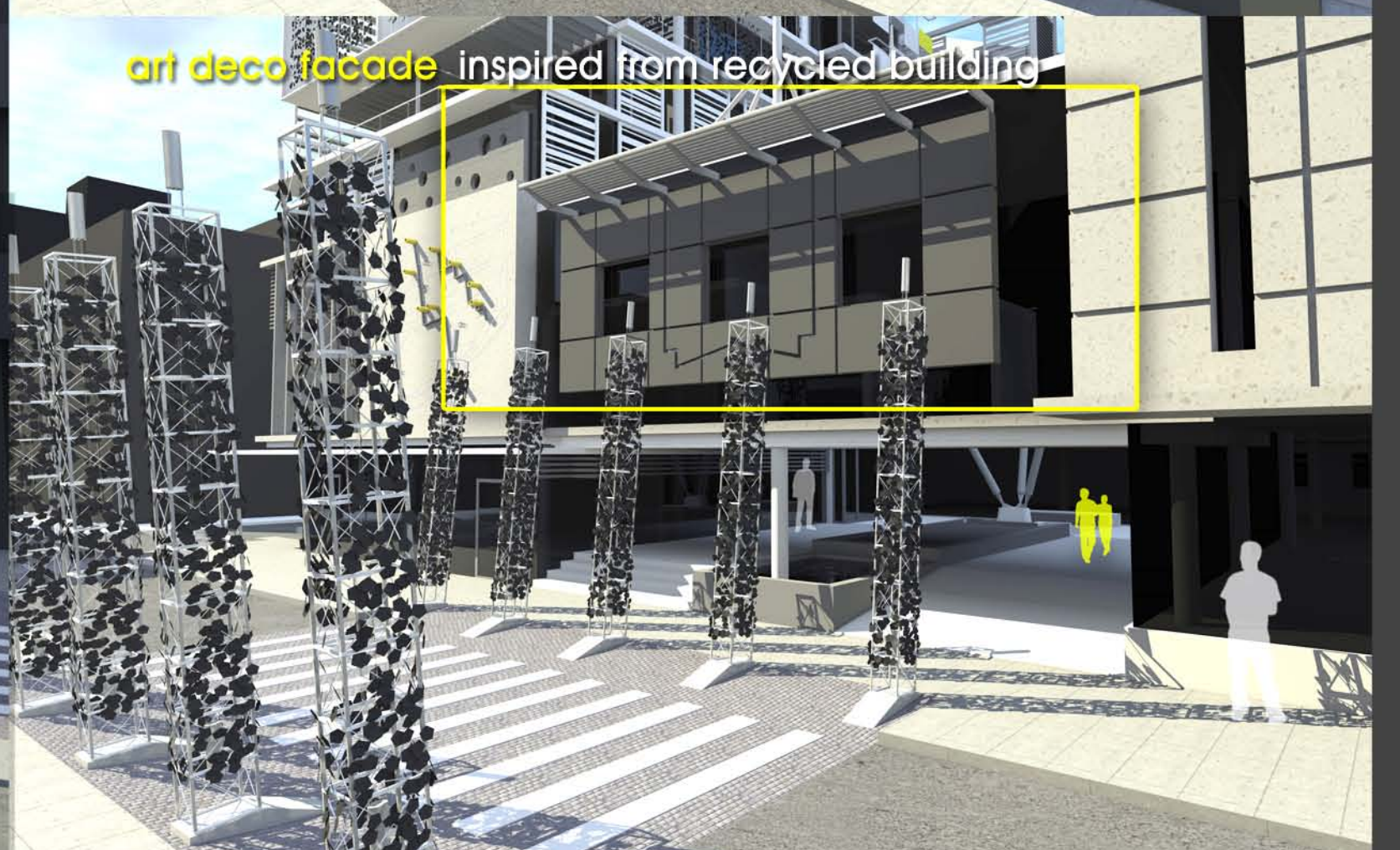
cantilevered structure_inspired by goods cranes [harbour]

viewing staircase_form derived from point control tower [bluff]

view_from st andrews str promenade



transparency_glazed ground floor animates the street

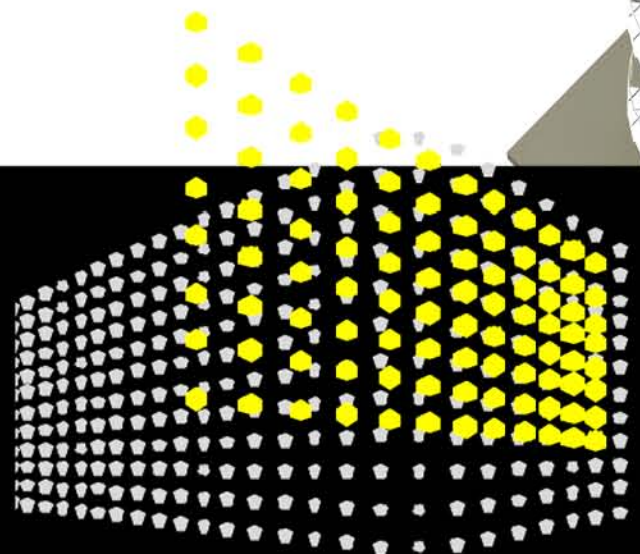


art deco facade_inspired from recycled building



spiral vehicular ramp_form derived for spiral staircase

CONCEPTUAL.PERSPECTIVES



view_from intersection of mac arthur and park str

environmental response

building reduces the concrete footprint by the use of community gardens and raked grow platforms which collect grey water and services the building. vegetation is used as a form of passive solar shading. waste from kitchen is used as compost for community gardens. the building looks at urban permaculture as a form of social space making

light [surveillance]

building uses light as a mechanism for surveillance thru the use of street lighting, lit spaces in the evenings and as markers. reflection of light into spaces announces social spaces, identifies the prominent street intersection and large volumes

transparency

the entire ground floor is retained as glass as much as possible to animate the street and promote a level of transparency which offers an insight into the mechanics and intention of the building to community residents promoting coherency and legibility

a social facility

the building ultimately looks to providing a social facility which provides a range of facilities which are community derived. it is a place for a series of everyday activities, for social, physical and epidemiological health and essentially becomes a piece of urban furniture

view_to urban harbour and first ocean contact for immigrants

urban furniture_building provides public seating (viewing gallery info building)

urban permaculture_vegetation as solar screening

light_reflection onto social spaces

controlled abmain courtyard provides a well surveyed social space

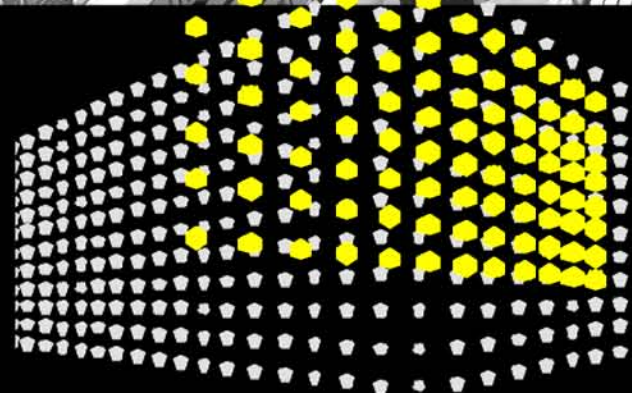
light_a mechanism for surveillance and orientation

viewing staircase_visual link to harbour

view_from north facade looking over gardens

precinct map_way finding throughout the precinct

CONCEPTUAL PERSPECTIVES



Explanation: Many health problems are embedded in complex features of urban life that fall outside the province of medicine especially when considering a contemporary definition of health as a state of **complete mental, physical and social wellbeing and not merely the absence of disease or infirmity** (World Health Organisation, 1985). That is, that health is a holistic term and is regulated and achieved on a number of physical, social and interpersonal levels and not merely through medical

Social Ecological Theory is an overarching framework and set of theoretical principles for understanding the interrelations among the diverse personal and environmental factors in human health and illness (Stokols, 1996:283). It encompasses a number of core assumptions about the dynamics of human health in the promotion of personal and collective wellbeing. It states that the physical environment (geography, architecture and technology) and the social environment (culture, economics and politics) influence the healthfulness of a situation and the wellbeing of its participants.

This model states that an individual's health is a function of the body/mind and spirit integration and wellbeing. The individual exists within a family (which is the immediate social environment) and is affected by four key factors:

exist within the context of our biosphere and culture.

broad overriding concepts



complex land-use patterns

conceptual [interventions]

identified thru the research process

<p>Promotion of healthy lifestyles</p> <p>reduces incidence of diseases on healthy problems, for recovery, for coping with the stress and for improving the quality of life (Longley & Lyons, 2000: 13)</p> <p>physical activity in promoting healthy lifestyles</p> <p>critical intervention to alleviating the burden of obesity and the associated chronic diseases and stimulates the bodies own natural maintenance and repair system (World Health Organisation, 1995:2)</p> <p>Promotion of healthy lifestyles (contemp. def.)</p> <p>def. a way of living based on identifiable patterns of behaviour determined by the interplay between an individuals personal characteristics, social interactions + socio-economic + environmental living conditions (World Health Organisation cited by Longley & Lyons, 2000)</p> <p>Effective Coping + Lifelong Learning</p> <p>help people deal with the challenges + stresses of life without recourse to risk behaviour + involves the personal development of a person</p> <p>Supportive Environment</p> <p>development of a supportive community culture by providing promotive, preventive, curative + rehabilitative care</p> <p>Safety + Security Precautions</p> <p>if the name causes + responses + is linked to personal injury + mental distress such as insecurity + fear</p> <p>Social activity + volunteering</p> <p>is recognition of the social relationships that exist within health + intrude social cohesion + social capital</p> <p>Sense of Purpose, Meaning, Spirituality + hope</p> <p>the concept that one sense of the world + help the individual to place in that environment which is linked to mental + social wellbeing</p> <p>Smart Growth (integrative land-use policy)</p> <p>densification + concentration of land-uses to promote an integrative + accessible urban fabric with strong linkages to amenities, services, heritage + culture to promote a inclusive and heterogeneous societies</p>	<p>physical fitness levels, lower risk behaviour</p> <p>stamina, strength, suppleness, higher levels of circulation, ease of mobility</p> <p>looks at providing safety and security precautions minimising injury</p> <p>limits risk behaviour</p> <p>promotes pedestrianisation promoting physical activity</p> <p>lessens rate of traffic flow, negates the use of the motor car, lessens risk to injuries + vehicular accidents, promotes pedestrianisation</p> <p>reduces incidence of injury through accidents</p> <p>requires sufficient access + design all points, accommodated priority</p> <p>promoting physical activity</p> <p>personal security, sense of community + purpose</p> <p>community cohesion through interaction and social engagement, empowers through education, promotes social capital</p> <p>personal security, sense of community + purpose</p> <p>promotes a rational sense of identity + connectedness facilitated by the coherency + legibility of the building</p> <p>social interaction facilitated by casual interaction</p> <p>social benefits endorsed by levels of transparency</p> <p>promotes a sense of community through social engagement</p> <p>personal security, sense of community + purpose</p>	<p>interaction, social well-being, self-worth, connectedness, social capital</p> <p>promotes social cohesion through interaction, reduces emotional distress, reduces risk behaviour</p> <p>promotes effective coping lifelong learning, social volunteering + creates a sense of purpose, meaning, spirituality and hope</p> <p>promotes a sense of purpose + affirms ones place in the world</p> <p>promotes social wellbeing, social capital through education comm. support + education</p> <p>social cohesion</p> <p>social cohesion + social capital</p> <p>social wellbeing, sense of connectedness + place</p> <p>integrative community endorsing social wellbeing, community connectedness, sense of place + social capital</p> <p>maximising opportunities stimulates interaction promoting social capital thru engagement with local community members</p> <p>personal security, sense of community + purpose, less time spent commuting promoting social interaction + engagement by the use of public transport</p> <p>community cohesion through interaction and social engagement, empowers through education, promotes social capital</p> <p>social interaction facilitated by casual interaction</p> <p>social benefits endorsed by levels of transparency</p> <p>promotes a sense of community through social engagement</p> <p>personal security, sense of community + purpose</p>	<p>reduces incidence of illness, obesity, cancers, infectious disease transmission, stress, depression + low levels of self-esteem</p> <p>reduced heart disease, obesity, injuries and muscle strains, boosts bodies natural immune system, reduced risk to chronic diseases</p> <p>non-communicable diseases: stress, hypertension</p> <p>non-communicable disease benefits from stress, hypertension, anxiety</p> <p>promotes mental wellbeing + limits the affects of stress + anxiety which are affected by issues of security + safety</p> <p>mental wellbeing + a sense of self worth</p> <p>non-communicable diseases linked to the benefits of an active lifestyle + physical activity</p> <p>mental health benefit (anxiety, orientation) attributed to an interpretable + legible urban fabric</p> <p>minimises respiratory complications (asthma) due to environmental + pollutant benefits of fewer vehicles, increased physical activity reduces the incidence of sedentary lifestyles + lessens the chances of obesity, diabetes</p> <p>underground, facilitating linkages within the city</p> <p>non-communicable diseases linked to the benefits of an active lifestyle + physical activity, communicable disease prevention through nutrition, access to natural light + ventilation promoting respiratory health</p> <p>mental wellbeing due to increased safety + security from advanced surveillance, disease prevention gained from nutritional benefits of community garden spaces, respiratory benefits from acces to natural light and ventilation</p> <p>thermal comfort levels alleviating burden of communicable diseases, mental health benefit from reduction in noise pollution</p>
<p>a grid of streets + traffic calming</p> <p>promotes accessibility + creates legible + coherent urban fabric, maximises opportunities and therefore opportunities for interaction, decreasing the speed + intensity of the urban street by the use of changes in surfaces, 2-way traffic flow, speed bumps, planting + increase the number of intersections</p> <p>public transport system + reducing car travel</p> <p>reduces air pollution, increases pedestrianisation, promotes accessibility + walkability, brings community members into contact with one another, promotes social engagement, minimise ground car parking + influences by reducing parking areas from side lights, entrances + public spaces provision of cycle lanes + lanes, protected pedestrian walkways, introducing cycle + bus lanes</p> <p>Urban Permeability</p> <p>promoting health + wellness through domestic gardening as a source of nutrition, dietary education, physical activity + social engagement</p> <p>roof-top gardens diminished thermal heat, regulates thermal heat gain and combats the health burden associated with the heat island effect</p> <p>green open spaces + interstitial spaces</p> <p>direct space for stage, recreation, physical activity + recreation, legible defined by robust structure + formalised boundaries, significant environmental impact + counteracts the Heat Island Effect</p> <p>Transparency</p> <p>creates a powerful civic presence through the mechanism of transparency by revealing the purpose + intention of a space, animates the street + promotes identity</p> <p>Shifted Floor Plate</p> <p>creates a civic scale on the ground floor, offers access to natural light + ventilation, provides place for social, semi-pvt, or community gardening, maximises view to the street to promote surveillance, security + safety, scale offers casual interaction with access by on the street</p> <p>Environmental Response of Building Envelope</p> <p>refers to the building's responding to + direct exposure to environmental conditions, minimises noise pollution, thermal voids regulate ambient temperatures + control levels, promotes transparency</p> <p>human scaled environment</p> <p>not overwhelming in scale + complexity is legible + coherent</p> <p>safe environments</p> <p>buildings overlook streets + public spaces to promote safe, active places, shifted floor plates create semi-private balconies used for surveillance of the street</p>	<p>promotes pedestrianisation promoting physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>minimises risk + danger</p> <p>promotes pedestrianisation promoting physical activity</p> <p>promotes pedestrianisation + physical activity through a walkable urban fabric, reduces the need for motor-vehicles</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p>	<p>integrative community endorsing social wellbeing, community connectedness, sense of place + social capital</p> <p>social cohesion promoted by the interaction + inclusiveness of heterogeneous typologies</p> <p>promotes a sense of community + social connectedness, coherency</p> <p>promotes a sense of community, social connectedness + social capital through associations with culture + heritage</p> <p>promotes social cohesion thru integrative design + social well-being, reduces segregation due to socio-economic and ethnic differences, creates a sense of permanence</p> <p>promotes a sense of community thru community engagement + cultural + heritage associations, social capital + awareness, sense of ownership + social connectedness</p> <p>promotes a sense of community thru community engagement + cultural + heritage associations, social capital + awareness</p> <p>promotes a sense of community through social engagement</p>	<p>non-communicable diseases: stress, hypertension</p> <p>non-communicable disease 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<p>Mixed-use Development</p> <p>the co-location of residential (work, school, home) + non-habitat services (entertainment) + retail with public facilities, a mixture of uses within a particular building or node, supported by densification</p> <p>Heterogeneous Housing Typologies</p> <p>choice + variety of housing types avoids the monotonicity + negative affects of homogenised housing typologies + supports an inclusive + interactive society</p> <p>highly legible urban fabric</p> <p>well articulated, facilitated by strong + coherent linkages, corridors, pathways, visual linking a series of hierarchical destinations</p> <p>walkable urban fabric</p> <p>promotes physical activity, response to local environment in terms of culture + heritage, promotes social interaction</p> <p>mixture of land-uses + building typologies</p> <p>integration of a range of zoning and site uses socially integrative design framework, offers access to culture, leisure, recreation, housing, employment + promotes an integrative architecture which is developed as a collection of sub-cities + different buildings achieved through a diversification in materials, colours, detailing + relates to context, site topography + climate, adaptable building typologies</p> <p>effective public spaces</p> <p>public spaces which are inclusive places of meeting and social gathering which are defined, accessible + interactive + fit within a greater network of public space, must be engaging, interactive + cohesive + provide a place for rational negotiation + cultural awareness (Mammon + Paterson, 2005)</p> <p>public space network</p> <p>used to direct connectivity through a particular precinct and provide green open spaces</p> <p>associations with cultural and historic landmarks</p> <p>facilitated by public open space network, community experience + engaged with the cultural + historic heritage of a place, the use of gateways to announce significant or iconic places within the city</p> <p>corridors + destinations</p> <p>utilised as mechanisms for orientation + accessibility, for engaging with the local context (cultural, heritage) + promotes engagement + interaction</p> <p>making connections</p> <p>dedicated pedestrian links to improve accessibility + connectivity to + from major nodes + relevant facilities + amenities</p>	<p>promotes pedestrianisation promoting physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p> <p>promotes pedestrianisation + physical activity</p>	<p>integrative community endorsing social wellbeing, community connectedness, sense of place + social capital</p> <p>social cohesion promoted by the interaction + inclusiveness of heterogeneous typologies</p> <p>promotes a sense of community + 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i. healthy city.[a definition]

A healthy city or healthy city precinct is one which addresses the physical, epidemiological and social wellbeing of the local community through the organisation and composition of the physical urban environment and provides the essential set of services, amenities and resources which allow the community to fulfil simple daily functions and stimulate personal development. These functions should be achieved without risk or hazard from the local urban environment. A healthy city should promote healthy living, activity and interaction through a coherent, legible, accessible and walkable urban fabric which acknowledges the natural and cultural attributes of the precinct.

ii.analysing albert.park as a health city.[scrutiny.model]

The theoretical Framework and conceptual interventions have been utilised to develop a scrutiny model which will be test the Albert Park precinct as a healthy city precinct based on the definition above.

natural + physical environment

- access to natural light + ventilation
- pollution levels
 - air
 - noise
- traffic
 - speed + intensity
 - number of intersections
 - ability to accommodate cyclists
 - public transport
 - parking
- green open spaces
 - accessibility
 - quality
 - networks + managers
 - provision to local + important networks
- effective public transport system
 - coverage + routes
 - access + intermodal exchanges

social environment

- access to essential amenities + services
 - employment
 - education
 - shopping
 - recreation
 - transport
 - services + public services
- public spaces
 - accession
 - accessibility, security
 - amenities
 - networks + managers
- associations with culture + heritage
- opportunities for casual interaction
 - recreational + programs public spaces
 - public transport
- quality of housing
 - access to private + semi private spaces
 - quality of natural environment
 - efficient provision of housing
 - environmental typologies
 - intended to shelter
- safe environments
 - access to walking
 - building + streets + safety
 - surveillance
- service provision
 - healthcare
 - reliable + nutritious food sources
 - potable water
 - sewage
 - sanitation

urban fabric

- scale + intensity
- transparency
- mixture of land-uses
 - integration of land uses + green open spaces
 - mixed use development
 - linkages between historical + new traditional services
- compact development
- legibility
 - different layers between historical destinations
 - use of navigation, landscaping, lighting, signage
- accessibility + permeability
 - pedestrianisation
 - cyclist lanes
 - available urban fabric
 - opportunities for private activity
 - connections + linkages, exchange water
- public spaces
 - recreative, network + transport
 - accessibility
 - cultural + heritage associations

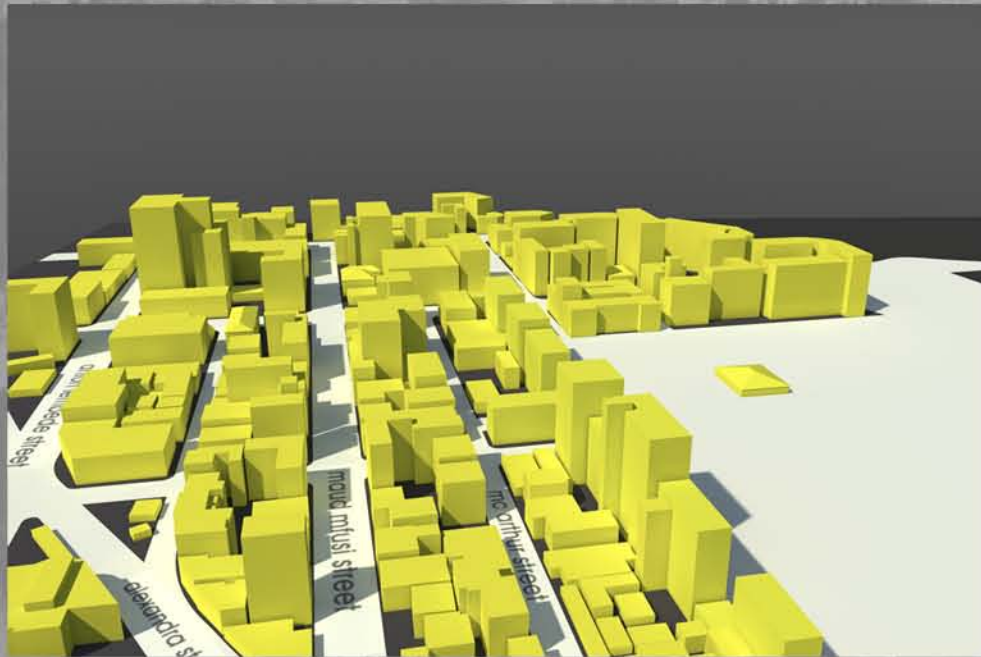
assessment.[criteria]

natural + physical.[environment]

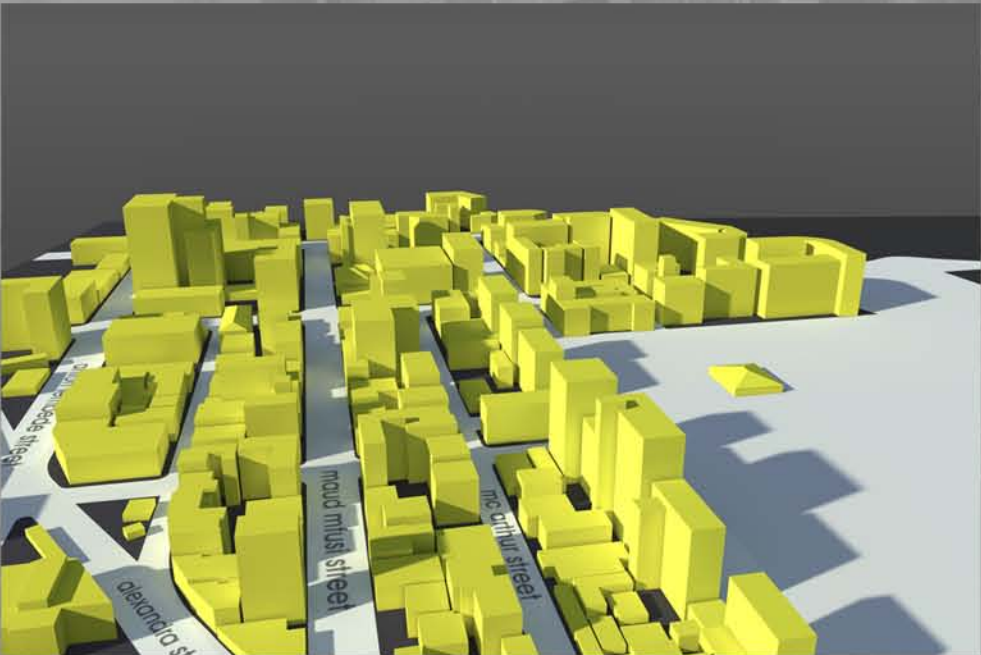
i. access.to.natural.[light + ventilation]

The predominant winds are north-east and south, south-west which leaves the St. Andrew's Street buildings exposed to the elements. Weather from the south is typically a cold front which brings rain, cold temperatures and wind. This edge, in particular lacks the fenestration and pavement overhangs to protect pedestrian from inclement weather conditions. During midday, St. Andrews Street is in full shade during the winter solstice and March and September equinoxes. The street receives a limited amount of sunshine during the summer solstice. The east west streets receive good amounts of natural direct light during summer solstice although are partially shaded during the equinoxes and especially the winter solstice. Despite this, north face of the buildings within the precinct receive continuous direct sunlight (which requires horizontal fenestration) and is a healthy source of natural light and ventilation to the community within this urban precinct. The intensity of the scale decreases from St. Andrews Street towards Lembede Street with the dominantly scaled buildings existing on the northern frontage of each street. The St. Andrews Street flats cast a skyline shadow onto the park which is a horizontal projection of the vertical scale and character of the street. The re-used bowling club is now a satellite Metro Police station and is a single storey unit with now real response to the organisation and character of the surrounding buildings.

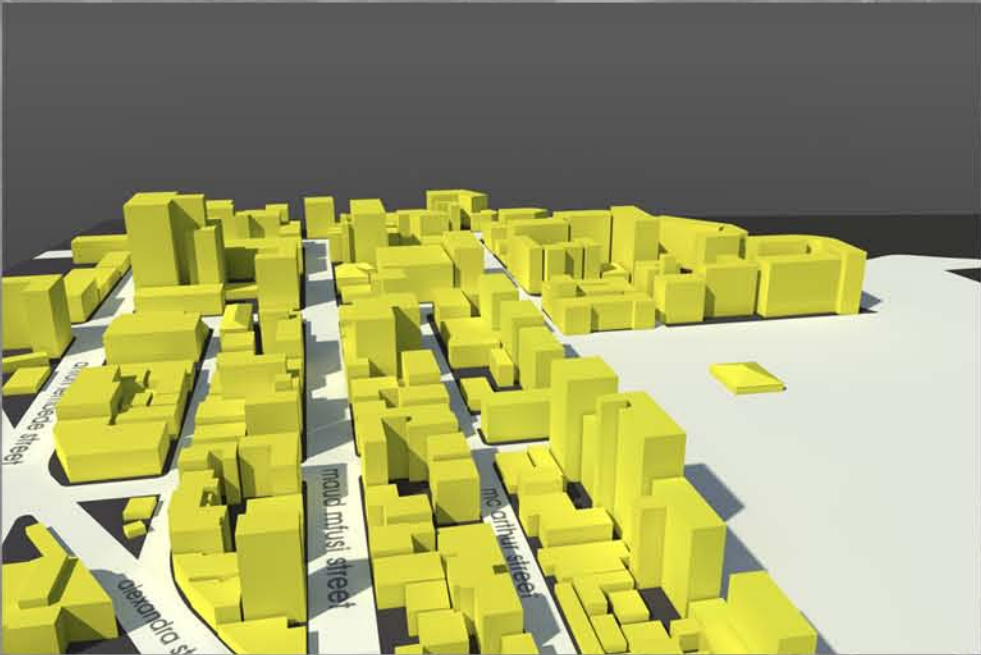
solar[study]



20 March [12:00pm]



21 June [12:00pm]

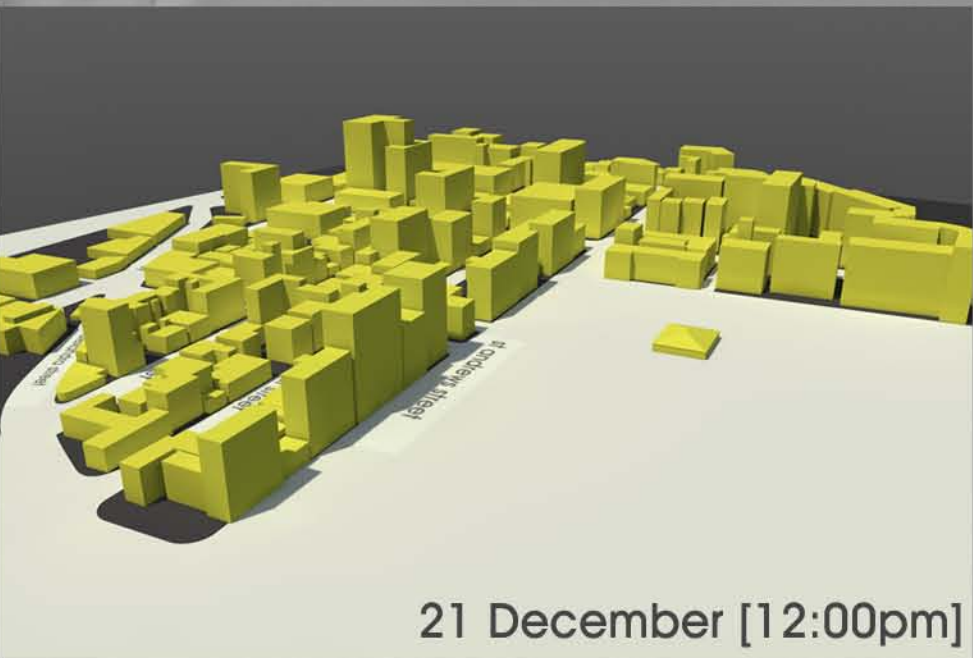
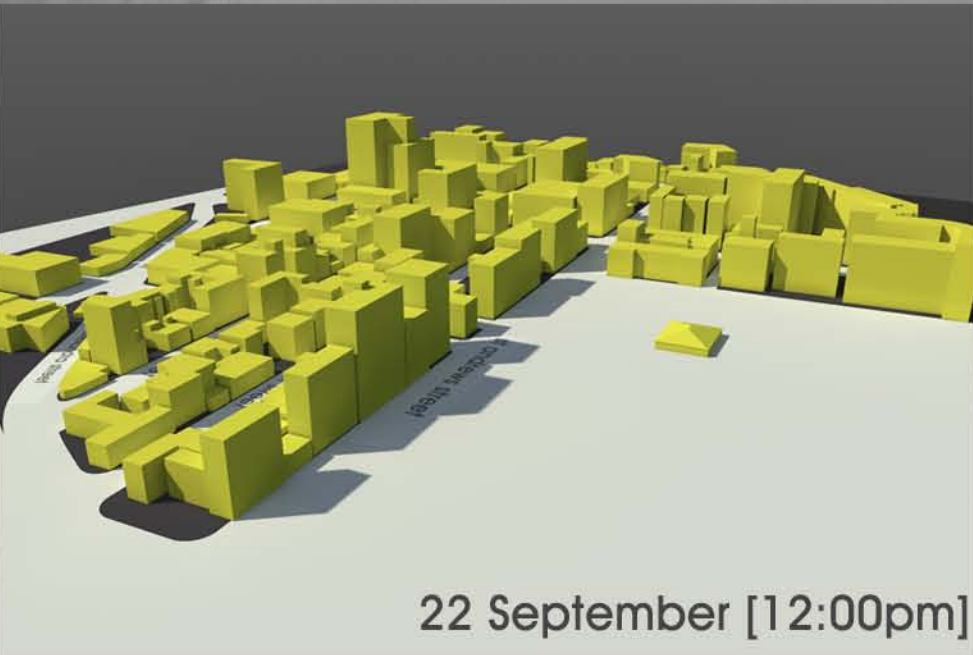
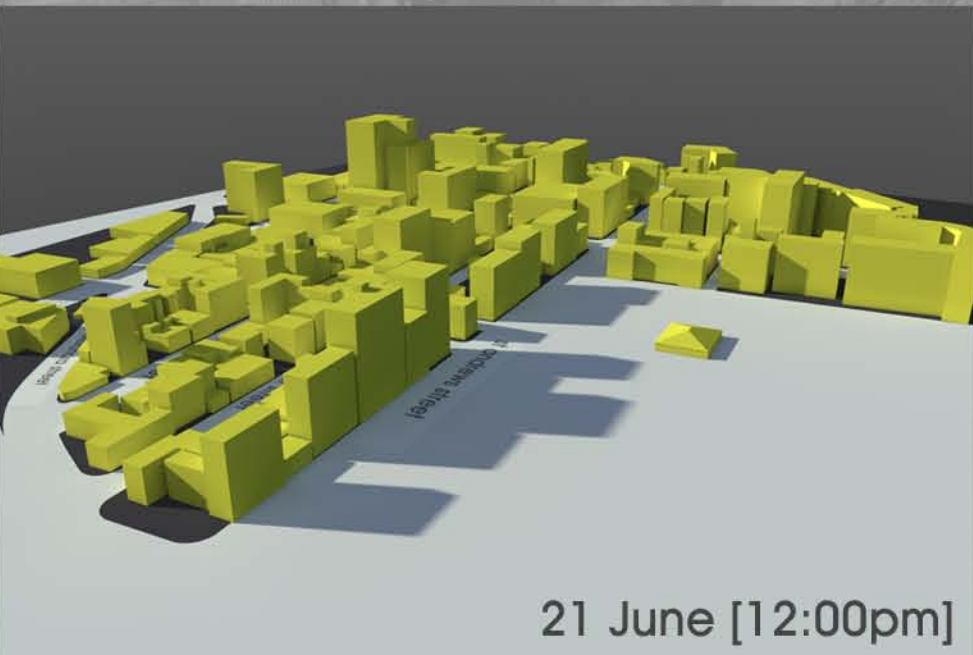


22 September [12:00pm]



21 December [12:00pm]

[view] from west end of mfsui street



[view] from south.west edge of Park

View looking up central void of the courtyard of a building situated between McArthur and St Andrews Street. The upper north and north-west faces of the building receive generous amounts of **sunlight** **during midday** although the ground level of the courtyard is in continuous shadow due to the scale of surrounding buildings. Furthermore, the **south façade** of the adjacent building is in **permanently in shadow**. These under lit areas promote damp which is a significant source of pathogens which cause disease and respiratory complications. Despite this, these cooler spaces can be utilised as a passive form of cooling when ventilated through the surrounding buildings.

View looking down the western end of Maud Mfusi Street towards the southern freeway freeway shows that most of the street is in **shadow** **during the early afternoon (29 March, 2:00pm)**. The surrounding buildings are 3-10 storeys high although during midday, this street is likely to receive more direct sunlight. The north façade of the southerly edge of the street receives good direct sunlight and the presence of trees, along with **orientation** of the streets **promotes natural ventilation**. The southern façade of the northern edge of the street receives no direct sunlight.

View looking from park behind Settlers Museum in Diakonia Avenue. The major scale to the precinct is focussed towards the Victoria Embankment edge with service, access and parking behind. This void is then bordered by another highly scaled edge which sits on the Diakonia and St Andrews streets. This allows **natural and light to penetrate the northern facades** and surface areas of the **internal courtyards**. Furthermore, intermittent spaces and voids exist between the high rise buildings and stimulates natural light and ventilation.

View from Albert Park looking down Park Street shows how the southern façade looking onto the harbour is **continuously in shade** although the late afternoon sun (when aligned with Park Street) pierces the shadow cast onto St Andrews Street. The **north, north west orientation** of the **street grid** allows this **afternoon light** to penetrate the streets. (potential exists to create a square at the intersection between St Andrews and Park Street which will essentially be the only space within the street that receives natural light during the afternoon)

View from YMCA building in St Andrews street looking onto the road adjacent to the park. The solar study demonstrates how this **street is primarily shaded during the day** which is due to the **scale** of the buildings along the street edge. The prevalence of **vegetation** along the street promote **natural ventilation and define the street edge**.



1



2



3



4



5

ii. pollution.levels.[air + noise]

Air **[moderate-high]**

Traditionally, pollution levels in Durban have been high due the high lead content and SO2 levels attributed to the nearby oil refineries in the South Durban Basin area (Nraigu, 1996 cited by Dray, McGill, Muller, Skinner). These levels have dropped by up to 40% due to new legislation (Air Quality Act of 2004) and the implementation of the Durban Multi-point plan which addresses these issues. The eThekwinI Air Quality Monitoring Network Annual Report 2009 (eThekwinI Health Department, 2009) showed that SO2 and NO2 annual mean levels were below the annual limit although Total reduced Sulphur (TRS) odour thresholds were above mean values with a number of spikes which exceeded limits sets out by the SANS 1929 (eThekwinI Health Department, 2009). A pollutant data station situated at the City Hall shows that sulphur levels are lowest in the city although particulate matter (less than 10 microns) is highest in the city.

Noise **[moderate-high]**

The Urban Environment Information Gateway published online (www.cerio.net) states that noise pollution is on the increase as Durban grows more diverse. These levels negatively impact on the quality of life of local residents. The Albert Park precinct is in close proximity to freeways, railway lines, the busy harbour edge and Maydon area although does not see the traffic volumes of the central business district.

Impact: increased levels of annoyance, stress, physiological changes, permanent hearing loss (www.cerio.net/reports/durban/issues/noise/index.htm)

iii. traffic

Speed and Intensity **[low]**

The precinct is a low traffic zone and does not form a high capacity link between two areas within the CBD. The eastern (Dr. Yusuf Dadoo), northern (Anton Lembede Street) and southern (Victoria Embankment) borders of the area are the busiest routes with vehicles accessing and leaving the business district which incorporate most of the drop-off points and bus stops. Taxi's generally use intersections as drop-off points and therefore promotes the taxi as a preferred method of transport. The major taxi and bus drop off is at Park and Anton Lembede as people arrive and leave the precinct from this point. The new Durban People Mover fringes the area and it used to access local attractions and shopping nodes within the greater Durban area. A bus stop exists in St Andrews street adjacent the YMCA which transports students to UKZN and back. The lack of traffic intensity and easy access to various modes of public transport (bus/taxi) encourages the use of bicycles and walking throughout the immediate precinct.

Number of Intersections **[moderate-high]**

The grid-like composition of the precinct is the most efficient mechanism or layout promoting the maximum number of intersections (Smart Growth Principle). These intersections slow down traffic and act as additional meeting spaces for pedestrians. The block sizes are large and rectangular which inhibits the potential to create further intersections. The research should look at compartmentalisation to break up the generous block sizes and develop a finer grain which will:

- further slow down traffic
- create further intersections for casual meeting spaces
- Promote accessibility and permeability
- Develop more building facades promoting access to natural light and ventilation

The figure ground shows pedestrian movements relative to the intersections. The major pedestrian movements are:

[Park Street]: People accessing public transport in order to move throughout the CBD. Numerous shops, services, taverns and stalls along the street. The Park Street route extends to a route which runs through the Albert Park and leads to Wilsons Wharf which is a preferred entertainment node to the local residents and students.

[Anton Lembede]: Major route out of the city lined with a number of shops, businesses, educational facilities, day care, doctors rooms etc. the is a major activity street which fringes the precinct and forms the northern boarder. It is a major edge which draws residents from the southern end (St. Andrews street) of the area through the precinct.

[Moud Mfusi Street]: The busiest shopping and entertainment street within the precinct and forms a major link to and from Daddoo Street.

[St Andrews Street]: Busiest residential street with views to the harbour and Albert Park. Draws people from Lembede Street to the southern part of the precinct.

[Lalor's Passage]: pedestrian corridor with access to residential and social housing developments and links Diakonia Av. to Mfusi Street.



Parking **[high]**

All of the streets within the precinct accommodate either parallel or diagonal parking bays. A number of the residential flats have ground floor parking off the street. Parked cars form a physical barrier between the street and the pedestrians on the pavement. Mfusi and St Andrews street are lined with trees.

iv. Green Open Spaces

Proportion to hard impervious surfaces **[high/amicable]**

Albert Park is a large green area within the precinct and therefore the green open space ratio relatively equal. Furthermore, the green fringe to the harbour edge is a green barrier between the waterfront and CBD. The design looks to promote urban permaculture as an intervention which would decrease the amount of hard impervious surfaces, promote urban agriculture, provide a nutritional a food source and offer social spaces for interaction, education and community engagement. (Preventative, curative and rehabilitative care)

Accessibility and linkages **[moderate]**

Significantly, Park Street is a major passage which links the vacant site on Lembede street to the Albert Park itself. Furthermore, the park becomes a link to the Victoria Embankment and shopping and entertainment node (Wilson's Wharf). An under-utilised park behind the settlers museum is a self contained area and can be utilised to from continue the link between Mfusi Street, Lelloo's Passage, Esplanade Avenue and the Victoria Embankment.

Security **[high]**

The inclusion of a satellite police station has increased the general security of the precinct through surveillance, monitoring and general presence. A small satellite booth sits on the south western border of the site.

social.[environment]

i. access to essential amenities and services

employment **[high/amicable]**

The precinct is well positioned to the Durban CBD (access to business and commerce, service and maintenance, shop assistants, small business enterprises etc.), Maydon Wharf (logistics, light industrial, ship chandling and container yard work), the Bulwer, Berea and Glenwood Suburbs (small business enterprises, light industrial) and the Warwick Junction/ Greyville precinct which is a busy inner city transport and shopping hub. Despite these opportunities, job shortages occur in the unskilled labour sector and a number of social programmes exist which promote employment and skills development within the Albert Park precinct (YMCA, Diakona Centre etc.)

shopping amenities **[high/amicable]**

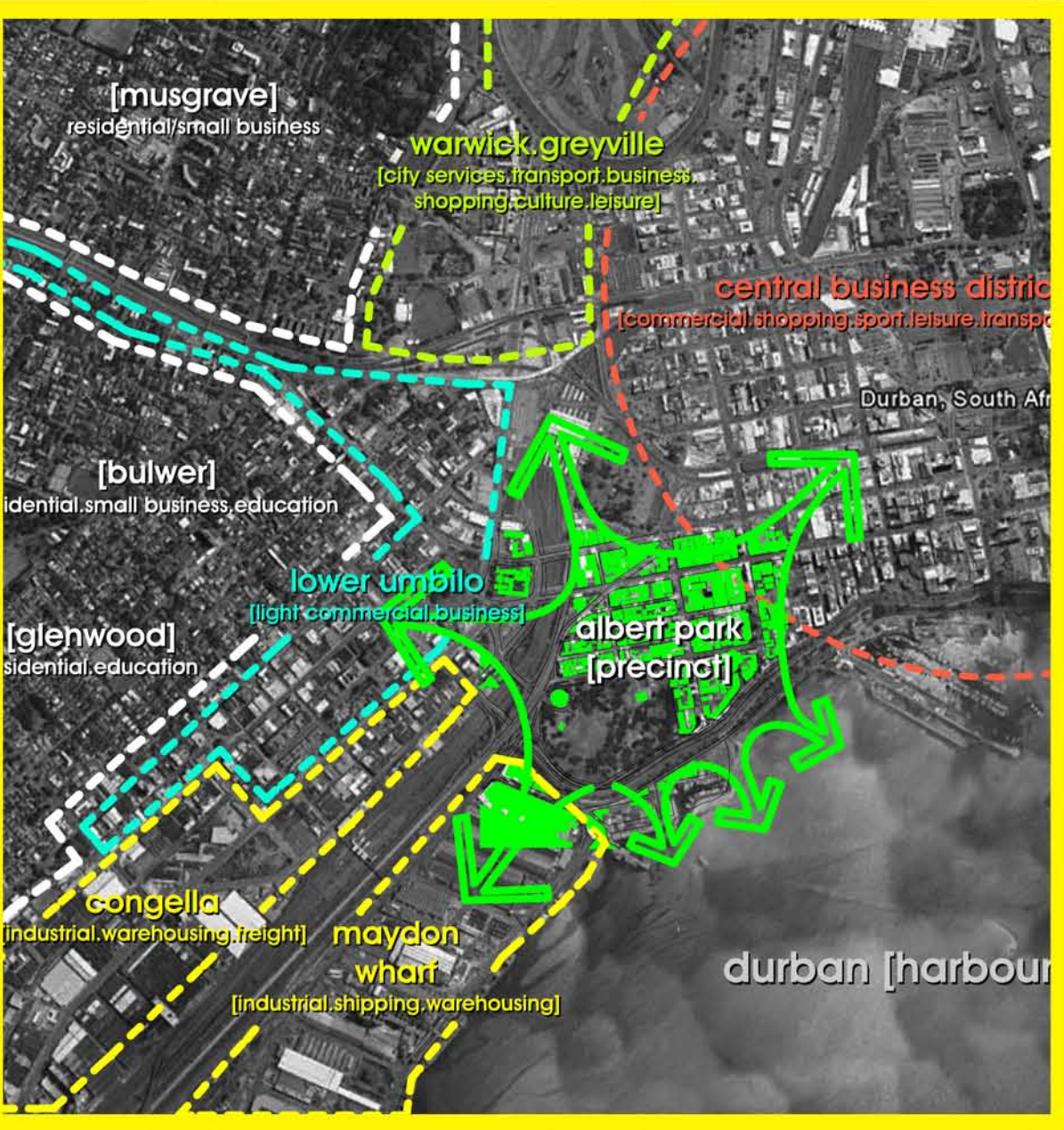
The immediate precinct accommodates numerous spaza shops, butcheries, taverns, hairdressers, bakeries, cellular stalls etc. which are concentrated along Mfusi, Park and Lembede Streets. A significant shopping and entertainment node exists at Wilsons Wharf. Furthermore, the Early Morning and English Markets are within 1-2km and the CBD offers sufficient amenities to the local residents.

education **[high/amicable]**

A significant educational node exists at the intersection of Lembede and Park Street. The Durban Institute of Technology (City Campus) is within 500mm of the precinct and the YMCA is a UKZN hostel with a bus service running to and from the Howard College Campus on the ridge. A music school sits adjacent the Diakonia Centre and Settlers Museum and forms a secondary node which incorporates social services, a church and a museum along a through way (Esplanade Avenue) to Victoria Embankment.

recreation **[poor]**

The Albert Park itself is the only usable green open space and accommodates soccer matches during the day. A playground (kept under lock and key) and netball/basketball courts exist in a derelict state and are under utilised. The YMCA has a multi-purpose hall which it uses for aerobics classes during the week for the local community. The Park operates insufficiently as a space for recreation due to lack of upkeep and the limited facilities and the green edge to the harbour is an alternative option and is well utilised for relaxation and sporting activities.



A range of social services and facilities are provided by local organisations, churches and NGO's within the precinct which are community orientated and aid in uplifting and empowering the community; these include:

- | | | | |
|-------------------|------------------------|----------------------|---------------------|
| - Lobby groups | - life skills programs | - juvenile justice | - gymnasiums |
| - sport clubs | - teen, youth clubs | - drama, music | - dance |
| - poetry | - Leadership prog. | - computer centres | - business seminars |
| - volunteering | - stress + trauma | - icebreaker courses | - literacy groups |
| - resource centre | | | |

ii. public Spaces [low/under-utilised]

The key public spaces within the precinct are the park (corner of Lembede and Park), the Albert Park itself and the green edge to the harbour. The key under-utilised public space within the precinct is the green space behind the settlers museum which is self-contained, well defined and could potentially be linked directly to Esplanade Avenue. The presence of the satellite metro police station has increased the security within these public spaces although the community are reluctant to be in these areas at night as the are not sufficiently lit. The Park is very accessibly and well defined by the free lined St Andrews Street (north), tall residential flats (east) and Victoria Embankment (south). The park is not seen as a successful and interactive space due to the lack of purpose and function, ill maintenance and the lingering perceived security risks. The green open spaces do form a network which extends from Victoria Embankment, through Albert Park, along Park Street to the square (Lembede and Park) towards the vacant site between Lembede and Kaseme Street, across the southern freeway intersection and towards the green open space the taxi rank. A second link exists between Victoria Embankment, Esplanade Avenue, the settlers museum open space, Lelloo's passage and a Cape Dutch building in Nadull Street.

iii. culture and heritage buildings [average]

There are numerous heritage buildings and a museum (art deco, tudor, Victorian, verandah typology, cape dutch) located within the precinct which add a significant quality and identity to the precinct. Many of these buildings are ill-maintained, or site behind fences or overgrown street vegetation are not treated as significant or linked to any utilised circulation route and public open space.

iv. opportunities for casual interaction

corridors, passages, public spaces [average, good]

Park street, Lelloo's passage, Esplanade Avenue, Mfusi and St Andrews street are the prevalling corridors and passages and from critical intersections, interactive nodes and throughways which have not successfully been articulated to exploit the benefits of pedestrian movements, permeability and walkability.

public transport [good, excellent]

The preferred use of public transport and the level of accessibility within and around the precinct is a significant contributor to the social wellbeing of the local community through casual interaction and engagement. The motor vehicle is reserved for young professionals, middle class families and pensioners within the area. Taxi ranks, bus stops, train stations exist within the nearby surrounding area and the use of a motor vehicle is almost negated.

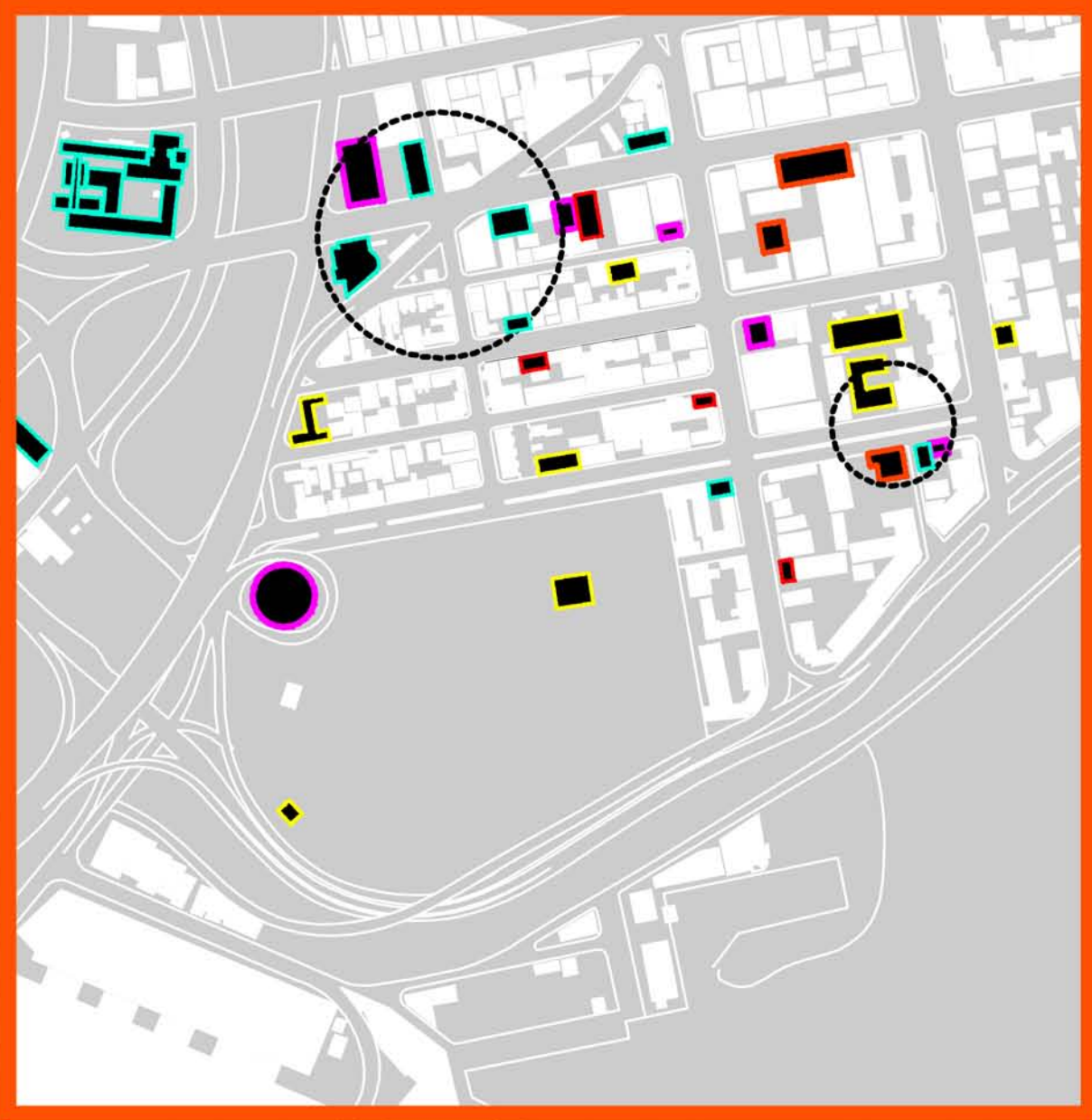
v. quality of housing

access to private and semi private spaces [average]

Due to the scale of the flats and residential blocks, the majority have small outdoor balcony spaces which look directly onto the street. This exists even at ground floor level and sits right on the pavement edge. The political and socio-economic climate has undermined the notion of this idea and reduced it to a security risk. A few of the blocks have internal courtyards and communal facilities such as halls and eating/dining facilities this idea has not comprehensively been explored or implemented in the area.

heterogeneous housing typologies [average]

A few buildings have been explored and notably included only dormitory living with communal spaces between



them although SOHO (a social housing development organisation) has redeveloped a high rise set of apartments adjacent the Diakonia Centre and accessible by Lelloo's passage. The typologies include one and two bedroom units as well as units designed specifically for young, single mothers who share sleeping and living spaces with separate rooms for their young children. This is seen as an inclusive and integrative mechanism which allows community members and families of different ages, social classes and financial situations to live together and reduces stratification.

linkages to amenities [good/amicable]

Many of these flats and residential blocks are accommodate ground floor retail facilities. Interestingly, a number of buildings incorporate additional facilities within the buildings under sceptical circumstances. An example is the reuse of sectional title flats for church groups, clinics and crèches (seen in the Hillbrow Health Precinct Case Study) .Nevertheless, previous chapters have identified the generous availability of amenities within the precinct.

vi. service provision

healthcare [good]

a number of primary health care facilities exist within the immediate precinct and include:

- | | | |
|--|---|--------------------------------|
| - durban city hospital | - lancers road clinic | - lancet clinic hospital |
| - communicable disease centre | - st. albens hospital | - private doctors/consult |
| - durban chest clinic | - prevention to mother and child clinic | - albert park satellite clinic |
| - shadows of help community health care clinic | | |

Access to Primary health care within the immediate and nearby precinct are amicable and cover the 3 levels of primary health care provision i) level 1: clinics; level 2: community health centres; level 3: hospitals and specialist centres as well as general consultancy rooms. Interviews with Rael Harrowitz and Dr. Olowlagba have identified the need for more consultancy rooms and rudimentary health care provision which should act as a consultancy facility which will refer immediate community members to the nearby applicable centre.

These services have been identified:

- | | | |
|--|---|-------------------------|
| - Basic and rudimentary primary health care services | | |
| o Minor ailment treatment | o HIV/AIDS screening, testing, counseling | o Immunisations |
| o Traditional medicine (herbalist) | o NGO's | o Psychologist |
| o Pharmacy and dispensary | o General medication | o ARV and TB treatments |
| o General consultancy facility with waiting areas | | |

Reliable and nutritional food sources [good]

The early morning market and English market exist within walking distance from the precinct (< 1, 5km) and a number of fresh produce grocers operate within the precinct. Furthermore, a Spar and a number of other larger supermarkets are within a 5km radius. The opportunity exists to introduce urban permaculture on roof tops, balconies and window ledges to provide a small and sustainable source of nutritious fruit and vegetable will be explored.

Potable water, sewage, sanitation [average/good]

A number of services have been compromised due to the lack of maintenance, low rent payments and the practises of unscrupulous landlords who charged exorbitant rates and levies. The strain on the service network has been addressed and continues to improve as new investment and municipal intervention increase in the area (Mohamed, 1999). The slum-like living standards of the past 15 years is seemingly in the past and a new interest and optimism exists within the area... and with it the associated improvement in service provision and maintenance.





i. scale and intensity [good]

The precinct is an urban zone with low to medium rise buildings which are primarily residential apartments and flats. The largest buildings face onto the park and directly onto Victoria Embankment to maximise on views of the harbour and accept the cool harbour breezes although restrict access and views of the harbour to the rest of the precinct. The general scale within the precinct is restricted to 10 storeys with a few high rise developments (The Renaissance- social housing) which tower over the area. The staggered scale contributes to generous access to natural light and ventilation. The buildings generally sit on the street edge and accommodate ground floor retail and commercial uses which serves to animate the street. The rigid grid-like composition of the street layout serves to channel and contain pedestrian flows and traffic and has been designed more for the motor vehicle rather than the pedestrian. Therefore, the precinct lacks the socio-spatial qualities relative to the human scale.

ii. transparency [low]

Despite accommodating a number of ground floor retail and commercial activities, the residential nature of the precinct restricts access to individual buildings based on tenancing in order to maintain levels of security. The general shop front façade includes an entrance and generous advertising and gives little indication or insight into the character of the internal environment within these stores.

iii. mixture of land-uses [medium/high]

Integration of land-uses and green open (public) spaces

The intense residential zones which surrounds the park dominates the precinct in terms of scale and purpose. This residential composition runs throughout the precinct although develops into a multi-purpose or mixed-use zone as the precinct moves towards Lembede Street which moves traffic out of the city. Interspersed between these residential zones is a collection of commercial, semi-residential and heritage or religious buildings. The western edge accommodates a number of commercial buildings (re-used garages) which service the taxi rank which sits below the M\$ freeway. The prominent Mfusi and Park Streets are lined by residential buildings with ground floor retail and commercial activities and service the dense flow of pedestrians and provide services and amenities to the local community. The precinct itself is fringed by an intensification of commercial and retail facilities which is the beginning of the CBD. An educational zones exists at the intersection of Lembede and Park Street. Beyond the M4 freeway and railway are a number of educational and commercial buildings with a transportation depo/rank which is void of any residential accommodation. These areas service the Congella and lower Umbilo light industrial areas.

- residential.accommodation
- residential.with.ground.floor.commercial/retail]
- commercial.warehousing.parkade
- religious + heritage
- education.learning.schools
- transportation.depo.rank
- public.green.open.space

iv. legibility

coherent linkages between hierarchical destinations [low/medium]

Due to the residential nature of the precinct, the significant or nodal buildings within the precinct all interspersed although easily identifiable as they are of a different scale and character. Despite this, there is a lack of focus and strategic development around these buildings which will be explored in the urban design proposal. These buildings generally line the street and are connected via the street network although Lelloos Passage is seen as a the only pedestrian corridor within the area which links a few of these buildings.

use of fenestration, landscaping, lighting and signage [low/medium]

The area is orientated around the park, which is easily identifiable due to its scale. The buildings have limited amounts of fenestration over balconies and on building frontages. Significantly though, most of the ground floor pavements which are lined with commercial and retail facilities are covered with awnings that cantilever off the first floor above. The area utilises street lighting to illuminate the streets during the evening.

opportunities for physical activity [medium/high]

The park is the major space for recreation and physical activity although is under-utilised due to lack of facilities and the lingering security issues (despite the police presence). The largely public transport based/ pedestrian community walk throughout the precinct to access services, amenities and transport and this is seen as an opportunity to interact and engage with members of the community and participate in light physical activity. A number of the buildings have multi-purpose spaces (halls) which are used as aerobics and exercise spaces.

v. effective public spaces [low]

The dominant public spaces within the precinct are the park, the square at the intersection of Park and Lembede Street, Lelloos passage. The spaces are well defined on plan due to the scale of the area although are unsuccessful in the services and activities that they offer and are under designed with a lack of street furniture, coverings, artwork and colours. The public open space network which is the link between the open/public spaces is under developed and disconnected by a lack of pedestrian walkways, effectively designed corridors and orientation devices. The urban design solution looks to develop this link further and promote a permeable urban fabric which looks to promote physical and social wellbeing through physical activity, cultural association, public engagement and interaction.

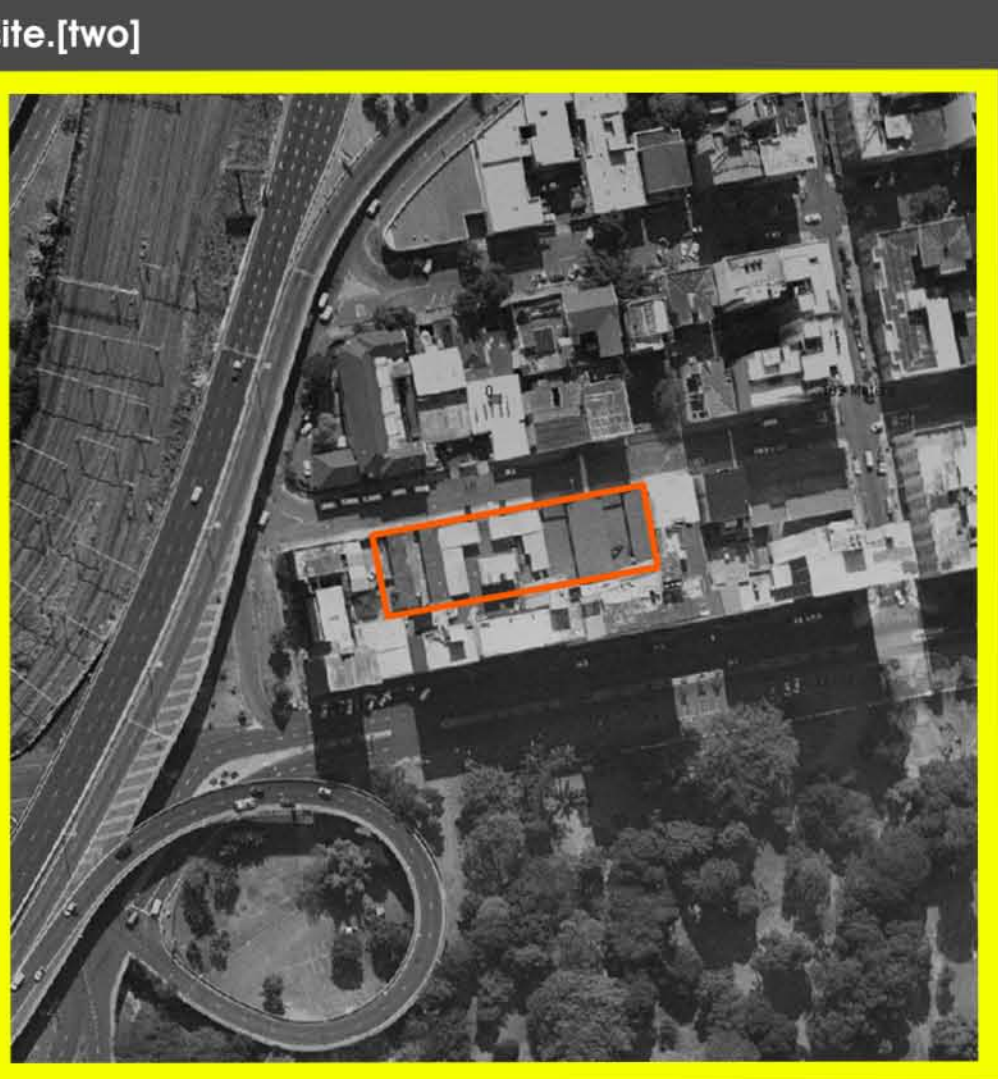
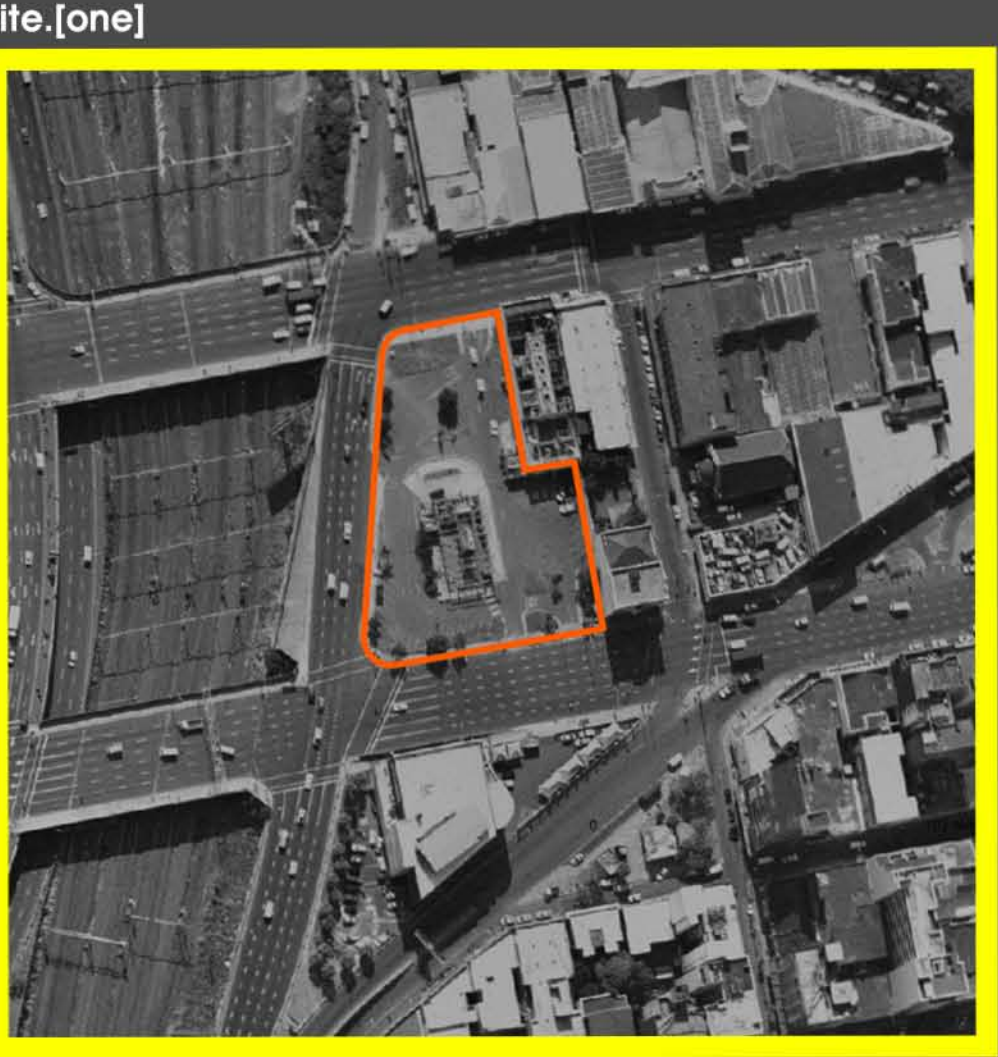


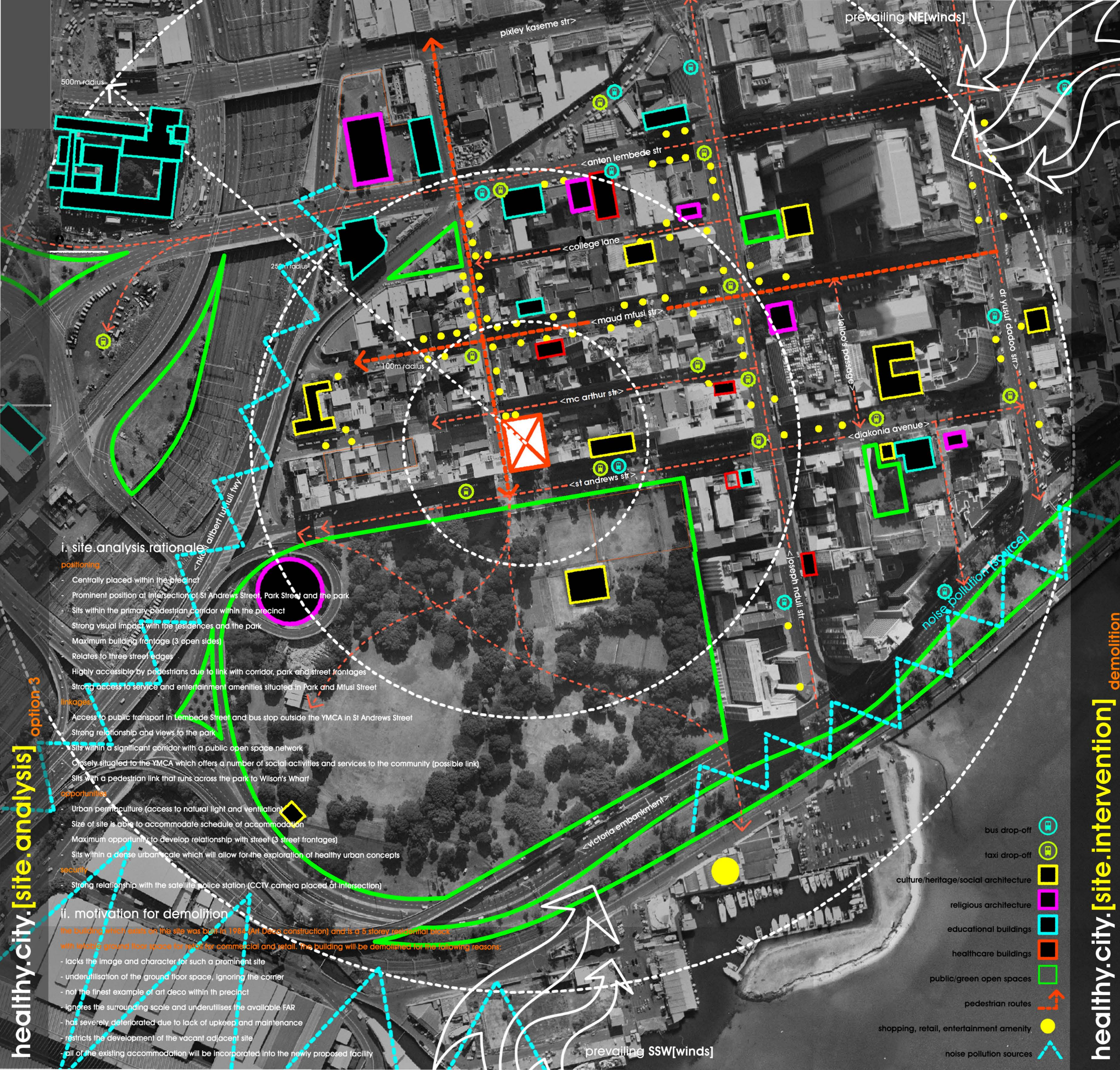
criteria				
linkages	public transport			✓
	harbour views	✓		
	public or green open space network		✓	
	movement corridors, passageways			✓
	nodes, intersections			✓
opportunities	heritage + cultural buildings	✓		
	impact (visual)			✓
	urban permaculture			✓
access	facilitate schedule of accommodation		✓	
	develop relationship with street		✓	
	exhibit necessary urban scale		✓	
	pedestrians	✓		
	cyclists	✓		
access	public transport			✓
	natural light + ventilation			✓
	services			✓
	social and recreational amenities		✓	
		poor	fair	good

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	natural light + ventilation			✓
	services		✓	
	social and recreational amenities			✓





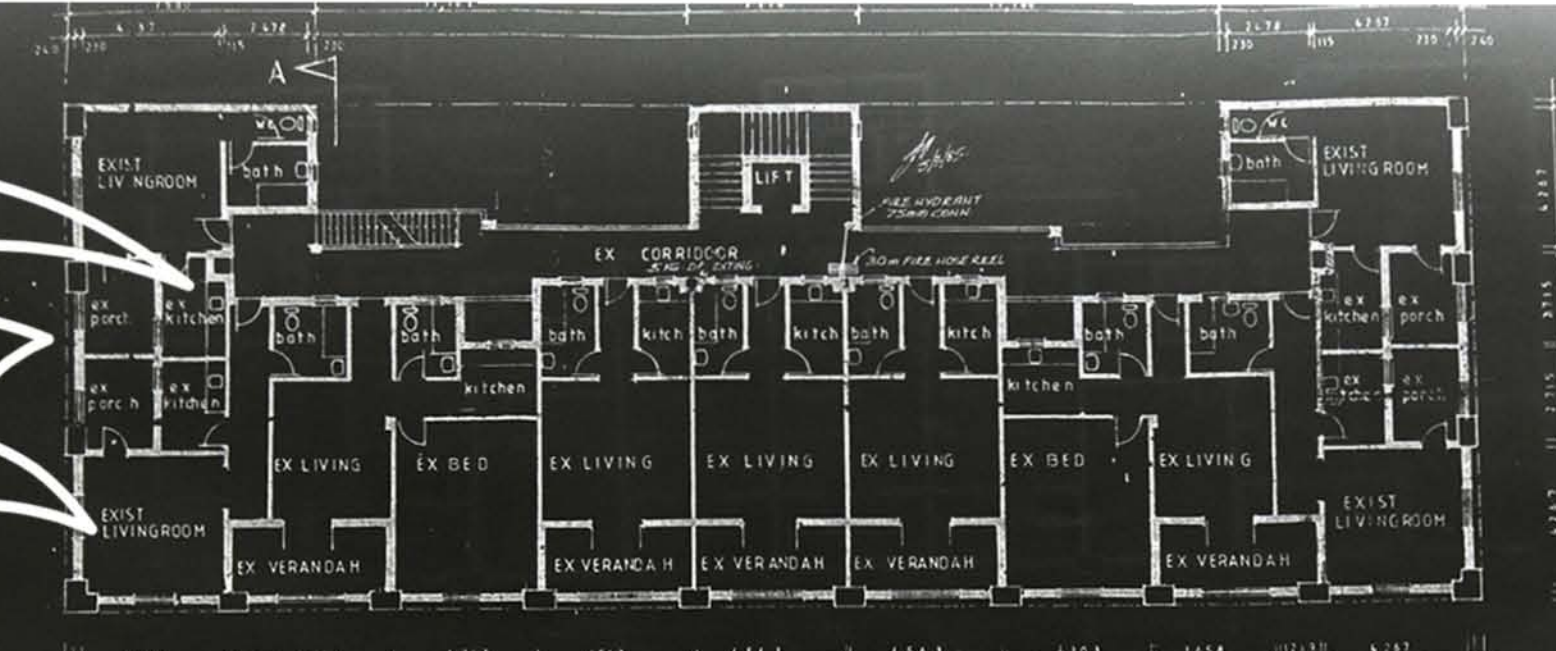
i. site analysis rationale

- positioning**
 - Centrally placed within the precinct
 - Prominent position at intersection of St Andrews Street, Park Street and the park
 - Sits within the primary pedestrian corridor within the precinct
 - Strong visual impact with the residences and the park
 - Maximum building frontage (3 open sides)
 - Relates to three street edges
 - Highly accessible by pedestrians due to link with corridor, park and street frontages
 - Strong access to service and entertainment amenities situated in Park and Mtusi Street
- linkages**
 - Access to public transport in Lembede Street and bus stop outside the YMCA in St Andrews Street
 - Strong relationship and views to the park
 - Sits within a significant corridor with a public open space network
 - Closely situated to the YMCA which offers a number of social activities and services to the community (possible link)
 - Sits with a pedestrian link that runs across the park to Wilson's Wharf
- opportunities**
 - Urban permeability (access to natural light and ventilation)
 - Size of site is able to accommodate schedule of accommodation
 - Maximum opportunity to develop relationship with street (3 street frontages)
 - Sits within a dense urban scale which will allow for the exploration of healthy urban concepts
- security**
 - Strong relationship with the satellite police station (CCTV camera placed at intersection)

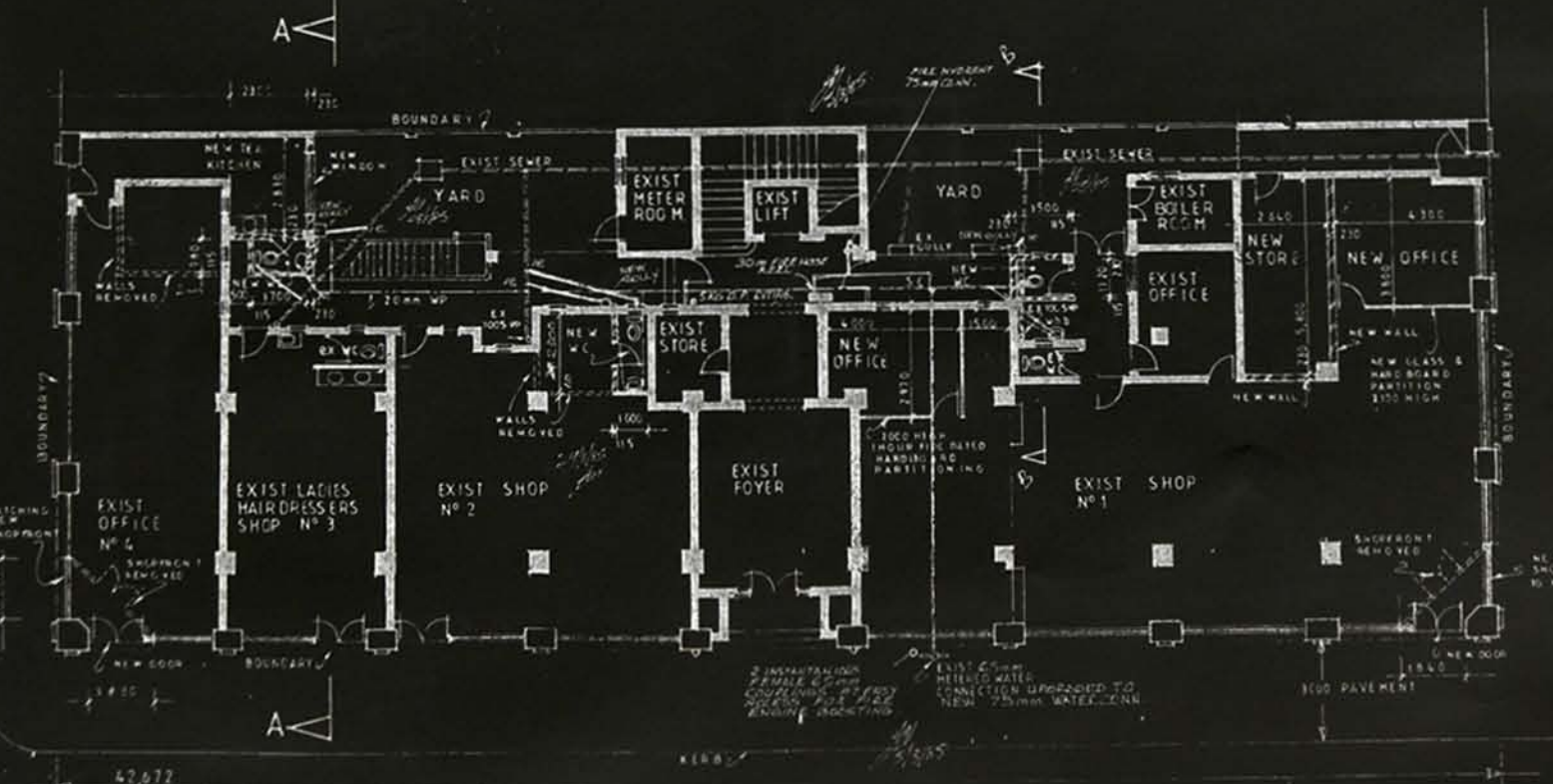
ii. motivation for demolition

- the building which exists on the site was built in 1984 (Art Deco construction) and is a 5 storey residential block with limited ground floor space for retail for commercial and retail. The building will be demolished for the following reasons:
- lacks the image and character for such a prominent site
 - underutilisation of the ground floor space, ignoring the corner
 - not the finest example of art deco within the precinct
 - ignores the surrounding scale and underutilises the available FAR
 - has severely deteriorated due to lack of upkeep and maintenance
 - restricts the development of the vacant adjacent site
 - all of the existing accommodation will be incorporated into the newly proposed facility

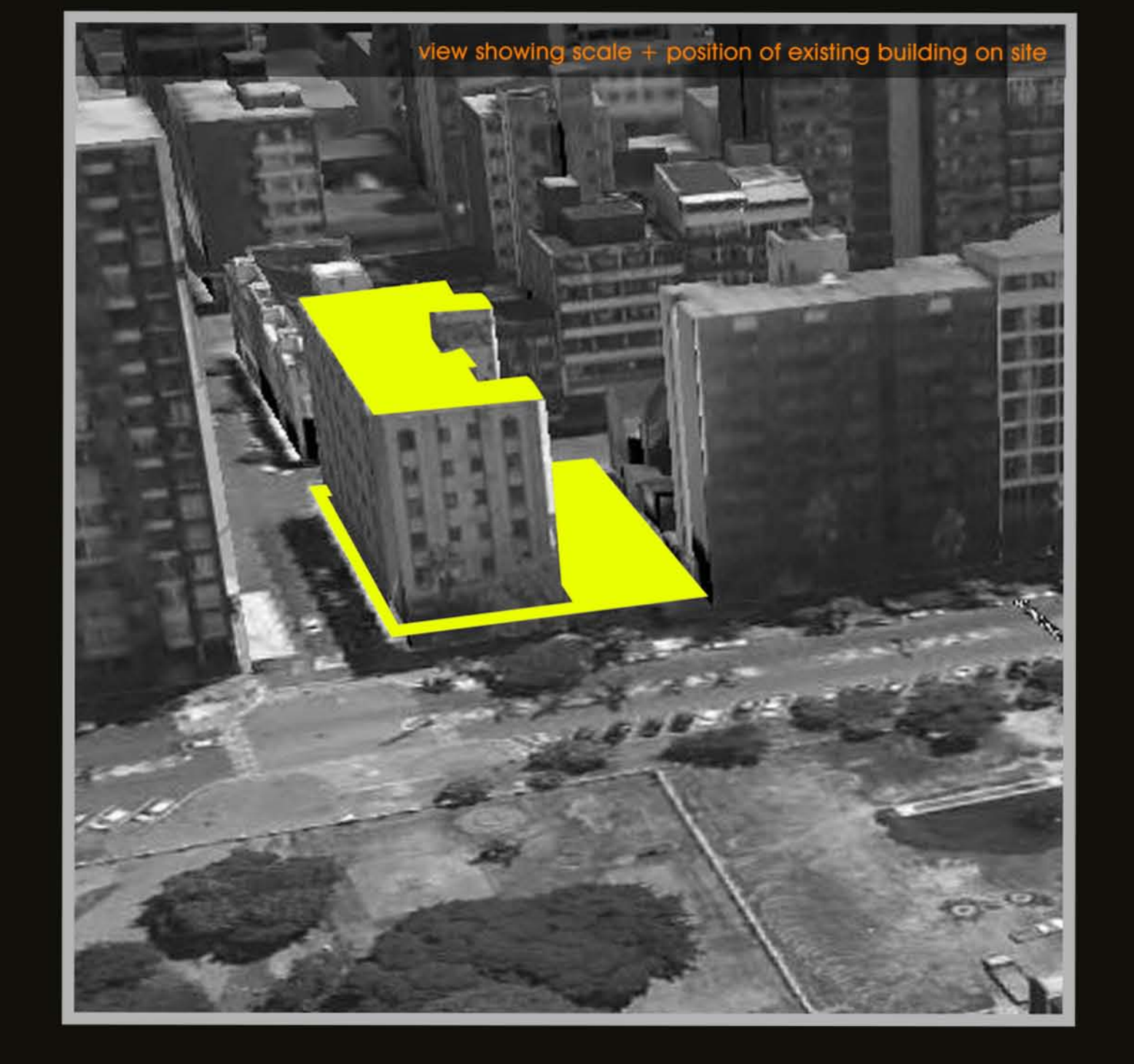
- bus drop-off
- taxi drop-off
- culture/heritage/social architecture
- religious architecture
- educational buildings
- healthcare buildings
- public/green open spaces
- pedestrian routes
- shopping, retail, entertainment amenity
- noise pollution sources



• TYPICAL FLOOR PLAN FIRST TO FOURTH FLOORS



• GROUND FLOOR PLAN



healthy.city.[site.analysis] option 3

healthy.city.[site.intervention] demolition

open spaces

existing public open/green spaces



proposed connections + linkages promoting permeability + connectivity



pedestrian

existing pedestrian routes



formalising routes to promote accessibility + permeability



green footprint

existing open space network



potential roof top garden site increasing green footprint



culture/heritage

existing pedestrian routes



new routes forming linkages thru cultural, education + heritage buildings



nodes/corridors

precinct nodes + corridors



proposed connections between nodes + corridors



scale

existing pedestrian routes + block sizes

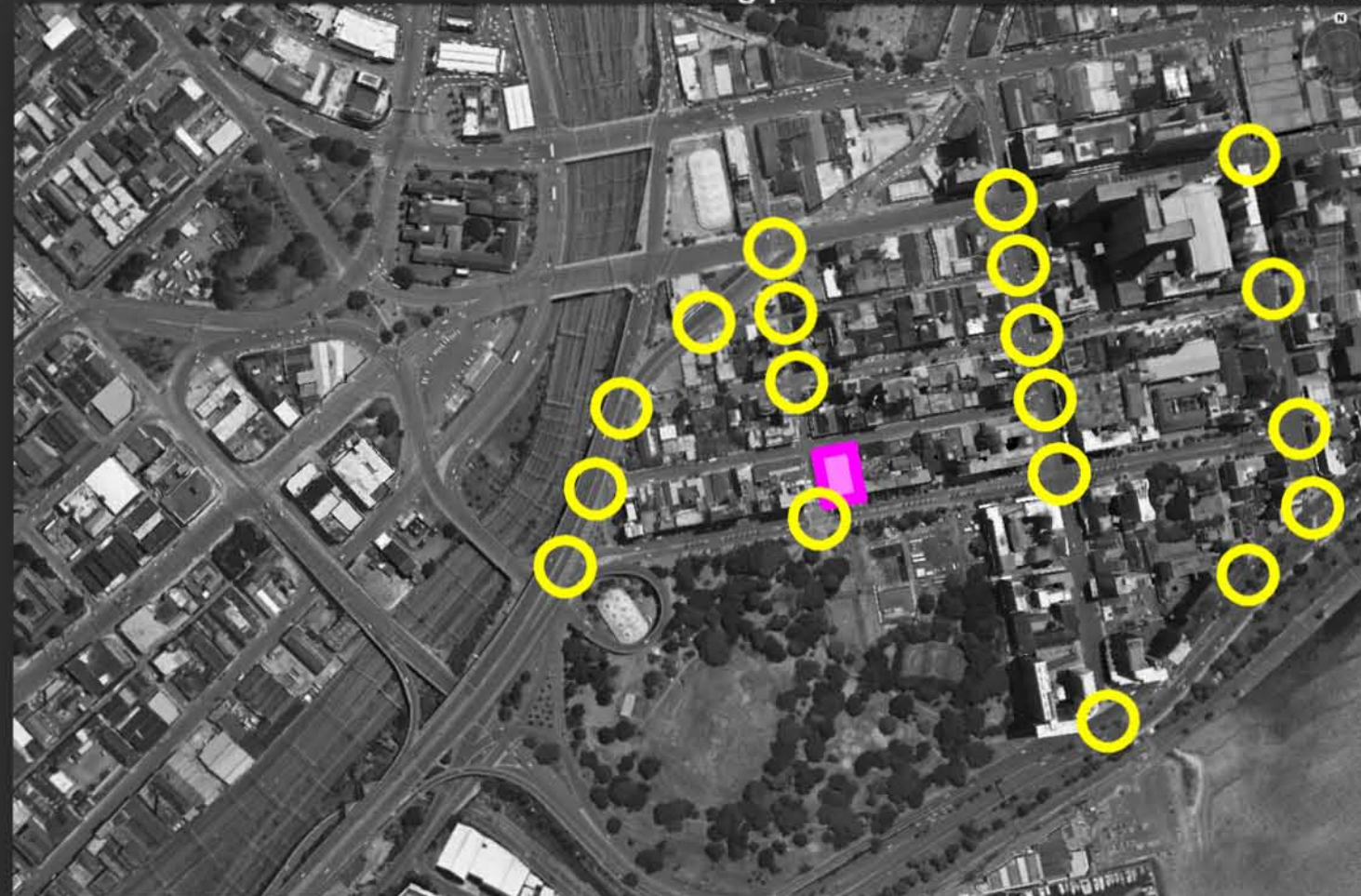


fragmentation of urban fabric: formalisation of routes accessibility + permeability

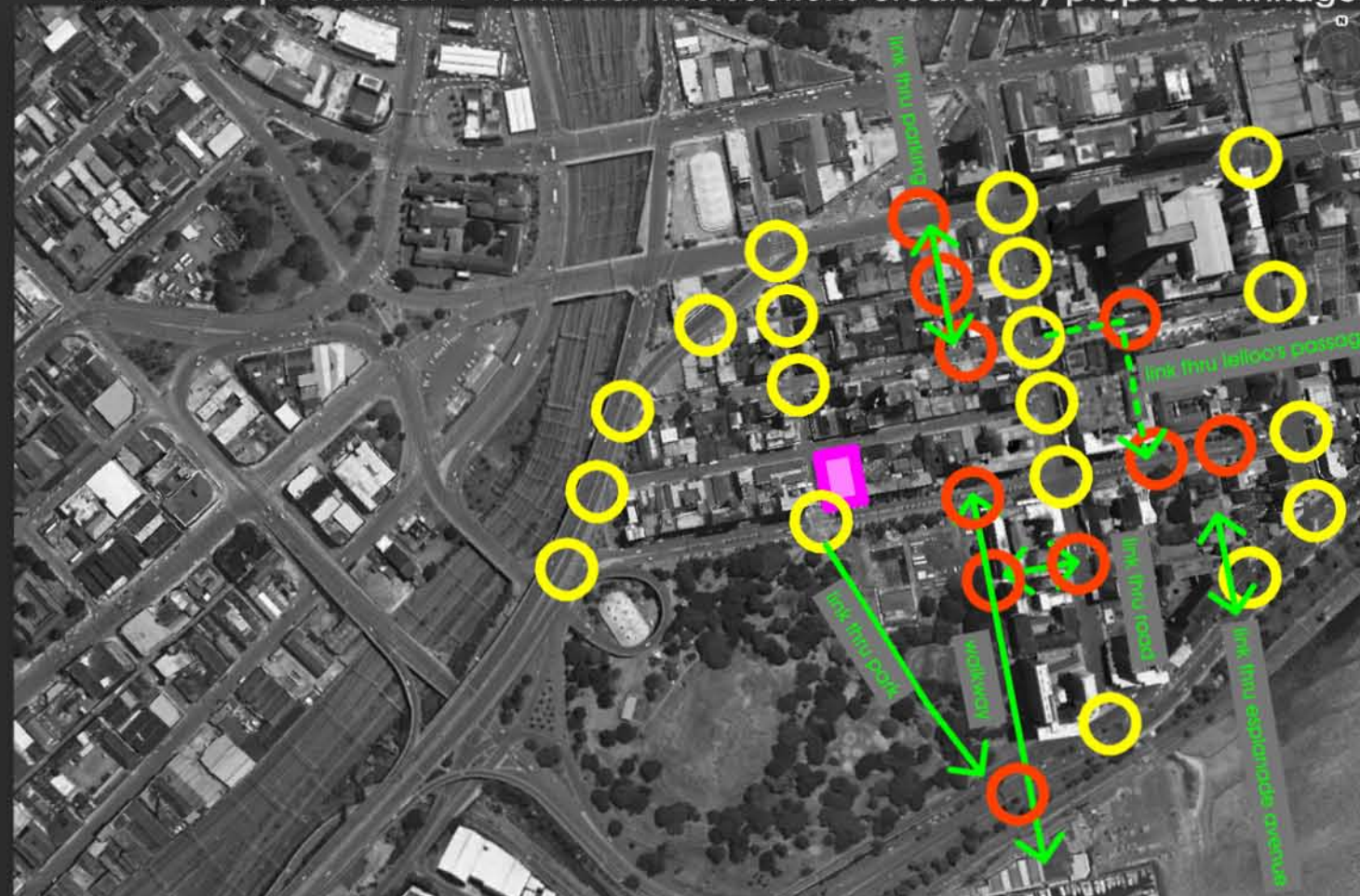


intersections

existing pedestrian + vehicular intersections



additional pedestrian + vehicular intersections created by proposed linkages



transport

public transport access points + parking facilities

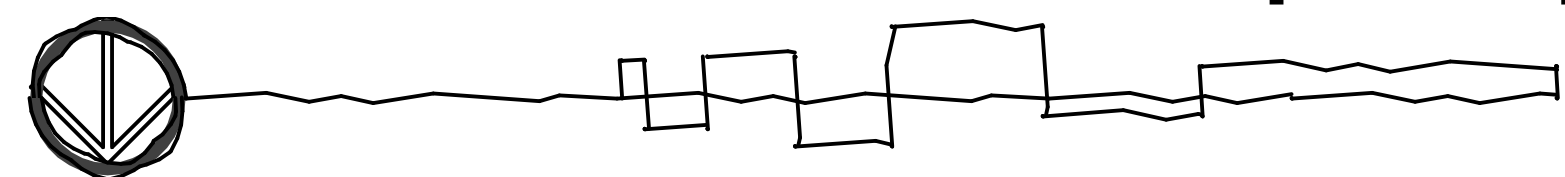


formalisation of public transport access points + off-site parking solution

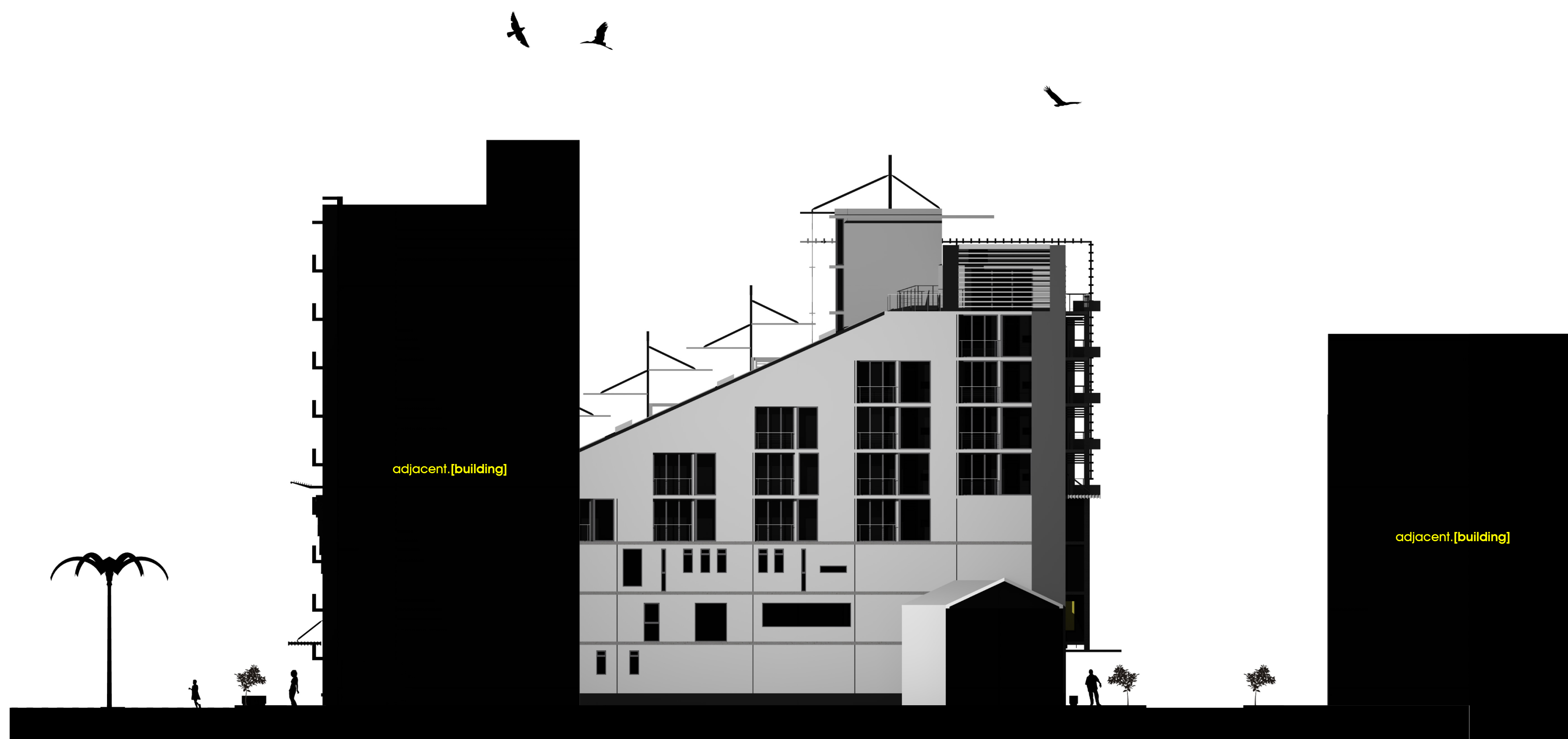
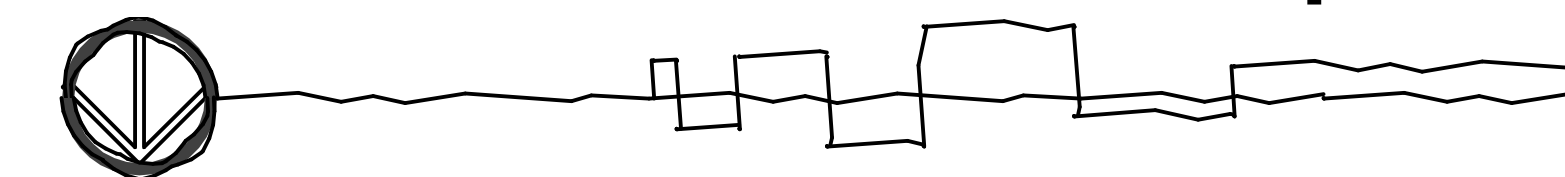




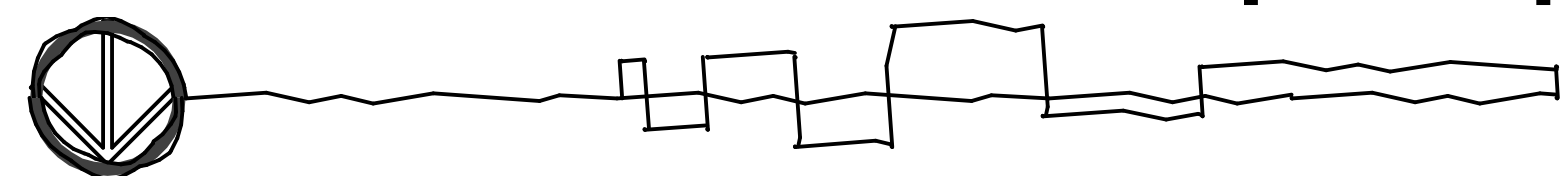
north.[elevation] scale 1:200



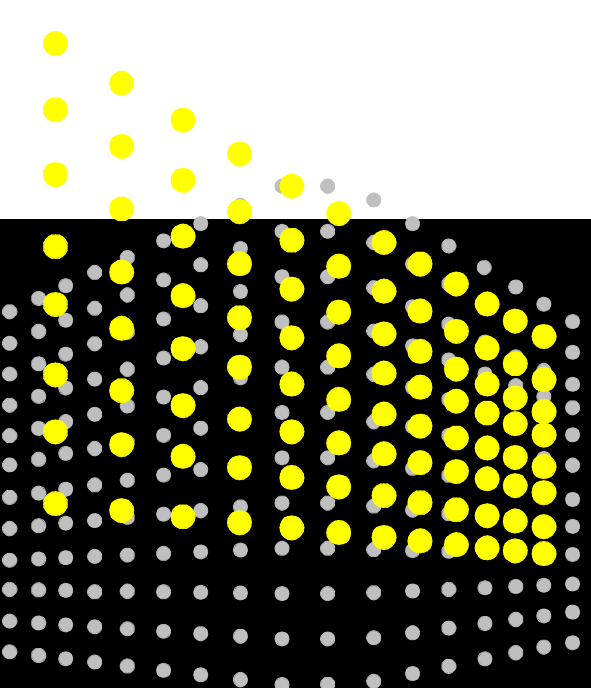
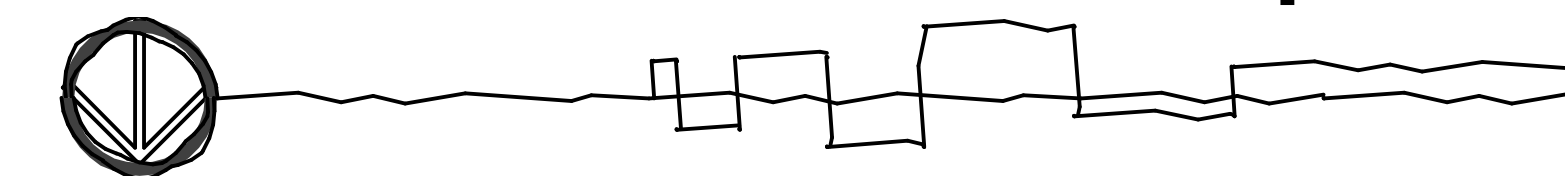
south.[elevation] scale 1:200



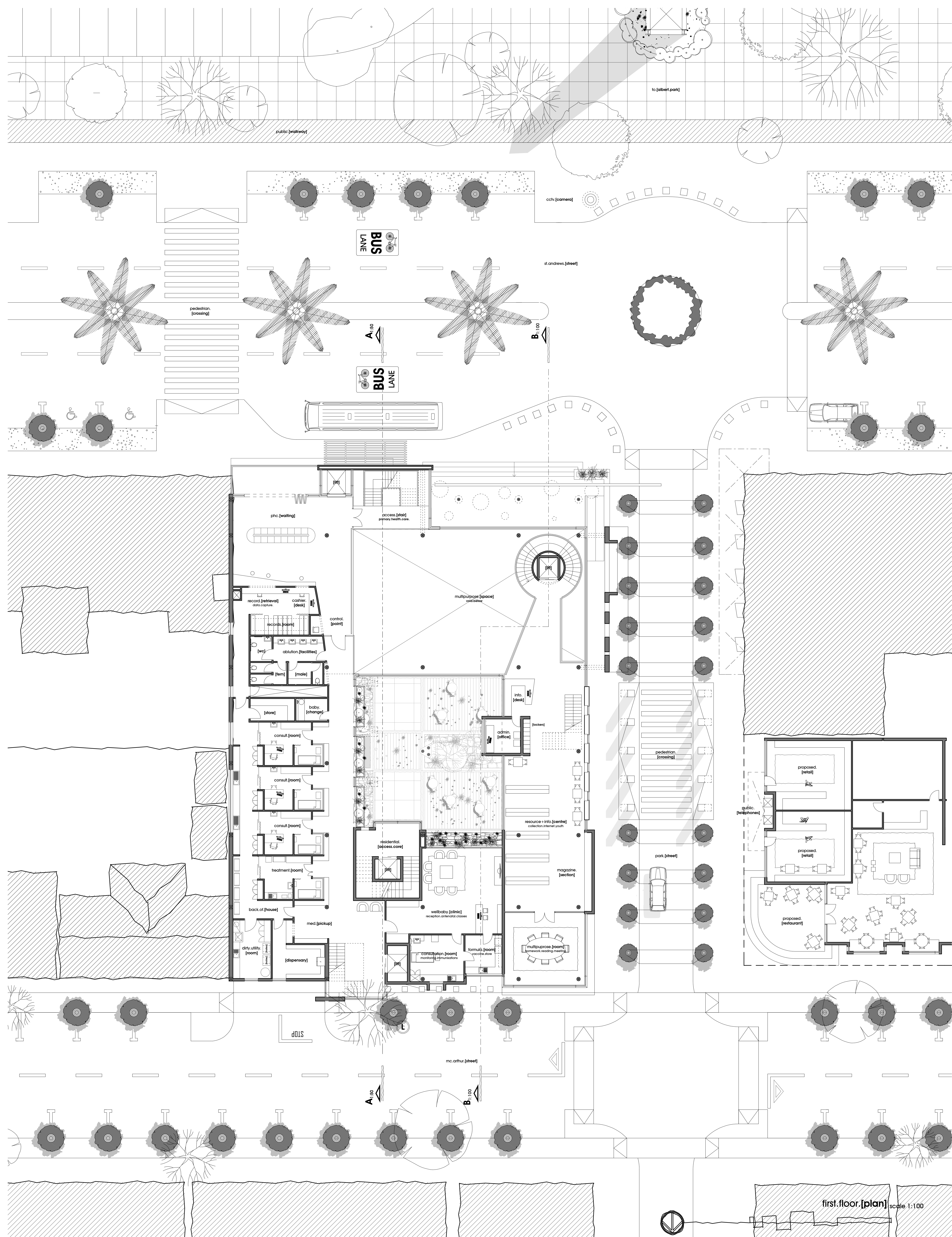
east.[elevation] scale 1:200

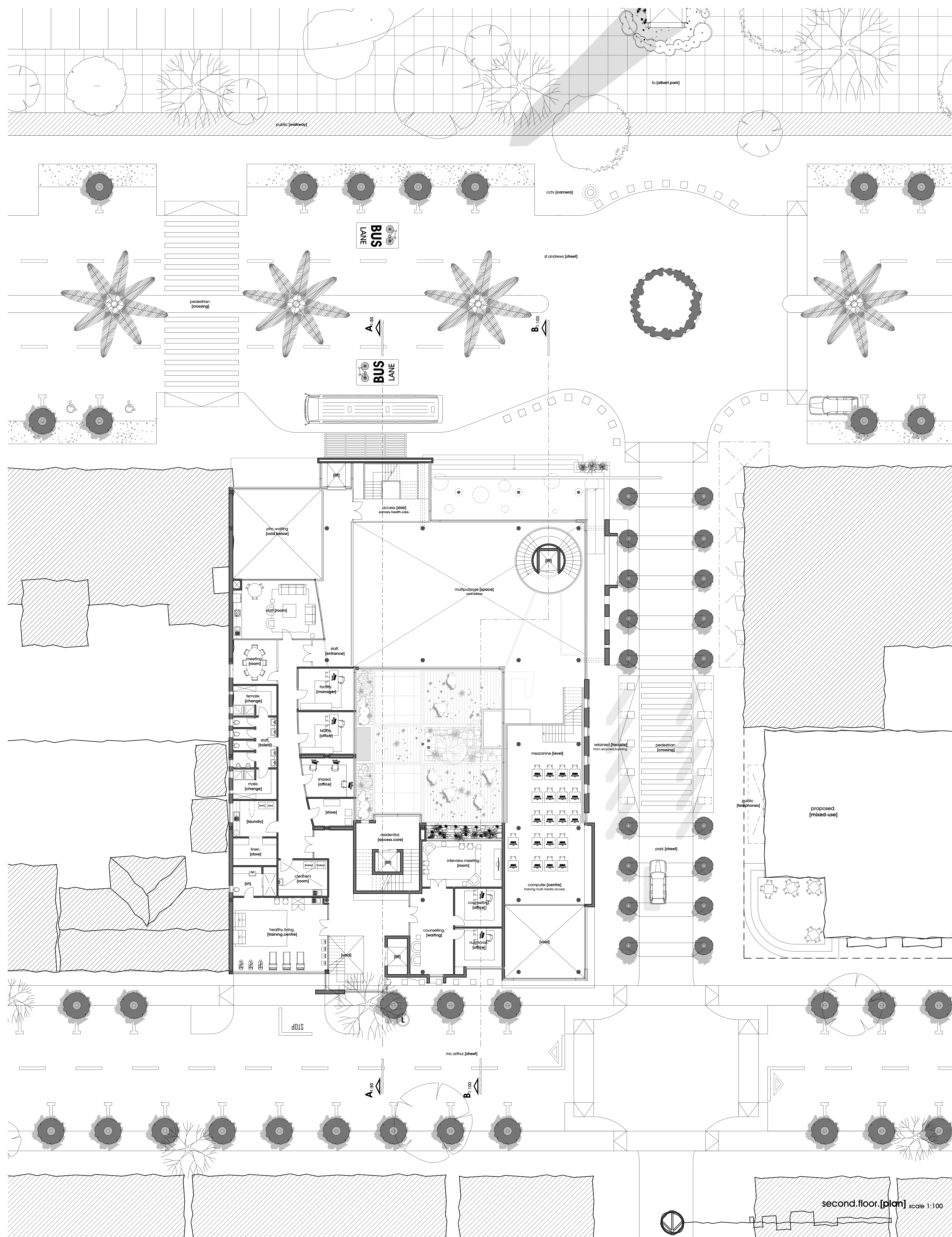


west.[elevation] scale 1:200

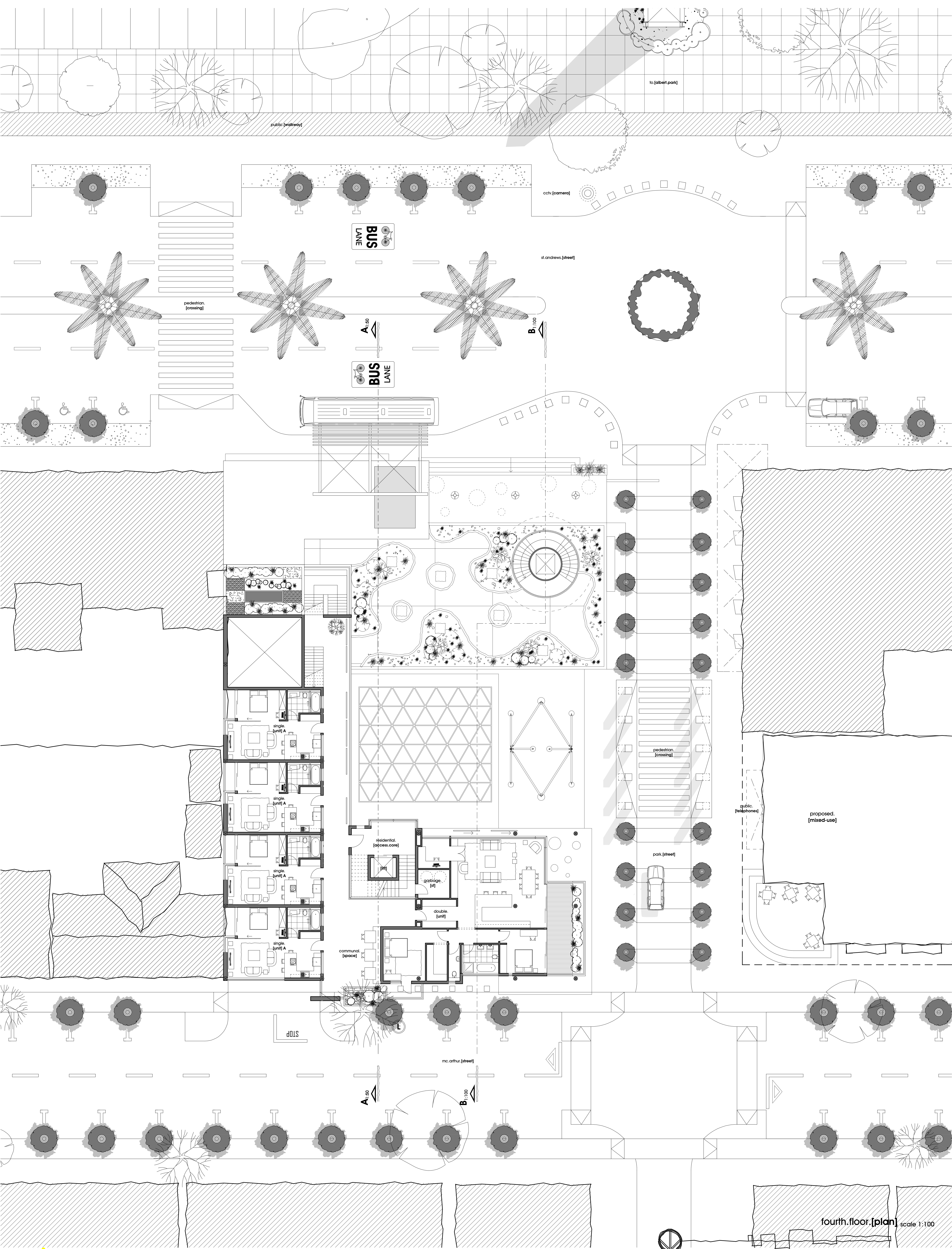


albert park | A CENTRE FOR THE URBAN COMMUNITY

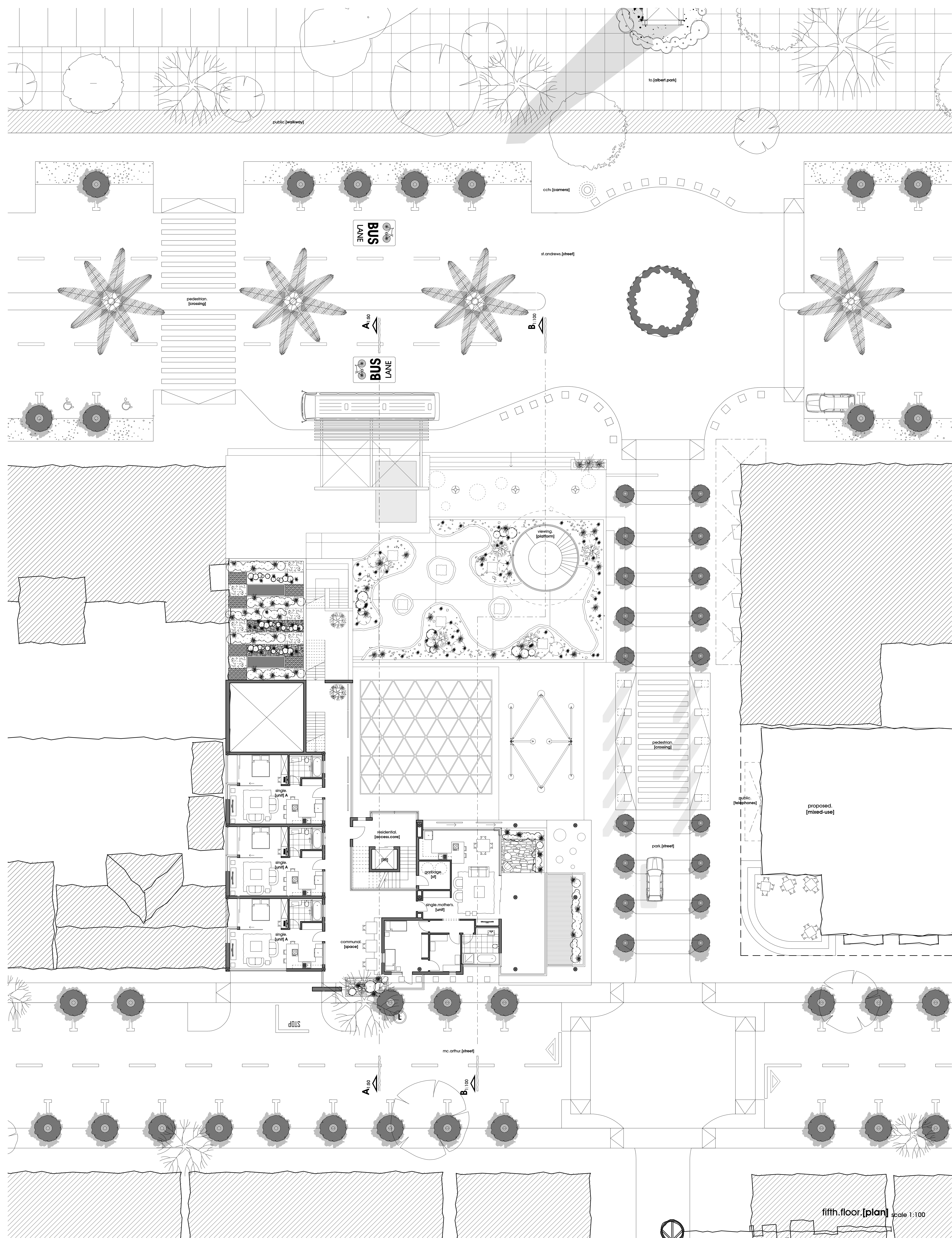




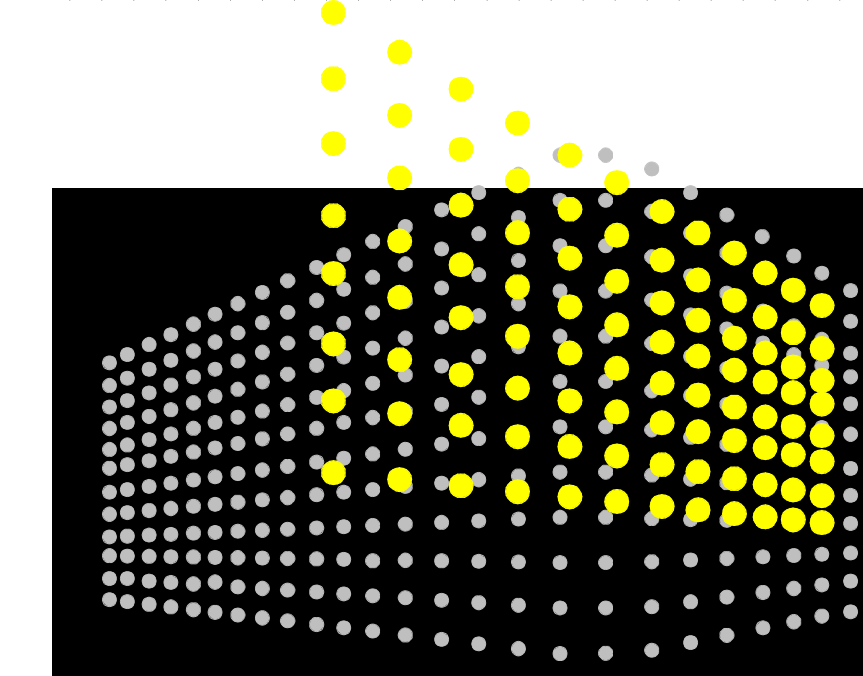
second floor.[plan] scale 1:100

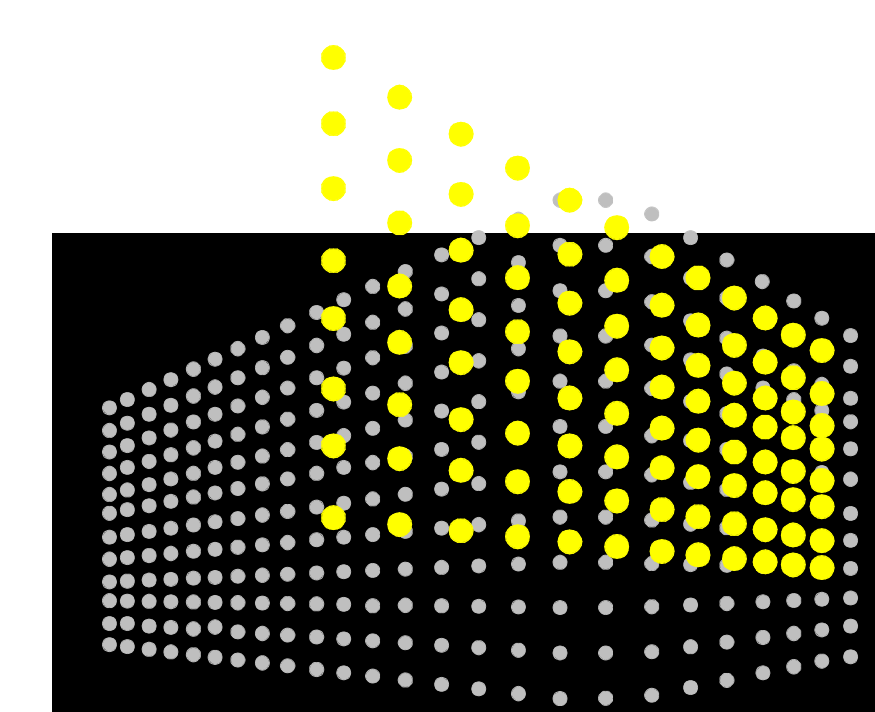
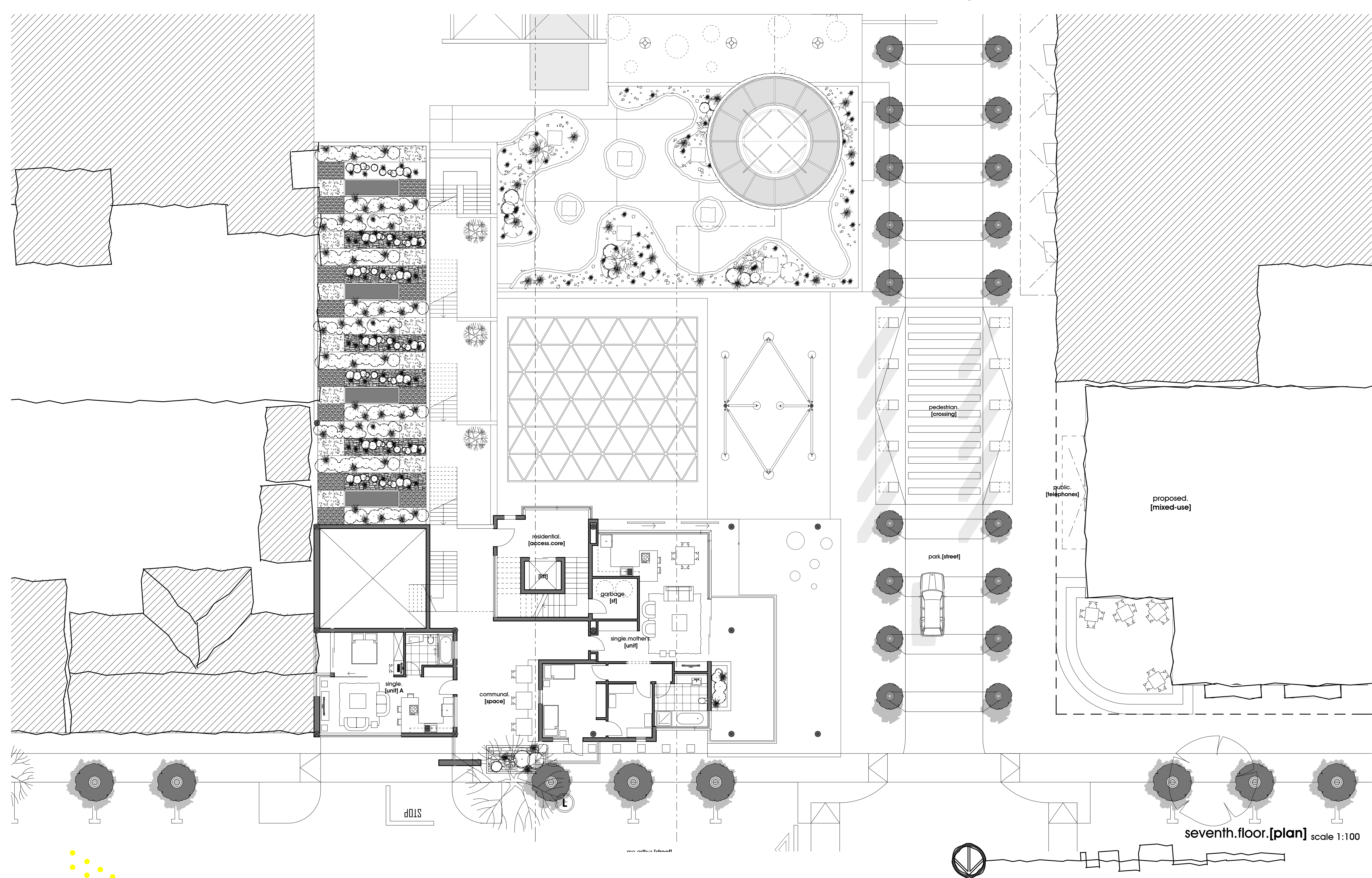
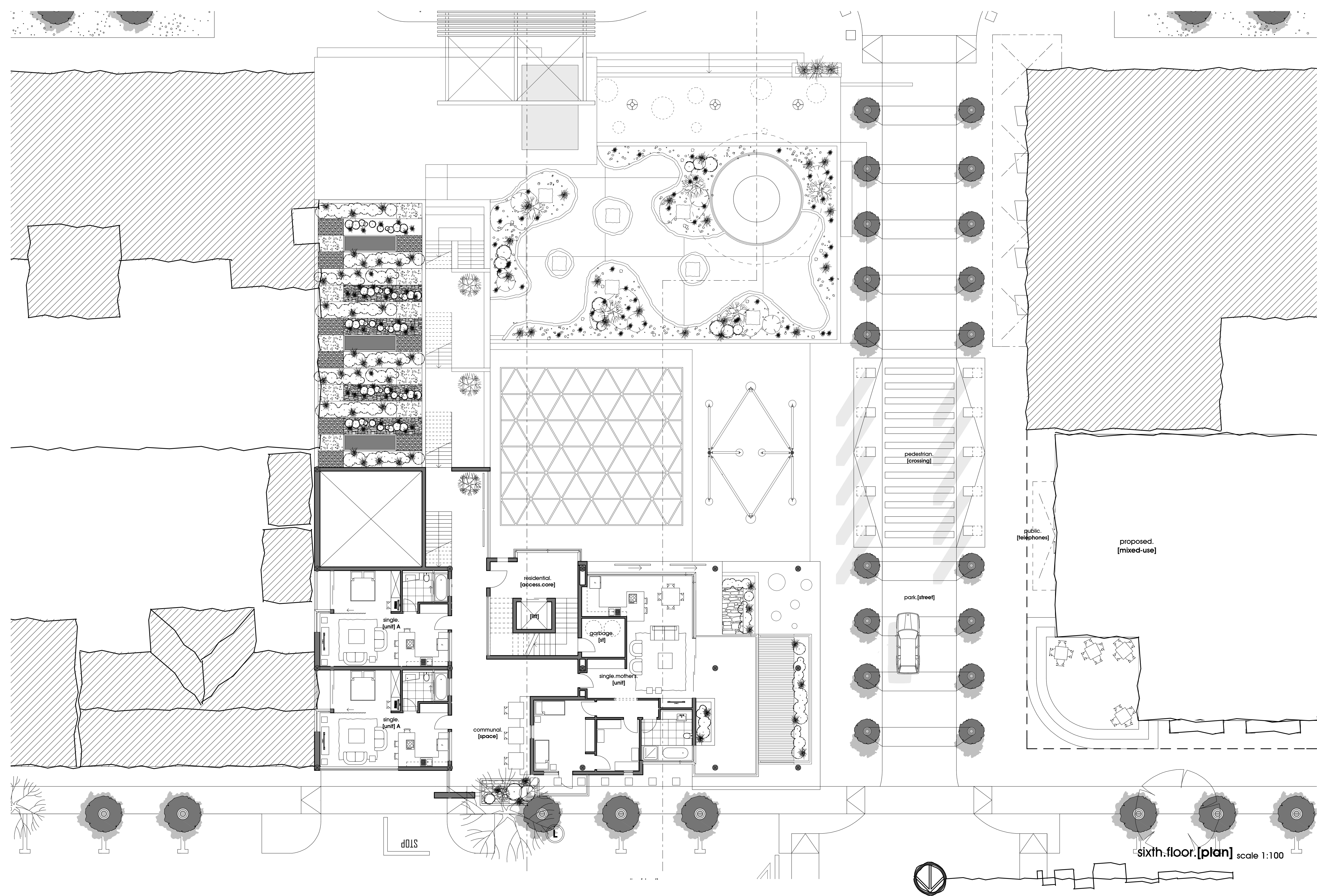


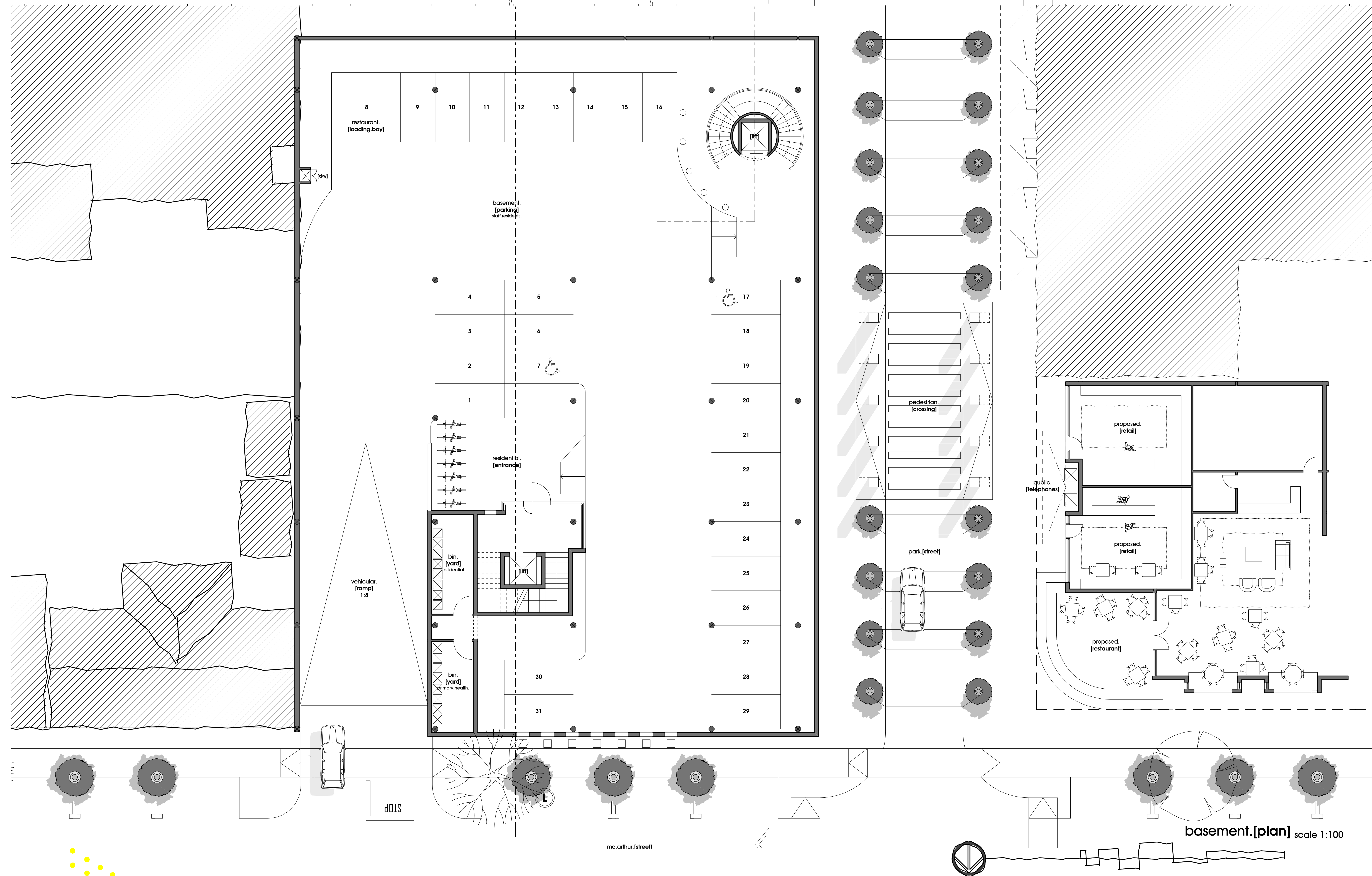
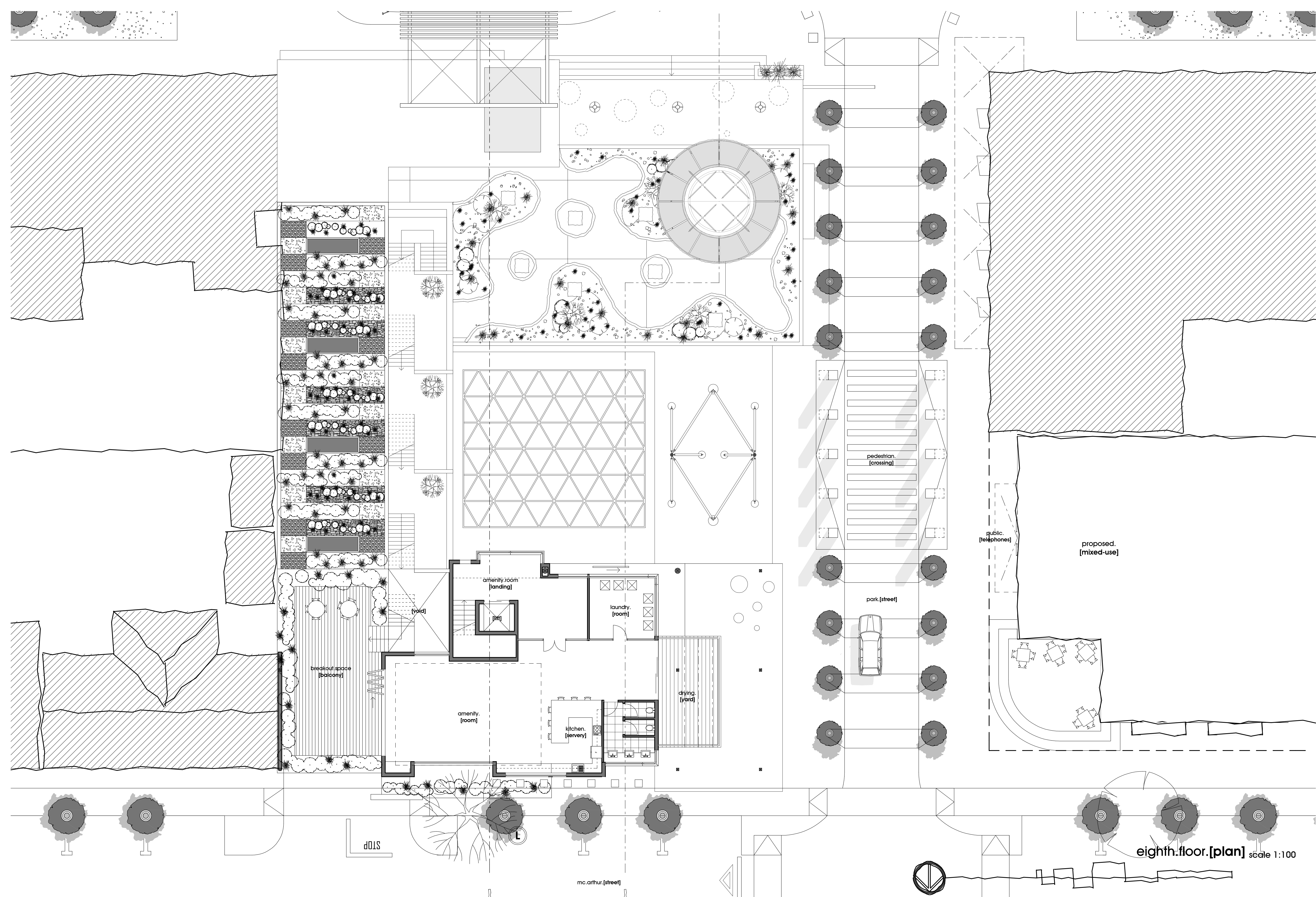
fourth.floor.[plan] scale 1:100



fifth.floor.[plan] scale 1:100









- urban design [goals]**
- promotion of healthy living**
- urban permeability**
- identify open roof tops for community gardens
 - multifunctional food space
 - places for social interaction and community engagement
- promotion of physical activity**
- activate pedestrian walkways
 - minimise the use of vehicle in cars parking garages with pedestrian corridors
 - foster links between nature and green open public space
 - develop pedestrian corridors
 - promote the use of bicycles (bicycle lanes, bike storage facilities)
 - provide facilities within new development which cater for exercise
- promote safety and security**
- surveillance**
- public presence
 - visibility
 - stepped terracing, balconies
 - the use of light and shadows
- relationship with the street**
- street furniture, landscaping, overhangs
 - ground floor commercialisation
 - buffer zones between traffic, parking, pedestrians and pavement
- introduce traffic calming mechanisms**
- speed bumps, rumble strips, platforms
 - change in road surfaces
 - turning and planting
- reduce vehicular presence**
- create parking garages close to vehicle precinct
- promote interaction**
- formalisation of routes**
- maximise the number of intersections
 - develop the grid of streets
 - foster links between green open, public and residential spaces
- street ornamentation**
- transparent ground floor building facade
 - self-landscaping
 - public corridors
 - street cafes, shops, seating
- legibility and coherency**
- highly legible urban fabric**
- articulate public transport access points
 - develop corridors and movement patterns
 - designated entrances to buildings and lots
 - create visual and audible guiding mechanisms
- develop relationship between habitual and non-habitual spaces**
- mixed-use development
 - articulate zones and corridors accommodating amenities
 - links to vehicle street
- development of socio-spatial needs + human scaled environments**
- articulate public, private and semi-public spaces
 - ground floor walkway overhangs on pedestrian corridors
 - designated entrances
 - representation of urban fabric
- cultural and heritage association**
- create passages and corridors that interact with buildings of culture and heritage
- urban design [interventions]**
- formalisation of existing pedestrian routes
 - creation of a mixed-use, residential, light industrial zone between precinct and the freeway which services the bus and before the freeway (providing additional services)
 - development of walking track through park and to vehicle embankment green open space
 - development of pedestrian link to vehicle street which connects to the Lambede St through foot street
 - incorporation of a mixed-use parking garage in over existing parking garage with links into public walkways
 - re-use of existing parking facilities as public corridors which link to proposed mixed-use parking garage
 - development of pedestrian crossing linking vehicle embankment to park street and across railway tracks towards bus stop and up the bus stop road spine with a pedestrian covered walkway access
 - increase pavement size by creating parallel parking as opposed to diagonal parking
 - creation of hedge and planting buffers promoting safety
 - creation of multi-use cycling and bus lanes
 - creation of public transport access point within ICESA College parking along Lambede Street, parking to be redeveloped in new parking garage
 - park street corridor to be closed on weekends and used for leisure, free markets good selling to promote interaction and offer a vehicle for street traders and entrepreneurs to promote and sell their goods
 - park street to detail (childrens artwork) to designate it as a slow moving pedestrian friendly street
 - one in front of dikonia centre to be closed off and utilised for activities and events relevant to the service of the centre, the adjacent music school and museum, the adjacent (existing) building could be used as public seating
 - the unused park behind sales museum to be reopened and bridges across car park into separate internal
 - the fenced off open space in front of cape dutch building has been opened to the road and its within the newly developed pedestrian link to anton lembede street
 - formalisation of the between vehicle street and at park street will create a pedestrian edge to the adjacent park whereby the residents can interact and communicate with residents within a level of privacy
 - roof tops within 12 stories which are residential in nature are identified as possible places for community gardens and can hanging facilities to promote interaction, activity and nutrition
 - park circles included in park road street to slow traffic
 - undeveloped area have been identified for mixed-use construction (park street)
- relevant [buildings]**
1. shadown of hope community health care centre
 - + busy bee hive creche day care
 - + home based care
 - + clinic and (large) local primary healthcare
 - + young children day care
 2. dikonia centre
 - + dance/performance area
 - + conferencing/meeting facilities
 - + internal cafe
 - + social agencies committed to justice
 - + NPO base
 - + religious social services
 - + legal resources centre
 - + human rights lawyers
 - + church
 - + skills training and development
 3. doctors surgery
 4. esplanade medical centre
 5. ymca
 - + adult student residential accommodation
 - + young people development direction
 - + computer centre (skills, literacy, business/entrepreneurial services)
 - + sports programmes (gymnastics, aerobics, soccer)
 - + youth after care programme (framework centre, life skills, performing arts)
 - + small chapel, hall, resource centre
 6. doctors surgery
 7. computer training centre
 - + computer literacy
 - + skills development
 - + internal access
 8. entrepreneurial development academy
 - + technical training
 - + theory, practical
 - + skills training projects
 - + skills development
 9. promise healthcare
 - + oncology healthcare provision
 10. prime care
 - + general consultation, doctor
 - + dentistry
 - + optician
 11. doctors surgery
 - + general consultation
 12. united family care scheme
 - + family planning, home based care
 13. first metro social housing agency (Russell Mansions)
 - + building refurbishment
 - + residential, ground floor retail/commercial
 - + 100 balconies, 40 single bed, 3 two bed
 14. first metro social housing agency (Carleton)
 - + building refurbishment
 - + residential, ground floor retail/commercial
 - + 32 balconies flats
 15. first metro social housing agency (Tabara)
 - + building refurbishment
 - + residential, ground floor retail/commercial
 - + 35 balconies flats, 8 one bedroom flats
 16. first metro social housing agency (Weltevrede)
 - + building refurbishment
 - + residential, ground floor retail/commercial
 - + 31 balconies flats
 17. first metro social housing agency (Staltdon)
 - + building refurbishment
 - + residential, ground floor retail/commercial
 - + 8 balconies flats, 14 one bedroom, 8 one-half bedroom, 4 two bedroom, 6 two-half bedroom
 18. sofico social housing company (Solymdar)
 - + building refurbishment, conversion of 4 buildings (1 step)
 - + access via stairs passage
 - + single bedroom, double bedroom, bachelor units
 - + walking drying hallway
 - + childrens play courtyard
 - + 14 one bed, 4 bachelor units
 - + commercial/retail component

