SECONDHAND ARCHITECTURE

FINDING VALUE IN THE EXISTING

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A 120-point thesis submitted to the Victoria University of Wellington in partial fulfilment of the requirements for the degree of Master of Architecture (Professional)

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School of Architecture

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It is the cycle of nature. Organisms utilize what is useful and discard what cannot be used anymore; blocking up the elimination of waste would destroy the community and life. (Melon 17)

ACKNOWLEDGEMENTS

ack · no · ledge · ments

noun the action of expressing or displaying gratitude or appreciation for something

Saying thank you doesn't seem to quite cut it - the appreciation for your time, the inspiration you have been, the guidance that you have given me, Kerstin, you have challenged my thoughts on architecture throughout this past year and I am grateful for it.

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ABSTRACT

Secondhand architecture explores the potential for significant high-density housing models to be revitalised and offered a second life.

Much of the medium to high-density housing stock built in the mid to late twentieth century is tired, derelict and under threat of demolition. Buildings from this period, both here and internationally, are increasingly dismissed as outdated for not meeting a range of today's housing needs. A combination of technical and functional obsolescence have contributed to their downfall along with numerous social and management issues, of which local authorities are failing to recognise and act on.

Today the demand for housing is considerable. Governments and private developers seek ways to address this demand yet frequently overlook the upgrade potential that this current housing stock possesses. To some extent, this is due to failure by authorities and the public to value their intrinsic heritage and architectural significance. The impetuous decision to demolish risks compromising our living heritage and losing a portion of our significant built environment.

In New Zealand and overseas, there is a general lack of recognition for the historical significance of our modern architecture. Amongst modern buildings, the post-war high-density public housing models is considered of lesser significance here due to the higher appreciation for detached suburban housing being entrenched as the desired norm.

This thesis makes a case for adapting and reusing modern public housing to operate as living patrimony - exploring their inherent value through design and reviewing their potential to assist increasing density within our inner cities. The George Porter Tower, designed by prominent architect Ian Athfield in the 70s, faces demolition due to its perceived poor living conditions and susceptibility to earthquakes. Using the Tower as a case study, this thesis explores strategies to repair, improve and reform our significant public housing models. These strategies are explored through five layers, providing a methodology that identifies the successes and failures of the case study and guide the iterative design process.

This thesis argues for the rehabilitation of a building to address the contemporary housing requirements. In acknowledging the value of these as a critical part of our built heritage, it demonstrates how history can exist within the present to maintain links to our past. In doing so, it celebrates the continual metamorphosis of the building, adding to its heritage values.

Secondhand architecture considers that buildings should be constantly evolving, not something that is frozen as icons of the past.

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“Transforming an existing property represents the only opportunity to go much further in the design of new ways of living. It’s a question of never demolishing, never removing or replacing but always adding, transforming and using” - Anne Lacaton (Ayers)

PROBLEM

In Wellington, where the shortfall of homes has attained the status of a "housing crisis", the demand for housing that satisfies current private markets is one of the main issues of the 21st century. This crisis has called for an investigation into the revitalising of obsolete high-density public housing stock inherited from the post-war surge of mass production.

Similar issues are seen abroad, and in London, the demolition of the Robin Hood Gardens could become a precedent position for obsolete buildings. Throughout London, examples show that through contemporary urban planning, the domestic and urban potential of much of the post-war housing stock makes it difficult for the current owner and local councils to invest in their refurbishment (Melon 17).

Albeit, public opinion is often critical of this typology for their perceived failures. The intrinsic heritage value, developed as a result of a housing demand in the past, offers immense potential for renovation and could satisfy the demands for high-density living today.

HOW CAN OUR **EXISTING** BUILDING STOCK OF HERITAGE
SIGNIFICANCE BE BETTER VALUED, ADAPTED AND REUSED IN
ORDER TO SERVE AS **LIVING PATRIMONY?**

HERITAGE FRAMEWORK IN NEW ZEALAND

her · i · tage

noun something that is handed down from the past

New Zealand has two different heritage identification systems; Heritage New Zealand's national register (a requirement of the Heritage Act 2014); and the heritage lists maintained by each of the country's 73 city and district councils as part of their district plans (a requirement of the Resource Management Act 1991).

In both these systems, there is a distinct lack of recognition for buildings constructed post-1930, and throughout the country there are many more that have not been considered. The Modern Movement's youth is in itself a major difficulty (Guillet 152). John Allan suggests that their absence is due to a misunderstanding of heritage - somehow legitimised by age and familiarity ("Private Privilege" 651). Another factor may be due to the ubiquity of modern buildings, it has not received thorough historical and heritage attention (Lewi 551).

Over the past few decades, the heritage of modern architecture has appeared more at risk than any other period. This built-inheritance that glorified the dynamic spirit of the Machine Age employed advance technology that has not always endured long-term stresses. The functions which the buildings originally met have also changed substantially (Guillet 151).

In many respects their conservation dictates more challenges than those of earlier eras due to their technical and philosophical problems (Kindred 1). Little guidance is provided in New Zealand by either local or national jurisdiction of how to conserve a building's heritage and approach to adaptive reuse. Consequentially listed buildings are left in a mausoleum-type state. Peter Eisenman views this type of preservation as a reduction of history - a form of nostalgia that reflects an unacknowledged anxiety towards the present (qtd. in Kindred 4).

FIG01 - Approximately one in fifty buildings on the WCC Heritage list is constructed post-1930.

FIG02 L-R - Centennial Flats, Dixon Street Flats and Grey's Avenue flats built under the Labour's 1937-1949 programme, are the only high-density public housing projects that have been listed under Heritage New Zealand. Yet these projects provide no sense of the overall scale of Labour's programme.

FIG03 - Gordon Wilson Memorial Flats, recognized by the WCC under its heritage listing, is the only building that post-dates Labour's programme. A once prosperous rental accommodation premise.

FIG04 - GWMF as it stands today, a 'red stickered' building, abandoned and awaiting its next steps after being sold to Victoria University of Wellington in 2016 and having its heritage listing revoked by WCC.

pa · tri · mo · ny
noun property inherited

A number of our high-density public housing stock, built between 1950-1980, is well positioned in urban locations. This is largely due to the initiatives undertaken by local councils and the central governments at the time to bring housing into the CBD.

The highly innovative buildings that employed pioneering techniques and materials have resulted in unforeseen problems, together with misguided and poor maintenance. This has led to rapid deterioration. Some buildings have also been deemed unsafe due to their inability to withstand earthquakes.

A shift in political, social and economic contexts has also seen these buildings being demolished by local councils and replaced with more contemporary buildings to meet current requirements. But what of their inherent value? Demolishing to start from scratch is an option not without controversy, because this is not a solution which targets the architectural and social roots of the problem (Per et al 198).

Today, our requirements have also shifted and technological advances have been made since these buildings were built. So how can we adapt these buildings to become living patrimony? Housing is designed for the living. Its evolution and capacity for transformation is essential (Montaner 15).

SCOPE

pa · ra · me · ter

noun a limit or boundary which defines the scope of a particular process

To understand modern public housing as living patrimony, and its ability to allow for transformation, is a three-fold process according to Josep Montaner. Technical performance, urban location and whom the housing is for, are paramount in contributing to their success or failure.

This design-led research is restricted primarily to physical and spatial characteristics. It explores the technical and architecturally significant aspects that directly inform the restoration of the physical building while also taking into account the urban location and its connection to a wider city network.

While technical performance and urban location are addressed, Montaner recognizes that the inhabitants themselves also play a key role in contributing to the success or failure in the transformation of the building (12). This thesis provides limited discussion into user types and the operational systems involved in the upkeep of an apartment building.

Along with this, is the topic of cost and funding. For the reuse of existing buildings to be a viable option, there must be key players invested in its rehabilitation, although it is acknowledged, specifics are beyond the scope of the research.

AIMS & OBJECTIVES

as · spire

verb direct one's hopes or ambitions towards achieving something

This research aims to analyse the existing modern high-density public housing typology that has reached a critical point in their lifespan - to be demolished or rehabilitated. The potential to be reused for contemporary living offers a unique model for high-density living that will be developed as an alternative solution to demolition. This responds to the 'housing crisis' today and simultaneously negotiates the architectural and social heritage value through its transformation. By doing so, it also responds to current heritage practices, or lack thereof, surrounding modern heritage.

The principle objective of this design-led research investigation is to develop a model of high-density living through the recycling of the existing building stock which shall;

- review and critique the current building's design, highlighting successes and failures
- regenerate a declining asset
- revitalize a place in such ways to honour the unique architectural, historical and social significance
- promote neighbourliness and flexibility
- develop a criteria for repairing, reforming and improving the existing building stock

The research aims to explore a local issue in a manner that can be applied to overseas modern heritage conservation. It aims to provide a viable methodology to transform existing buildings to accommodate new living requirements, thus providing mediation between past and future ideals, creating further opportunity to enrich the diverse fabric of a city as well as offering suitable accommodation.

THE SITE

GEORGE PORTER TOWER

Arlington One, located in Mount Cook on the fringe of the Wellington CBD, is less than 50 years old, and already it is viewed as failing to meet today's living demands.

The estate, designed by prominent local architect Ian Athfield in the early 1970s includes an iconic tower block, the George Porter Tower, alongside a low-rise medium-density village. It has the potential to be rehabilitated to ease the current housing crisis.

Wellington City Council is reviewing the status of the complex and adjacent sites and is already favouring demolition and rebuilding (Schouten).

^
FIG05 - Map of New Zealand, no scale.

FIG06 - Map of Wellington, no scale.

George Porter Towers

Mount Cook

ABBREVIATIONS + DEFINITIONS

CBD

Central Business District

GPT

The George Porter Tower

GWMF

Gordon Wilson Memorial Flats

Modern architecture

Term broadly used to describe twentieth century architectural initiatives concerned with the new.

Patrimony

Any qualities or characteristics that is inherited or passed down from previous generations.

NBS

National Building Standard

RHG

Robin Hood Gardens

WCC

Wellington City Council

THE METHOD

EXISTING BUILDING

the problems

design characteristics of the past
derived from analysis of existing building and
other case studies

THE FIVE LAYERS

THE HERITAGE

the significant

background research and the current
situation assessed

PROPOSED BUILDING

the conclusions drawn

explored through design iterations
and exegesis

THE INHERITED
the ideals of living, today
design characteristics for today and the
future derived from
literature and case studies

FIG08 - Methodology diagram, outlining process of thesis
and how the design exploration responds to the problems.

METHODOLOGY

FIVE LAYERS

Based upon research and analysis carried out on the GPT, five layers were derived through clustering successful and problematic areas into common themes. These themes are pertinent to other notable buildings of this period such as Park Hill, RHG and Unité d'Habitation.

They provide criteria for the analysis of the existing built form and direction for subsequent design interventions towards the adaptive reuse. These layers are broken down into: context, morphology, commons, access and dwelling form the five areas of research, and are defined on the following page.

CONTEXT

The building's relationship with its site and broader surrounds

MORPHOLOGY

The form and structure of the building

COMMONS

Spaces and amenities shared by residents

ACCESS

Vertical and horizontal paths of movement within and around the building

DWELLING

The residential unit, its internal layout and relationship to other units, public and common areas

^

FIG09 - The five areas of research.

MODES OF INTERVENTION

^
FIG10 - Modes of intervention diagram, how the design responds to three different levels of alterations.

Modern architecture was the result of a revolt against traditional decorative buildings. It was a time of great exploration and the values of precision and functional design became of great importance. As a result modern architecture comes in a wider range of styles and more specialized building types than any other epoch. Therefore the modern conservation movement is required to develop its own discourse and toolbox as traditional approaches are no longer a valid currency.

Restoring a building to its original state is problematic for it is not a solution that targets the root of problems (Per et al. 198). John Allan has undergone alterations on a diverse range of modern buildings. A pattern that has emerged out of his observations is the requirement for three forms of design intervention; repair, improve and reform ("Points of Balance" 15). He discusses the balance required for these buildings to function in an appropriate way whilst still being true to the ideals of their original designers (Kindred 3). To achieve such equilibrium, a departure must be made from the traditional precepts and protocols.

THE HERITAGE

TIMELINE OF PUBLIC HOUSING

HOU
WELLINGTON, NZ
Novak+Middleton
and Partners

ARLINGTON FOUR
WELLINGTON, NZ
Moller
1983

TE
D

TE ME

1985

1995

**BALFRON TOWER
RENOVATION**
LONDON, UK
2011 - 2014

2005

**TOUR BOIS LE
PRÊTRE RENOVATION**
PARIS, FRANCE
Lacaton, Vassals and
Druot
2009

**CENTRAL PARK
RENOVATIONS**
WELLINGTON, NZ
Novak+Middleton
2014

NOW
Wellington City Council
Housing Upgrade
Programme
20 year period

2015

PARK HILL RENOVATION
SHEFFIELD, UK
Urban Splash
2009 -

**ARLINGTON FOUR
DEMOLITION**
2016

TE ARA HOU RENOVATIONS
WELLINGTON, NZ
Novak+Middleton
2010

background

THE TIME

New Zealand has a rich heritage of public housing being the 'first central government in the Western world to build public housing for its citizens' (Gatley, "Public Housing" 684). It came into effect when its Liberal government passed the first Workers' Dwellings Act in 1905 and built small groups of houses around cities and towns. Better known than these early twentieth century initiatives is the extensive housing programme of the first Labour government (1935-1949). This comprised of approximately 30,000 detached and semi-detached houses nationwide and twelve blocks of medium and high-density flats in the two largest cities, Auckland and Wellington - their reaction to the housing shortage at the time.

This trend continued to be built on by later governments. The larger, wealthier local councils of Auckland and Wellington joined the central government in providing public housing, focusing on building medium to high-density rental flats located in urban areas rather than suburban locations (Gatley, "Public Housing" 684).

Most of the 30,000 houses built by the Labour government were of traditional English cottage style - conservative in appearance; clad in timber or brick and included either hipped or gabled roofs. Slowly, the form of public housing began to change, aligning with the international Modernist movement for higher density living. By the early 40s, New Zealand had adopted the concrete slab block with the erection of Centennial and Dixon Street Flats alongside Grey's Avenue and Symonds Street Flats, all contributing to the development of modern architecture in New Zealand (Gatley, "Public Housing" 686).

<<

FIG11 - (Previous Page). Timeline of public housing.

FIG12 - New Zealand's first state house, in the traditional English Cottage style.

FIG13 - Dixon Street Flats towering over the houses in Wellington at the time of its completion.

FIG14 - Upper Grey's Avenue Flats in Auckland, contrasting in style to the traditional house.

FIG15 - Unité d'Habitation, an example of the Tower in a Park-like setting condition that Arlington One attempted to sway from.

FIG16 - Development of Pruitt Igoe shortly after its completion, contrasting to the housing surrounding it.

FIG17 - Aerial of Arlington One and the GPT as it was completed in 1976.

At this time internationally, Le Corbusier's bold and ambitious Unité d'Habitation started to break ground and the close of World War II saw the United Kingdom get rid of their Victorian slum housing - replacing it with tower blocks. Unité's boldness came from social implementations as it sought to embody accommodation for the masses, as well as providing shops and educational and sporting facilities. It housed 1,600 people under one roof. During this period, the collective housing prototype started to take shape and similar large housing estates began to develop such as Park Hill, Pruitt Igoe and RHG.

During this period in Wellington, George Porter was chairing the Housing Committee and council became an important provider of public housing. They replaced a number of run-down cottages with medium to high-density dwellings in the city as a reaction to the extensive suburban sprawl. Notable developments included Central Park, Newtown Park and Arlington One and Four. Come the end of the 70s 1,200 council units had been completed and another 1,200 were to follow in the coming years. The selection of architects by Porter was significant, with a number of young architects chosen who then went on to have remarkable careers, such as Ian Athfield and Gordon Moller, responsible for Arlington One and Four respectively (Gately, "Public Housing" 689).

THE ARCHITECT

SIR IAN ATHFIELD

15 July 1940 - 16 January 2015

1963

Graduated from the University of Auckland with a Diploma in Architecture.

Started working at Structon Group

1965

Became a partner at Structon Group

Started working on Athfield House

1968

Left Structon Group and formed Athfield Architects

1970

Commissioned to design Arlington One

2004

Awarded the NZIA Gold Medal

In the context of New Zealand, Ian Athfield plays a key role in questioning the traditional conventions of design. Being unafraid of a public audience and often voicing his opinion, he critiqued our built suburban environment, claiming that it was monotonous and needed to be challenged by architects (Gatley "Athfield Architects" vi).

This transpired into his eccentric and unconventional housing designs contrasting the typical suburban house, with the iconic 'Ath-style'. They were often perceived as outlandish as they often adopted modernist ideals whilst playing with the geometries of traditional architecture.

Athfield consciously designed buildings that would lend themselves to change rather than being seen as finished objects. In his opinion, architecture was a process of continual growth that should not be preserved and frozen from decades past (qtd. in Gatley, "Athfield Architects" 2).

The ever developing design of his Khandallah home is an example of this mindset along with his strong opposition to a heritage listing on his private residence. Athfield's belief remains relevant in the approach to the redevelopment of our present dated housing stock.

FIG18 - Portrait of Ian Athfield.

TO ATHFIELD, ARCHITECTURE WAS A PROCESS OF CONTINUING GROWTH MEANING THAT HE CONSCIOUSLY DESIGNED BUILDINGS THAT WOULD LEND THEMSELVES TO CHANGE RATHER THAN BEING SEEN AS FINISHED OBJECTS WHICH IS SO TRANSPARENT IN THE EVER GROWING DESIGN OF HIS OWN HOME. (QTD IN. GATLEY "ATHFIELD ARCHITECTS" 38)

FIG19 (clockwise from top)
 - Sommes Island Housing Scheme, Buck House and Pearce Apartments, quickly formed Athfield's notable style, inspired by the white architecture of the Greek Islands and east Spain.

<
FIG20 - Athfield's House - making use of the highly visible site, white form stepping down the hillside; the design of his home draws attention from many, whom might want unconventional houses (Gatley, "Athfield Architects" 9).

THE BUILDING

ARLINGTON ONE AND THE GEORGE PORTER TOWER

ARCHITECT

Ian Athfield and King & Dawson Architects.

LOCATION

Wellington, New Zealand

DESIGN & CONSTRUCTION PERIOD

1964, 1972-1976

PURPOSE

Public housing for WCC

DWELLING NUMBERS

77 units comprising of:
42 bed-sitting units
33 one bedroom units
2 two bedroom units

OTHER AMENITIES

external laundry units, open air drying at roof level,
computer room at ground level

George Porter encouraged Athfield to collaborate with established firm, King & Dawson on the design of Arlington One for the local council. It was a catalyst project for young Athfield, giving him both publicity and recognition for its distinctive forms and design.

With schemes like Unité and Park Hill already completed, the design of Arlington One too heed of emerging overseas ideas regarding mixed development and collective housing. Arlington also demonstrated the influence of Athfield's early concepts on fostering community living seen through unbuilt proposals for Sommes Island and the Manila Housing Scheme.

It was ground breaking in applying a low-rise, medium-density approach to public housing, far removed from the anonymous towering slab blocks in a park-like setting. (Gatley, "Long Live the Modern" 203). There was still a tower, fittingly named George Porter Tower - sculptural in form compared to its counterparts.

Currently, the majority of the units are occupied but there are a number of untenanted flats.

FIG21 - A photo montage of the early concept of Arlington One and the GPT with exposed end units.

FIG22 - Arlington One site aerial with residential and industrial surrounding the new development

69 car park
marked on map

HERITAGE SIGNIFICANCE

a · pprai · sal

noun the act of estimating or judging the value of something or someone

GPT is a significant example of Athfield's tectonic language, evident in his early works that launched him into the canon of New Zealand architecture. Athfield was interested in fragmented forms, creating spaces that would be adapted to accommodate the changing wants and needs of the occupants over time (Gatley, "Athfield Architects 43) .

The design of the GPT broke down the modern high-rise typology by combining it with familiar forms associated with the single detached dwelling. His approach was also based on a sense of place and community at a time when modern architecture consisted primarily of buildings standing alone in space (Gatley, "Long Live the Modern" 203).

The GPT comprises of a nine storey slab block

gaining its distinctive form through the circular lift core to the south, glazed laundries to the north as well as the cluster of rooftop 'houses', providing a level of domesticity. Its smaller scale additions soften the bulk of the building which would otherwise be considered a relatively large built form in its context. The range of heights and forms provoke intrigue.

Arlington One's concept unifies high-density living in human-scale and experience; a response to the surrounding urban environment.

It has been labelled as one of Wellington's most distinctive council housing schemes compared to its contemporaries whose styles takes after the international Modernist slab block (Gatley, "Long Live the Modern" 203).

FIG23 - At its completion, Arlington One was one of the council's biggest sites. Stage Two starting in the background.

SIGNIFICANT FEATURES

sig · nif · i · cance

*noun the quality of being worthy of attention;
importance*

The GPT includes many iconic elements that make it a notable Athfield-designed building including a domed lift shaft and a roof line that resembles the traditional gabled roof.

FIG24 - Breaking the building down, the GPT is a modern slab block building with additional forms to generate curiosity and familiarity by reducing the perceived scale.

FIG25 - Various significant elements that make up the GPT.

TOWER IN A VILLAGE

A low-rise medium-density village closely surrounds the tower, differing to typical developments of its time. Sloped site created intermediate streets forming a village ensemble.

STAIRWELLS AND LIFT SHAFT

Its east façade includes four concrete stairwells and a lift tower the protrude out.

STREETS IN THE SKY

Streets in the sky - or the open access galleries are a common aspect of modernist slab block housing schemes.

SILHOUETTE

A domed lift tower on the southern side is the highest point with subsequent gabled roofs and ventilation outlets staggered down towards the north to form its distinctive roof silhouette.

GLAZED LAUNDRIES

Protruding glass-house forms that are braced off the northern façade and that internally provide common laundry spaces.

GEOMETRIES

Varied geometries used for openings and penetrations seen in the stairwells and the arched entrances.

EAST ELEVATION

East elevation defines the Tower. Depth is articulated through the set back of the dwellings on gallery levels.

ROOF FORMS

Familiar gabled roof forms of the traditional New Zealand house articulate and break down the roof plane into a more intricate arrangement.

MATERIAL PALETTE

A simple raw material palette consisting of painted concrete finish with exposed concrete block work.

^^
FIG26 - Trellick (above) and Balfron Towers (below) with their architect,
 Ernő Goldfinger

>
FIG27 - GPT's design is alike to Trellick and Balfron Towers.

CRITICISM

stig · ma

noun a mark of disgrace associated with a particular circumstance, quality, or person

By its completion in 1976, the GPT scrutinised with respected architect, Gerard Melling branding it a "*crushing concrete monster*" ("Designscape 21). Media criticism of the complex has also contributed to public negativity towards it over the years.

Deaths and violent activity have been reported at Arlington. Coupled with its earthquake risk, this has heightened public awareness of the complex. The way the media outline and illustrate the facts at Arlington has exacerbated the stigma associated with the complex. Likewise, at RHG vandalism and delinquent behaviour in its early days left a sour opinion on the building for years to come.

This prejudice towards social housing and modern architecture is not uncommon. In the United Kingdom, many commentators have condemned

post-war public housing for its experimental vision, use of new technology and impact on social behaviours leading to its failure.

There is a need today to assess the ongoing value of these types of buildings, in order to distinguish between problems that stem from the architecture versus management of these estates.

"While the fall of Pruitt-Igoe in 1972 may not...have heralded the death of Modernism, it certainly marked a turning point in the fortunes of technocratic, high-density, high-rise, social-housing schemes. In the wake of Pruitt-Igoe's destruction, many countries began to look for alternatives, and the destiny of numerous Modernist estates would follow the Pruitt-Igoe pattern." (Ayers)

FIG28 - Collection of media reports on the GPT. >

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Athfield tower block could face demolition

HANK SCHOUTEN

Last updated 05:00 17/12/2012

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One of Wellington's most distinctive council housing blocks, the Ian Athfield-designed Arlington Tower, may have to be demolished because it is earthquake-prone.

The block, which features some Athfield flourishes including three big glassed communal laundry areas braced off one wall, has been assessed as meeting just 25 per cent of the new building standards.

Strengthening and refurbishment could cost as much as knocking it down and putting up a new block, said Wellington City Council property and housing director Greg Orchard.

Four years ago the council estimated that upgrading the tower was going to cost \$20 million.

Mr Orchard said a decision on the future of the Mount Cook building would be made next year but, in the interim, the council would be acting on engineering advice to brace the stairways to ensure they did not collapse in a big quake.

The building, which has been yellow stickered, is the last of the council's big housing blocks identified in 2008 as requiring major upgrade work.

"It was always going to be the last in our 10-year upgrade programme." He said there were a number of problems with the block. The lifts stopped only on every second floor, and the 77 units were small. It had 42 bedsits, 22 one-bedroom apartments and two two-bedroom apartments.

Modifications proposed included reducing the number of bedsit units, improving access and building another lift shaft, providing extra outdoor spaces, including new balconies, and incorporating sustainable design features. "We are looking at what our residents are like," Mr Orchard said.

News Headlines

- 4.4 magnitude earthquake rattles Wellington
- Student loan borrowers seeking bankruptcy as millions in debts wiped due to insolvency
- Bizarre statistics around beehive thefts - where are all the hives?
- Man mugged on Lower Hutt street
- Residents claim kids played in P-contaminated goods dumped on Waiaruaema lawn
- Z launches recycling scheme to turn coffee cups into compost
- Bidding war pushes modest Island Bay beach bungalow close to \$1m - \$315k over RV
- Cat suffers horrific injuries in school holiday slug gun attack
- Tensions rising between mountain bikers and walkers on Wellington's trails
- Disborne District Council looks at turning city's old jail into a surfing museum
- I firmly believe it will make its way back, says gallery owner whose pounamu was stolen
- Man found guilty of groping boys in Palmerston North and Wellington mosques
- Honeymooner killed in Wairarapa road crash 'wanted to see the stars'
- Let men quashed for assaulting two Berhaim women: home detention imposed

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Tenders sought for council housing rebuild

Last updated 13:50 22/07/2014

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A major social housing redevelopment in Wellington needs a design and builder - as well as someone to knock down the old buildings.

The right to design and build the first stage of the replacement for the Arlington Apartments has been put out for tender by Wellington City Council.

Expressions of interest documents for phase one of the redevelopment project, focused on the units between Taranaki and Hanley Streets, were released last week.

The council is looking for someone to come in and design, manufacture and build 114 flats based on modular housing for the site.

The project is funded by a \$33m grant from the Housing Upgrade Project (HUP), a joint \$220m venture signed between the council and Crown in 2008.

The council is keen to use modular housing, an increasingly popular method of pre-fabricated construction, attracted by the speed and relatively cheap cost of building, as well as its flexibility.

The existing 675-bed concrete complex dates from the 1970s and the council has described it as outdated, in need of proper insulation and too small for some tenants.

Business Headlines

- Bizarre statistics around beehive thefts - Where are all the hives?
- WorldSkills competition a chance for young trades to show skills
- \$1 coal mines turn to jackpots as China's cuts drive price rally
- Is there a chance New Zealand's power grid could shut down?
- Filmy Liquorland named the best franchise in New Zealand
- H&M opening expected to attract line of 1000 shoppers
- Inner city living answer for Hamilton's dying CBD
- Shumbeel Equib: The march towards insularism and isolationism
- Mike O'Donnell: Electric vehicle take-up fund should go supernova
- Five NZ Post buildings go under the hammer
- What might Donald Trump be hiding in those tax returns he won't disclose?
- Bidding war pushes modest Island Bay beach bungalow close to \$1m - \$315k over RV
- Nelson Ma'a Bridge Street building up for sale
- Airline rivalry to benefit flyers in coming months

Dominion Post Headlines

- Residents claim kids played in P-contaminated goods dumped on Waiaruaema lawn

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Quake concern for distinctive tower

HANK SCHOUTEN

Last updated 13:42 14/12/2012

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Strengthening and refurbishing the quake-prone Arlington Tower building would cost about as much as rebuilding it, council says.

Commercial Property

One of Wellington's most distinctive council housing blocks, the Ian

Business Headlines

- Bizarre statistics around beehive thefts - Where are all the hives?
- WorldSkills competition a chance for young trades to show skills
- \$1 coal mines turn to jackpots as China's cuts drive price rally
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- H&M opening expected to attract line of 1000 shoppers
- Inner city living answer for Hamilton's dying CBD
- Shumbeel Equib: The march towards insularism and isolationism
- Mike O'Donnell: Electric vehicle take-up fund should go supernova
- Five NZ Post buildings go under the hammer
- What might Donald Trump be hiding in those tax returns he won't disclose?
- Bidding war pushes modest Island Bay beach bungalow close to \$1m - \$315k over RV
- Nelson Ma'a Bridge Street building up for sale
- Airline rivalry to benefit flyers in coming months

Dominion Post Headlines

- Residents claim kids played in P-contaminated goods dumped on Waiaruaema lawn

Police investigate Wellington death

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Police investigate Wellington death

Last updated 12:31 11/08/2011

Facebook 0 Twitter G+1 Share

DEATH: Emergency services outside the Arlington Apartments in Hopper Street, Wellington.

Police and fire investigators are carrying out a scene examination at an apartment building in Hopper St, Wellington, where a man's body was discovered after a fire last night.

national headlines

- Funeral for 19-year-old Lucas Cochrane who went missing in Whitianga
- More thunder and lightning on the way, bursts of heavy rain and westerlies
- Residents at odds as replanted pohutukawa ripped out on coastal street
- Residents claim kids played in P-contaminated goods dumped on Waiaruaema lawn
- Thundersome hit Otago, reports highway underwater
- Revelers gather for Kaitiaki Seafest
- H&M opens first store in New Zealand to more than 1000 fashion fans
- 4.4 magnitude earthquake rattles Wellington
- Royal New Zealand Navy White Ensign flying above Auckland Harbour Bridge
- Sex boost sinks Waikato University candidate
- Student loan borrowers seeking bankruptcy as millions in debts wiped due to insolvency
- We should be taking more about baby loss: Don't let it be the elephant in the room
- Bizarre statistics around beehive thefts - where are all the hives?
- Man mugged on Lower Hutt street

stuff headlines

- 4.4 magnitude earthquake rattles Wellington
- Climate change ushers in doom for coffee
- Sex boost sinks Waikato University candidate
- After American sisters die at luxury Seychelles resort, family seeks answers
- More thunder and lightning on the way, bursts of heavy rain and westerlies
- H&M opens first store in New Zealand to more than 1000 fashion fans

THE REAL PROBLEMS

See design section for more detailed explanation of architectural problems.

Numerous critics have been scathing towards these high-density public housing models, often attributed to a combination of problems that arose over their life-span.

The initial positive intentions of the architectural design were overshadowed by the lack of safety within voids that no one took responsibility for. In addition, local authorities failed to recognise and act on the social issues in communities with high levels of unemployment and low incomes (Melon 18).

Many of these estates have become the focus of a profound social malaise. Public opinion grew that they favoured the creation of unsafe urban areas through the high levels of crime rates registered (Melon 18). Not only was crime an issue but the experimental material and failure to carry out regular servicing has also led to the incessant

degradation of these buildings (Density is Home). Today, these buildings also suffer from functional obsolescence involving dwelling dimension, diversity of uses and building densities. Advances in technology have also added to their inadequacy to provide the levels of thermal and acoustic insulation required by today's living standards.

Since the GPT was first constructed, little maintenance has been implemented by the WCC leading its current dilapidated state. Its position as public housing accommodation, resulted in social segregation of sorts. The non-permanent status of this demographic did little to help the personalisation and identification of the individual with the place.

However, like Pruitt-Igoe, the failures have often been presented as architectural but it is far beyond that (Jencks 20).

FIG29 - Collection of images as the Tower currently stands.

TWO CASE STUDIES

Park Hill and RHG are two of Britain's iconic Brutalist public housing estates. Both were designed by esteemed architects 40 years ago. Both have revelled in their successes and been condemned in equal measure. One is thriving, the other faces demolition. Their contrasting fortunes tell a story about British housing policy over the past 40 years (Wiles). These case studies offer key lessons towards the rehabilitation of the GPT as its current predicament is similar.

THE SUCCESS

PARK HILL

Sheffield, United Kingdom

ORIGINAL ARCHITECTS

Ivor Smith and Jack Lynn

ORIGINAL DESIGN & CONSTRUCTION

1957-1961

PURPOSE

Public housing for Sheffield Council

DWELLING NUMBERS

995 units

HERITAGE LISTING

1998 - Grade II Heritage Listing under the English Heritage

RENOVATION ARCHITECTS

Hawkins Brown with Studio Egret West

RENOVATION DESIGN & BUILT

2009 - current (full site estimated to be completed by 2022 at the time of writing)

The large Brutalist edifice of Park Hill started its life as a prosperous, bustling new home for council tenants inspired by Le Corbusier's Unité d'Habitation. But it soon became notorious for crime and drug problems with the building later being condemned as a concrete eyesore (Platt).

Historically important as one of Britain's first completed post-war housing schemes, it sought to redefine inner-city living and pioneered modern building techniques, as well as its infamous *streets in the sky* which aimed to recreate the community spirit of traditional streets within a high rise development. Back then it was regarded as an expression for a utopian vision of social housing, but for years it lived far from that (Platt).

Despite the complexity of the original design, its Brutalist language has polarized opinion and when the estate fell into disrepair in the 1980s its reputation was tarnished. To its detractors it represents what went wrong with social housing in Britain after the World War II. For it to succeed, the building's transformation needed to challenge

the social stigma.

When English Heritage granted Park Hill's listing, it became the largest listed structure in Europe.

Park Hill's redevelopment sought to retain the integrity of the original structure. The design maximises all of its best qualities such as the *streets in the sky*, which are now overlooked with windows from the flats to make them more sociable.

From a building conservation point of view much has changed, but Park Hill is better preserved in an altered state than not at all. For the memories and for its architecture, it has become a potential palimpsest of its earlier life. There is always a need for change, making pure preservation a rarely feasible idea and reinterpretation is a middle ground which need not imply compromise. The debates surrounding what to do with Park Hill revealed a heartening will to understand and to work with the given (Jones 93).

FIG30 - Brutalist repetition of Park Hill as it was with crumbling concrete.

FIG31 - Extent of Park Hill Estate as originally designed and built.

FIG32 - Infamous *streets in the sky* as they were intended to operate at the time.

FIG33 - Both old and new designs of Park Hill adjacent to each other.

THE FAILURE

ROBIN HOOD GARDENS

London, United Kingdom

ARCHITECT

Peter and Alison Smithson

DESIGNED & CONSTRUCTION PERIOD

1964, 1972-1976

PURPOSE

Public housing for Tower of Hamlets Council

DWELLING NUMBERS

213 units with a mixture of single-storey apartments and two storey maisonettes

Whilst Park Hill may have had some fortune in being listed, saved from demolition and regenerated, the same cannot be said about another Brutalist icon, the RHG. The council estate at the time embodied a different vision for a new form of social housing that has been critiqued over the last four decades.

Serious denial in upkeep has made RHG a less desirable place to live, provoking the determined council and local developers to demolish and replace the 214 social housing flats with up to 1,500 new homes (Wiles).

Notable architects such as Richard Rogers and Zaha Hadid vouched for its protection, but English Heritage have twice denied its listing. In justifying the refusal, they dwelt on the various forms of failure in social and design terms. That stigma and discontent belonged to a distant past. Vandalism and drug dealing was a relatively new phenomenon at the time - something quite clearly removed from the design of the flats. Today, there is little sign of graffiti or vandalism - just a well

looked after sense of place (Powers, 20).

Catherine Croft, director of the Twentieth Century Society, believes that the building has potential to be refurbished, at a much lower cost than the current plan to demolish and replace it. Demolition would be an enormous waste of materials as well as the obliteration of an important chapter in architectural history (qtd. in Powers 19).

Alan Powers speculates reasoning for demolition doesn't pertain to the inherent value of the building or the costs, but simply, it does not meet the economic density for housing in today's terms (25). In addition, land in London is becoming increasingly valuable and if the large piece of land could be sold to a developer, freeing up money for the council to spend elsewhere. Money for refurbishment is much harder for the council to obtain than it is for them to sell the site to a developer (Powers 25).

FIGX35 - Artist impression of RHG's inevitable fate to be demolished as it has failed to be listed, again. >

FIG36 - Conceptual sectional sketch of RHG illustrating the building's important relationship to the central green area.

FIG37 - Endless snaking of the building adjacent to the park with public walkway as it stands today.

FIG38 - Proposed replacement scheme designed by Haworth Tompkins showing the desire to increase density in this area breaking down the building mass.

FIG39 - East building of RHG looking onto the central communal garden, protecting it from the surrounding heavy traffic routes.

FIG40 - Artist impression of the completely renovated Park Hill, Sheffield.

FIG41 - Barbican Centre

Urban location has contributed to RHG's inevitable demolition as the surrounding area is under the redevelopment. It is also the prejudice and disinterest from the local council and other external parties which has led to the demise of RHG.

Estates like Park Hill, both Balfron and Trellick Towers and the Barbican Centre are examples of successful renovations that are now thriving, becoming part of the high standard housing market in Britain. Their triumphs pertain to transforming their original public housing status and with a "right-to-buy" policy. These developments have since established a more permanent population (Melon 21).

The GPT draws many parallels from the above case studies from its initial design through to its problems. Its transformation should follow suit with the elimination of community segregation. It can be an opportunity to restructure the established social networks, thus a potential to create a mixed environment.

ANOTHER CASE STUDY

The French architects Lacaton, Vassal and Drûot have practiced in problematic Parisian suburbs and their study, *Plus⁵*, demonstrates that the budget for demolition can be invested in a much more suitable way, including economic profit.

They propose a constructive, typological and programmatic renovation of dysfunctional buildings from the inside out: partition walls and façades are removed, lightweight structure balconies and *winter gardens* are added and transparent communal spaces are created on the ground floor.

These technical changes to the architecture provide insight into the redesign of the GPT which can have the ability to transform the character of the neighbourhood. Through this, the previously depressed area is re-activated (Melon 19).

FIG42 - Previous condition of Tour Bois-le-Prêtre.

FIG43 - Completed renovation of Tour Bois-le-Prêtre demonstrates the transformation of the building through the additions of *winter gardens* on all façades.

CASE STUDY SUMMARY

PARK HILL

The Success

- Regeneration of Park Hill retained the rhythm and structure that contributed to the character
- Reconfigured unit layout responded to the street deck, re-establishing passive surveillance
- New amenity such as increasing fenestration created spaces with more light and views towards the outside
- Reintroduced diverse programme at ground level to reactive the space as well as returning back to the original design
- Addition of colour contrasts to the existing Brutalist style, bringing life to the building

TOUR BOIS-LE-PRÊTRE

The Success

- The re-design was minimally invasive, employing open floor plans for flexible living spaces
- Additions of the winter gardens increase the insulation in winter and in tandem with the balcony, provide shade in summer
- Renovation successfully increase energy performance – for considerably less investment than demolition/reconstruction (Ayers)
- Proved that transforming can be cost effective, at the same time, not displacing the current residents

ROBIN HOOD GARDENS

The Failure

- Local council, who own the property are determined to demolish it and increase the density
- Location surrounding the site is part of a regeneration programme as accommodation in London expands and land increases in value
- Surrounding roads also cause issues, cutting off access to the site and creating an isolated island
- Prejudice towards the building that belonged in the past, but has not been forgotten
- Yet, the building is still structurally sound, and units are more generous than housing that is built by today's standards (Powers 33)

THE DESIGN

Throughout this document, all existing plans and section are in grey and additions are noted in black unless otherwise specified.

FIG44 - Existing aerial showing the extent of Arlington One and the George Porter Tower.

FIG45 - Proposed site aerial of the renovated George Porter Tower.

FIG46 - Existing east elevation.

FIG47 - Proposed east elevation.

FIG48 - Existing west elevation.

FIG49 - Proposed west elevation with the addition of *winter gardens*.

— — — — —

FIG50 - Existing north elevation.

FIG51 - Proposed north elevation.

FIG52 - Existing section through the George Porter Tower.

FIG53 - Proposed section through the George Porter Tower.

FIG54 - Existing site plan with plentiful car parking.

FIG55 - Proposed site plan with reformed external ground and arcades.

KEY

- 1 GEORGE PORTER TOWER
- 2 LOW RISE VILLAGE OF ARLINGTON ONE
- 3 CAR PARK
- 4 ARLINGTON TWO

ARLINGTON STREET

HOPPER STREET

FIG56 - Existing ground floor plan with multiple entrances.

FIG57 - Proposed ground floor plan with introduction of shops and other amenities.

KEY

- 1 ENTRANCE & LOBBY
- 2 LIFT
- 3 STAIR
- 4 MAIL LOBBY
- 5 RETAIL
- 6 ARCADE
- 7 OUTDOOR TERRACE
- 8 RUBBISH AREA
- 9 CAR PARK

KEY

- 1 ACCESS GALLERY
- 2 LIFT
- 3 STAIR
- 4 SHARED LAUNDRY
- 5 BEDSITTING UNIT

FIG58 - Existing typical non-access floor plan with bedsitting units.

KEY

- 1 ACCESS GALLERY
- 2 LIFT
- 3 STAIR
- 4 SHARED LAUNDRY
- 5 GREEN HOUSE
- 6 STUDIO UNIT
- 7 MAISONETTE

FIG59 - Proposed typical access floor plan, showing a combination of both studio units and lower floor of two bedroom maisonettes.

KEY

- 1 ONE BEDROOM UNIT
- 2 LIFT
- 3 STAIR
- 4 BALCONY

FIG60 - Existing typical non-access floor plan with bedsitting and one bedroom units.

FIG61 - Proposed typical non-access floor plan, showing a combination of studios and one bedroom units and upper floor of two bedroom maisonettes.

KEY	
1	ACCESS GALLERY
2	LIFT
3	STAIR
4	STUDIO UNIT
5	MAISONETTE
6	ONE BEDROOM

FIG62 - Existing view of the George Porter Tower from Hopper and Arlington Streets.

FIG63 - View from the corner of Hopper and Arlington Streets of the renovated George Porter Tower.

FIG64 - Existing neglected external ground conditions.

FIG65 - Proposed external ground condition with introduction of shops and reforming of the entrance off the street.

FIG66 - Existing view of access gallery in a run-down state.

FIG67 - Proposed view of access gallery with shared space added.

FIG68 - Existing view of laundry condition.

FIG69 - Proposed view through laundry and green garden area.

FIG70 - Existing roof top view.

FIG71 - Proposed view through rooftop demonstrating occupation with views over village and Wellington.

FIG72 - Existing view of besitting unit.

FIG73 - Proposed view through studio unit with views out towards the village.

FIG74 - Existing section through units.

FIG75 - Proposed sections through different units.

UNRAVELLING THE DESIGN

1.0 CONTEXT

2.0 MORPHOLOGY

3.0 COM

COMMONS

4.0 ACCESS

5.0 DWELLING

FIG76 - The five layers of research and design. [^]

EXISTING SITE OBSERVATIONS

Existing site observation explores the current conditions of The Site and are analysed to extract problematic areas. Iterative designs and the final design outcome are a response to the existing site observations.

CASE STUDY

Case studies are analysed throughout the thesis to illustrate different influences and positions. Case studies may be reference in numerous instances in relation to different aspects of design. A summary can be found at the appendices.

ITERATIONS

Design iterations and preliminary work that informed the final design outcome are described where relevant. These give insight into the development of certain aspects of the final design and the lessons learnt.

DESIGN OUTCOME

Design outcome informed by various iterations are selected to achieve living patrimony. The final design outcomes are highlighted throughout each of the five layers of exploration.

FIG77 - Diagram illustrates how to read the *Unravelling the Design* section

ISSUES IDENTIFIED

1.1 ACCESS TO SITE

difficulty in access

1.2 GROUND ACTIVITY

lack of

1.3 RELATIONSHIP WITH THE VILLAGE

disconnection

1.4 CONNECTIONS

to the wider context

<

FIG78 - View of low-rise Arlington One village with the GPT in the background, nicknamed *noddy-like town* by Gerard Melling.

FIG79 - Collection of site conditions.

CONTEXT • SUMMARY

The importance of the surrounding condition are paramount in the success of this building. Not only does *Context* relate to the immediate environment, but also its wider connection and placement within the city.

Montaner discusses the importance of urban location in the positive or negative evolution of a place and its capacity to be connected to its environment (12).

Through establishing connections, the building can play more of a part in the surrounding neighbourhood, and can become a focal point for residents and the public. Discussion of this will be addressed throughout.

Bertram considers the specific groups who frequent it and in fact appropriate such space that impart that space its specific character (67).

REFORM
GROUND ACTIVITY

IMPROVE
VILLAGE RELATIONSHIP

IMPROVE
WIDER CONNECTIONS

SIGNIFICANCE

The initial vision for Arlington One and the GPT demonstrated a village-like aspect. Its design, combined a tower surrounded by a village of low-rising dwellings breaks the typical high-density typology, where towers in an anonymous park-like setting were more prevalent.

The initial placement of the Tower shielded the village from the adjacent industrial sites at the time. These sites have since developed into residential as the city expanded.

Although it is important to regenerate the building, contextual relationship and the surrounding space must also be considered. Spatial dialogue is pivotal as building are not always an autonomous structure. The context encompassing the building also contributes its function and significance (Dunnett 173). In the case of both Trellick and Balfron Towers, only the buildings were listed, thus the spaces around these buildings are becoming increasingly vulnerable to encroachment. This crucial factor must be considered for the regeneration of the GPT.

Urban location plays a significant part in the rehabilitation of a place and can define whether it succeeds or fails. The GPT is located on the edge of Wellington's CBD. Its connection to the city is paramount, being situated just off main arterial transport routes, nearby to places of work and other amenities.

FIG80 - Original site plan of Arlington One and the GPT
with proposed site landscaping.

Arlington Street.

Thick shrub planting for privacy

Concrete and Asphalt paved surfaces
as shown on Plan No 2/30/L/3

Sidney Street.

1.1 SITE ACCESS

IMPROVE

The placement of the Tower does not respond to the surrounding natural topography.

Whilst Hopper Street maintains its incline southward, the site of Arlington One has been flattened to its lowest point, thus creating complication for access on its eastern boundary.

FIG81 - Steep topography of Arlington One.

^
>
FIG82 - The site design did not consider its steep topography. By flattening only the Tower side, with steep topography elsewhere, it has resulted in a lot of steps, complicating pedestrian access.

^
FIG83 - Little effort has been made to create better access down to the site with pedestrians having to navigate down a small dirt bank. Unlandscaped areas, coupled with an immediate arrival to parked cars, are a deterrent.

FIG84 - Diagram illustrating how change of levels can aid in passive interaction.

FIG85 - By raising the ground, access to the site can be right off the footpath, creating better flow.

FIG86 - Edge treatment offer spaces for occupation, rather than turning people away.

FIG87 - Increased access from both Hopper and Arlington Street enlivens the street to site edge.

Site access can be improved from the road and footpath through the use of terracing and steps.

Raising the ground to create more transparent access through the site and better permeability would result in more people walking through the site.

1.2 GROUND ACTIVITY

The ground level area surrounding the building is monopolised by vehicle parking.

It is lacking in usable space for residents to enjoy as too much space has been dedicated to car parking.

>

FIG88 - Car parks dominate the base of the building. The area is barely occupied by pedestrians leaving as a desolate space.

V V

FIG89 - Access to Arlington from Hopper Street is obstructed by cars parked at the base, close to the entrances.

In order to activate this area for both residents of Arlington and the wider public, amenity and articulation of space is required.

Through encouraging more activity at ground level, passive surveillance is also introduced mitigating wayward behaviour and increasing security.

< ^
FIG90 - Neglected shared space located around the base of the Tower.

FIG91 - Base of the tower is surrounded by an oversupply of car parks. Most of the time, parks are surplus to requirements.

FIG92 - Revised replacement of car parks strengthens pedestrian activity throughout the site.

With its close proximity to the city, reduction of vehicle usage is encouraged in preference for alternatives such as public transport, cycling or walking - thus the requirement to have a car lessens. Studies carried out by the WCC also demonstrate that residents living in the CBD tend to walk from home to work and to carry out other day to day activities (51).

In response to the sloping site - terracing of outdoor spaces create more permeable pedestrian flow throughout the site.

It also breaks up vast area into smaller spaces that can be used for a number of different activities, creating different levels of privacy and exposure.

FIGX93 - Varied levels provide opportunity for each space to be used differently and occupied by different people.

<<

FIG94 - Public spaces have been successfully designed around the Lincoln Centre and the Alice Tully Hall allowing pedestrians to walk through the space and provide a space to meet people to sit and mingle

Stairs act as transitory spaces between the street and the building itself, offering a shared place.

FIG95 - Placement of the park here strengthens pedestrian activity through the site.

FIG96 - Varied levels provide opportunity for each space to be used different and occupied by different people.

Bertram encourages examination of how access can be facilitated in open space. Access, accessibility and alternative opportunities are critical as to how open or exclusive a place may be. Access, therefore is a social and pragmatic matter.

C

The placement of the tower creates potential for a park to surround the base of the building, providing amenity for residents and neighbouring area.

Successful examples of urban parks seen at RHG and Heller Street open up interaction between residents - fostering neighbourliness. The parks at these sites are treated as public areas.

FIG97 - Landscaped form at RHG situated between the two buildings providing garden space for children to play whilst still in view of family members.

FIG98 - Park outside Heller Street Apartments. Children make use of the public park adjacent to the houses.

1.3 RELATIONSHIP WITH VILLAGE

IMPROVE

E

The Tower was designed to shield the village from the neighbouring industrial sites, thus creating a non-permeable building that doesn't allow easy access to the village from the street.

By providing more permeability at ground level through the Tower, the internal courtyard can support greater connection to the village.

^

FIG99 - When it was first built, the eastern boundary was confronted by an industrial zone and the 'Hopper Street Whopper' was seen as a positive barrier enclosing and protecting the low rise village behind it (Melling 21).

<<

FIG100 - Close proximity between tower and village.

^

FIG101 - The Tower forms such a massive and immediate backdrop to the village that it becomes more a threat to the villagers than the unpleasantness of the industrial activity it shields (Melling 21).

The articulation and design of humanly-scaled high-rises have been difficult to achieve. More often than not, they have failed than succeeded. (Melling 21). The design of the RHG, intended to protect an inner urban landscape from surrounding busy highways. However it eventually enclosed and isolated it from its context (*see FIG39*).

^
FIG102 - Inner courtyard between the Tower and Village, but due to the placement of adjacent buildings, permeability is complicated.

^
FIG103 - Removal of two buildings in the village creates a spatial buffer between the low-rise village and the Tower, so that the latter is not such a polarising backdrop.

^
FIG104 - Provision for an inner residents courtyard has been generated through the removal of the adjacent buildings.

FIG105 - Additions of the *winter garden* allows for occupation at the edge ensuring passive surveillance of the grounds surrounding the building.

FIG106 - The boundary wall becomes a space where residents can withdraw to, with heightened awareness of their relationship to the village and beyond.

Bertram observes that activities in private spaces are not all equally private, and softer permeable interfaces may create more interstitial or transitional spaces where internal activities can be seen from the outside (97).

1.4 WIDER CONNECTIONS

IMPROVE

Montaner discusses the importance of connection contributing to the positive or negative evolution of a place; access to facilities and green spaces, its capacity to be connected to the surrounding environment which has been disastrous for RHG (Montaner 12).

As Arlington is located within close proximity to Cuba Street, secondary and tertiary institutions as well as the arterial public transport network which can be a hub to the surrounding community.

FIG107 - Map of Arlington and its wider context illustrating proximity to surrounding amenities.

FIG108 - Elevation up Hopper Street.

^^

FIG109 - Vast blank tower walls have a deadening effect on street life and atmosphere acting more as a deterrent and do not invite people to enter the building.

^

FIG110 - Extent of anonymous walls facing Hopper Street creating an insular building.

^^

FIG111 - Replacing the redundant services previously located at the base of the Tower created an opportunity to cut out arcades, providing access to penetrate through to the village unobstructed.

FIG112 - An example of a laneway in Melbourne that connects two pedestrian routes with smaller shops that encroach into the street

FIG113 - Imperial Lane was designed to provide connection between Queen Street and smaller, Fort Lane in Auckland

FIG114 - Chews Lane which runs beneath an apartment complex, with cafés and retail at ground level provides a short cut for pedestrians as well as amenities

C Laneways and arcades have been successful in connecting two larger streets. Their compactness creates atmospheric, transient spaces whilst forming a short cut. Shops and cafés spill out onto the lane, activating the space. This design feature will offer solutions for visual permeability at the GPT. The inclusion of windows and doorways suggests human presence, enriching the public realm.

FIG115 - Proposed section through site with view through arcade at ground level demonstrating permeability through the site and better site access from Hopper Street to the low-rise village.

The proposed arcades establish a connection between the Tower and village. By introducing shops and a café, residents and passers-by are provided with amenities, activating a once deadened space whilst also increasing liveability.

<<

FIG116 - Introducing shops at ground level provides amenity and draws more foot traffic to the site increasing activity.

FIG117 - Frontages can reach out to the street and be active on public space, adding life and vitality.

▲ ▲

FIG118 - Views into the building provide interest to passers-by while views out, puts eyes onto the street contributing to its safety.

ISSUES IDENTIFIED

2.1 ORGANISATION
building organisation and distribution

2.2 STRUCTURE
lateral resistance

2.3 FORMS
unique flourishes

2.4 MATERIALITY
material palette and performance

2.5 SPATIAL CONDITIONS
atmosphere & environment

<

FIG119 - Typical Athfield-styled geometries of the Tower.

FIG120 - Collection of images of the building forms.

MORPHOLOGY • SUMMARY

Morphology addresses the stylistic and formal aspects of the design, building form, organisation, materiality and spatial conditions.

Morphology examines the general spatial arrangement and uses the existing significant building forms to rearrange and introduce new functions. It also explores the tactile conditions that create spaces throughout the building.

The initial design of the GPT aimed to create distinction of functional spaces within quirky forms that are stylistically important of an Athfield design. *Morphology* continues on this theme, by doing so, it seeks to acknowledge its past designer.

REPAIR
BUILDING FORMS

REPAIR
MATERIALITY

IMPROVE
SPATIAL CONDITIONS

SIGNIFICANCE

The GPT's form and silhouette are examples of Athfield's distinctive style. Gatley believed that the sculptural style applied to the typical modernist slab block is a design unique to both Wellington and New Zealand. She argues for the conservation of it due to this form ("Athfield Architects" 68).

The significance of this building is derived from key elements:

- the striking and unique roof line - consisting of a domed top to the lift tower and familiar gabled roofs of New Zealand homes. The elements both break up the monolithic perceptions of the Tower whilst playing on the nostalgia of home.
- three protruding glasshouse-like structures on the northern façade - most noticeable when approaching the building from the city. These unusual transparent structures allow the internal program of the building to be perceived from the outside.
- natural colour scheme - reminiscence of the Mediterranean architecture for which Athfield displayed a fondness for, allowing the sculptural form to become the main focus.

All elements, very uniquely independent, are combined to create the playful, unusual and intricate forms Athfield is renowned for.

FIG121 - Structure of the GPT - of cast in-situ concrete and concrete block work.

2.1 ORGANISATION

IMPROVE

Overall form of the building is a typical slab block with additional flourishes that are archetypal of the Athfield style.

Through the various forms, there is opportunity to both revitalise and add to existing amenity. The unique forms can aid in the overall organisation of the building.

Due to the vertical nature of the existing building, a vertical mixed-use typology can be applied. This model has developed naturally from the days when business owners had their homes above their shops. These days the uses above ground are often office spaces and apartments.

FIG125 - Existing organisation of the GPT.

FIG126 - Proposed new organisation, introducing more amenity.

A vertical mixed-use typology is more suited to town centres areas where street-based retail and commercial activity is encouraged to create lively and active street edges. It also allows for other common amenities to filter throughout the building, seen in larger buildings such as Unité see *Commons* for narrative.

2.2 STRUCTURE

IMPROVE

Today, the structure of the GPT is failing. Deteriorating concrete conditions in New Zealand are detrimental as it weakens their ability to resist lateral forces.

In 2008, the building's structure was assessed by local engineering firm Dunning Thornton Consultants. They found the building's seismic rating as approximately 25% of the NBS its longitudinal direction and exceeding well over 100% of the NBS in the transverse direction.

This resulted in its 'yellow stickered' rating by WCC. By 2023, the building should either be demolished or repaired to meet the necessary building standards of today.

FIG127 - Multiple penetrations in the supporting longitudinal walls have further weakened the buildings ability to resist lateral loads such as earthquakes.

TYPICAL ACCESS PLAN

TYPICAL NON-ACCESS PLAN

FIG128 - Existing floor plans illustrating a single shear wall supporting the building in the longitudinal direction compared to the nine in the transverse direction.

FIG129 - Initial exploration into appropriate structural addition to strengthen the existing building. Various iterations tested the impact that the new structure would have on the overall appearance of the building and different scales.

FIG130 - Short and long elevation illustrating new structure with existing building. Subtle steel frame tied into the existing building on the western façade is the most appropriate due to its minimally invasive appearance and ability to blend in but still offer the support required to withstand lateral loads.

FIG131 - Exploded axonometric demonstrating relationship between existing building and new structure.

TYPICAL ACCESS PLAN

TYPICAL NON-ACCESS PLAN

FIG132 - Proposed new structure reinforcing the longitudinal direction through the insertion of steel moment frames tied into existing structure on the east and west façades.

FIG133 - New supporting structure creates provision for *winter gardens* on the less articulated western façade aligning with existing unit grid.

FIG134 - Slender steel structure allows for uninterrupted views from unit through *winter garden* additions.

FIG135 - Before and after of Tour Bois-le-Prêtre, demonstrating the effect of adding on an encompassing structure.

2.3 FORMS, EXISTING REPAIR

The roof, laundry and protruding stairwells contribute to the distinctive silhouette of the building. Over the years, they have endured damage with some having been demolished.

It is important to repair the unique forms of the GPT to maintain its authenticity as an Athfield designed building.

FIG136 - Existing roof has safety measures put in place, leaving the space under utilised and deteriorating.

FIG137 - Repurposing the roof with a better programme and making it safer to occupy.

FIG138 - Existing condition with one glazed form missing due to fire damage.

FIG139 - Reinstating third glazed form and improving their liveability and capitalising on its northern orientation, creating sun-drenched spaces.

Repairing the laundry would create better natural ventilation, improving its liveability and habitability. See *Commons* for further discussion.

FIG140 - Deteriorating stairwells have left them in unpleasant conditions.

FIG141 - Incorporating glazing and mesh encloses stairwells while achieving maximum natural lighting and weather protecting. At the same time it minimises sensory nuisances.

FIG142 - Pulling stairwell out creates a freer access gallery. Addition of new steel moment frames on east façade required to strengthen the building provoked a change to the existing stairwell structure and appearance.

FIG143 - Reconditioning provides an opportunity for stairwells to be re-articulated as new forms and further enhances their expression.

2.3 FORMS, NEW

Improvements and additions are required as part of the building's rehabilitation. The challenge is how best to incorporate new elements with the existing building in order to add to the architectural significance, rather than taking away from it.

ADD ON

SEPARATED

AMALGAMATION

FIG145 - The add-on entrance to Keeling House contrasts in both form and material to the existing building. Its relationship is superficial, not necessarily interconnected. Although different, the entrance is sympathetic to its surrounds

FIG146 - Glass pyramids at the Louvre provide a distinctive difference between the existing building. The Louvre is a collection of three different buildings and the intervention was designed to collect visitors at a single point and redistributes them below ground.

FIG147 - Entrance to the Royal Ontario Museum uses a striking and polarising form to distinguish from its existing building. It utilises an amalgamating technique where the new and the old intermingle with each other.

2.4 MATERIALITY

REPAIR

Like many other modern buildings, it embraced the technological and material advances of the time but unforeseen problems later arose. Together with years of poor maintenance has lead to its rapid deterioration.

The height of modernism was infamous for its introduction of new materials and technologies. Generally, their longevity had not been explored sufficiently at the time.

Spalling concrete conditions are as a result of movement in the building but also potentially from the type of concrete used and made available at the time.

While Athfield buildings were typically painted in a light colour - recreating the Mediterranean - insufficient maintenance has resulted in its crude appearance today.

FIG148 - Examples of peeling paint.

FIG149 - Repairing existing condition of the concrete can also strengthen its longevity and performance.

Lacaton & Vassal is known for its 'arte povera' aesthetic. In the redesign of the Tour Bois-le-Prêtre, the architects fully committed to this signature. Using “raw-concrete floor finishes, galvanised steel railings, lacquered aluminium panels, corrugated polycarbonate glazing...” (Ayers).

This aesthetic can be applied to the interior treatment at the GPT. It proves to be sympathetic to the original design, but also does not compete with new material palette.

Whilst it is important to maintain the Ath-style, a change in material treatment marks a shift towards a new future for the building.

FIG150 - Raw concrete that has been expressed through units during the renovation of Park Hill.

FIG151 - Raw material palette that demonstrates simplicity as used by Lacaton and Vassals.

2.5 SPATIAL CONDITIONS

IMPROVE

Tectonics dictate the atmosphere of a place and how it contributes to the over conditions and occupation of the space itself.

FIG152 - Melling was critical of its west façade, characterizing it as non-human and austere in appearance (22).

FIG153 - Additions of the *winter gardens* will drastically changed the appearance of the west elevation, brining a lighter aspect to a heavy building.

FIG154 - Existing stark condition of access galleries.

FIG155 - Reformed spatial conditions of the access gallery proposed timber flooring and ceiling, transforming it from institutional to domestic in character.

Existing surfaces of the access gallery are a combination of exposed and painted concrete. Its sterile nature rebuffs occupation. Inspiration has been taken from Zumthor's Housing for the Elderly with regard to his treatment of timber, highlighting a more delightful, habitable space.

FIG156 - Housing for the Elderly utilised timber to soften the corridor for more homely atmosphere that is reminiscent of a domestic hallway.

3.0 COMMONS

spaces and amenities shared by residents

ISSUES IDENTIFIED

3.1 STREETS

interaction between neighbours

3.2 WASHING

communal laundry facilities

3.3 ROOFTOP

unused potential

<

FIG157 - Courtyard with community centre in the foreground.

FIG158 - Collection of images of current common space conditions.

COMMONS • SUMMARY

Common space is crucial in high-density living situation as it provides relief from individual units. It is often the kind of space required to connect private dwelling and the public realm, thus establishing neighbourly interactions.

A frequent critique of apartment living is the separation and segregating of private and shared spaces between residents. Thus residents are isolated and social engagement is few and far between.

By looking to the past, the Smithsons' sought to bring back social aspects when they manifested the *streets in the sky* notion. The *Commons* section uses this idea, and builds upon that. Through exploring ways in which shared spaces can provide different amenity to residents, it provides greater choice and opportunity to overlap and interact and breaks the tendency to retreat inside ones individual unit.

PUBLIC

Open to or shared by everyone. Spaces that are not private - freely accessible to everyone.

COMMON

Spaces that might be shared by a more exclusive pool of people.

PRIVATE

For the use of a particular person or group, free from interruptions of others.

NEIGHBOURLINESS

The ability to enhance/foster social interactions between two or more people or groups of people.

REFORM
ACCESS GALLERIES

REPAIR
LAUNDRY

REFORM
ROOFTOP

SIGNIFICANCE

The *streets in the sky* have been an important aspect of many high-density post-war housing developments and its inclusion at the GPT seemed like an obvious choice because of its slab block design.

In the case of the RHG, the *streets* were designed to be much wider to allow for milk delivery carts, groups of people to pass each other or stop and converse and for children to play. The wider access deck became an outdoor extension of the home and a social space that is neither fully private nor fully public, which happened to be appropriate for the needs of its residents (Powers 33).

The GPT's access galleries are narrow and bleak compared to its international counterparts and do not foster the same sorts of activities.

It is an important design feature for the Tower, that provides a distinct horizontal expression further strengthened by the set backs and overhangs which Athfield added to the overall appearance of the east façade.

FIG159 - Artist illustration of the watchful eye of the GPT over Arlington One. >

FIG160 - Tower to Village relationship. >>

FIG161 - Vertical mixed-use allows for people to live, work, play and shop in one place, creating a destination for the neighbourhood.

Unité's boldness consists of its social implementations. The most interesting experiment in the design was to locate the shopping centre on the central floor of the building. On the seventeenth floor, a nursery for children and a ramp leads directly to the roof terrace that includes a swimming pool and running track.

Taking precedence from the planning of Unité, communal facilities at the GPT could be scattered throughout the building both vertically and horizontally. This allows the cross over between communal and private spaces, this adding to the life and vitality of the building.

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3.1 STREETS REFORM

The access galleries at the GPT are too narrow to foster any sort of social interaction between neighbours. Its grim nature and poor relationship to units make the spaces unfavourable.

To enhance the area, exemplary precedents like Park Hill and RHG included accesses which were wide enough for multiple people to talk or borrow space for their own.

Hans Scharoun describes the gallery as a space for living and socialization rather than a mundane access and circulation element (qtd in Heckman 40).

FIG162 - Narrow walkways at the GPT occur at every third level to access units.

FIG163 - Close proximity to units make it difficult for two people to stop and talk, or walk past each other.

FIG164 - *Streets in the sky* at RHG when it was first built, demonstrating how it was envisaged to be occupied with residents borrowing space from the access as a 'front porch' and fostering interaction.

FIG165 - The neighbourly act of interaction occurring on a *street deck* at Park Hill.

The Smithsons' sought to bring back a social aspect with the *streets in the sky*, recreating the vibrant atmosphere of the small streets of Britain. Their inclusion in the unsuccessful Golden Lane competition, RHG, and Park Hill, made deck-access approach world renowned with varying degrees of success.

RHG ultimately revealed the limitations of the *streets in the sky*. Due to the sheer number of units and the exposure to noises of the high-traffic surrounding - the galleries proved to be inhospitable and anonymous. Despite this, the spatial relationship between the housing units and gallery are nevertheless exemplary (Heckmann 40)

The increased width of access galleries allows for two people to pass and engage with each other. However, it is imperative to maintain levels of privacy between residents.

A lack of distinction between shared and private space could contribute to areas left unused. A hierarchy needs to be established for sense of ownership.

While unavoidable in the given circumstances, improving the GPT's access should also take this into account.

AA

FIG166 - Front doors are in close proximity access, opening into circulation path effecting privacy.

C

FIG167 - Streets deck at RHG where individual units have made use of the wide access deck, occupying it like they would a front porch with plants and seating.

FIG168 - Access gallery with planter and water feature pulling circulation away from entrances to units creating a threshold for privacy.

FIG169 - Design explorations of different use of planters to create a buffer for privacy and draw circulation away from edge of front doors to units. Thus solution requires residents to maintain planter boxes and also does not create a lot of flexibility of using this space.

FIG170 - Exploring how to revitalise the *streets in the sky* to foster interaction between dwelling, residents and passer-bys.

FIG171 - Houses by Make Architecture demonstrates that through the articulation of the fenestrations, lingering at the edge can occur.

Providing the interface between public and private realms, the edge of the public space enables interaction and protects privacy.

The wall, door and window is therefore a threshold, dividing space and establishing new relationships.

FIG172 - Creating pockets of common space for residents to claim space - this exploration looks into how to introduce the street atmosphere using the lane way design approach where circulation is a secondary factor to how space is occupied.

Bertram notes that circulation space is frequently classified and treated separate from usable space. However if a corridor is thought of as simply a room giving access to other rooms, then other possibilities for its use, shape and role open up (116).

FIG156 - Zumthor's Housing for the Elderly demonstrates how shared access can be used as an extension of the home. The space is more casual allowing residents to place furniture and plants for personalisation.

FIG173 - View of street with added width showing social interactions between neighbours . The wider space allows users to borrow and share the additional space whilst crossing over with circulation, therefore interaction (Bertram 115)

FIG174 - Widening the walkway allows residents to borrow space, taking ownership of the space interfacing with the public realm, instead of strictly establishing privacy. This encourages interaction, while providing an option for privacy.

FIG175 - Section through unit and access gallery demonstrating access being used as borrowed space by units, for example, in this case, for entertaining guests.

The success of multi-use circulation space will not be achieved by simply widening access and declaring it “communal”. It is achieved by defining pockets of private spaces that directly adjoin circulation, setting up a footpath-to-front-porch connection. This is similar to interactions that occur where cafés spill out onto the street and passer-bys can interact with people sitting down if they so wish.

3.2 LAUNDRY REPAIR

Similar to many other buildings of its time, the GPT provided communal amenities like laundry units, housed in three protruding glass forms on the northern façade.

It was a design feature to encourage residents to bump into each other. But as with many aspects within this building, insufficient maintenance and surveillance has led to their downfall.

After a fire broke out in one of the units, it was demolished and only two are left standing today.

FIG176 - Current conditions are unattractive, leading to many residents choosing not to use the common facilities.

FIG177 - Exploration into activating access gallery further by establishing a horizontal magnet with repaired laundries at northern end and refuse chute at the other - generating activity, with more opportunity for residents to bump into each other.

Opportunities to bump into neighbours began to decline in the twentieth-century with the internalisation of laundry facilities (Cockayne). Through providing varied communal spaces, residents are encouraged not retreat within their dwellings, but extend out into other areas of the building.

FIG178 - Facing washing tubs opposite each other facilitates social interaction when two or more people are occupying the laundry.

FIG179 - Two spaces can be closed off, or kept open by pushing back the pivot doors. The green house provides residents with an elevated, sheltered garden area for resting, relaxing and gardening - a unique feature for apartment living.

Potentially, Athfield tried to foster interaction by designing communal laundries. The original drawings show allocated seating spaces to encourage lingering but these were subsequently removed.

By maintaining communal laundries instead of privatising them, they continue to promote contact between neighbours.

FIG180 - Removing one unit at the northern end opens up opportunity for laundry units to expand. Introducing green houses into the glazed forms and moving the laundry into the unit, optimises its northern orientation.

3.3 ROOFTOP REFORM

Originally designed with two larger units at roof level, the remaining area of GPT's roof was dedicated to mechanical services and drying laundry. This has since been closed off due to the unsafe nature of the roof.

Wellington's often unfavourable weather conditions typically do not allow the unsheltered roof to be used and enjoyed by residents. Crucially, the rehabilitation of the roof requires divisions into better usable space.

FIG181 - Opportunity to revitalise unused roof space with immense potential to offer residents great views over Wellington.

FIG182 - Establishment of a vertical magnet draws people up the building, provoking pedestrian activity.

FIG183 - Proposed condition of roof top, breaking down and separating spaces for different activities.

Treatment of the roof top at The Commons breaks a relatively large, flat area into smaller diverse facilities for the residents. A combination of an enclosed laundry room, along with green space for gardening and barbeque area cultivates a social interface among residents. This approach ensures options for residents to both use and enjoy.

Similar tactics can be applied to the roof of the GPT that is in dire need of refinement in order for its reformation.

FIG184 - Spaces are divided into fully enclosed and semi-enclosed areas that offer residents the option of different levels of occupation.

Introducing of office spaces and a shared semi-enclosed roof garden with kitchen facilities gives residents of the GPT alternative options outside of their dwellings to inhabit. These new features will add constant movement of people vertically adds to passive surveillance throughout the building. The design concept draws upon strategies employed at The Commons.

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4.0 ACCESS

vertical and horizontal paths of movement within and around the building

GEORGE PORTER TOWERS

ISSUES IDENTIFIED

4.1 VARIOUS & VULNERABLE
multiple entrances

4.2 VERTICAL
stairwells & lift

4.3 HORIZONTAL
streets in the sky

4.4 INDIVIDUAL
unit access

<

FIG185 - Existing exposed entrance conditions to GPT.

FIG186 - Collection of access conditions.

ACCESS • SUMMARY

For high-density living to function well, good access is vital. Access controls and manages intimacy while allowing for diverse ways of living in such close proximity to others.

Oliver Heckman describes access as the path from the public to the private sphere. Its interstitial nature can promote or discourage encounters among neighbours, and be experienced as inviting or hostile. Access spaces is a spatial and social buffer between anonymous public space and the intimate individual environment of the residents.

Thresholds also play a key part in establishing relationships between private and public space. *Access* is explored through both physical and intangible forms. Circulation potentials are exploited beyond their functional aspects.

IMPROVE
VERTICAL ACCESS

REFORM
HORIZONTAL ACCESS

IMPROVE
UNIT ACCESS

SIGNIFICANCE

The design of the GPT puts emphasis on vertical and horizontal circulation articulated through the buildings' forms. It includes a detached lift tower, as well as four external stairwells providing access vertically throughout the building.

Like many of its international counterparts, the GPT incorporates the infamous open access galleries, commonly known in modern architecture as *street decks* or *streets in the sky*. They provide horizontal access to units - a conventional circulation method in high-density housing during the post-war period. This allowed for buildings such as RHG and Park Hill to expand laterally, resulting in much longer buildings whilst maintaining the desired density of the time.

The *street decks* at the GPT are located on the street facing elevation. Years of neglect and exposure to the elements has left the narrow galleries in poor condition. It is an undesirable spaces which much be traversed before entering into the home.

FIG187 - East elevation articulated by vertical and horizontal circulation forms. >

east.

4.1 VARIOUS & VULNERABLE REFORM

Entrances to the Tower are not clearly defined to the public. There are more than five ways to access the building. Multiple entrances cause confusion, and their exposed nature impacts on the privacy of the residents.

Similar problems were evident at Keeling House when it was constructed, and it was not until the building's regeneration that the architects established a distinctive formal entrance foyer.

FIG188 - Unenclosed access at ground level to stairwells leaves units and residents vulnerable to any passer-by.

FIG189 - Multiple entrances are highlighted.

FIG190 - Defined entrance to the Trellick Tower from the street providing both clarity and a layer of security.

FIG145 - New entrance lobby at Keeling House provide users with an interstitial space, mediating between public and private space.

Vestibules therefore can act as a physical threshold, providing moment of tension that provokes and re-establishes relationships between individuals, groups and the public. It mediates between spaces and allows extension to occur. (Bertram 87)

FIG192 - Location of entrance selected as it was easily visible and accessible from various points on the site.

FIG193 - Consolidating multiple entrances into an internalised lobby enables surveillance mechanisms and greater control of people entering the building.

It is important to clearly define the entrance to the building as visitors approaching can orientate their way to the destination. It also establishes an identity for the building from the street.

Their exposed nature of entrances at the GPT gives unrestricted entry to the building thus compromising residents safety.

Its fundamental problem is the absence of a physical threshold to defines what is publicly accessible and what is for residents only. The lack of a public to private threshold is a real issue. It impacts on residents' security, and opens up the building to vagrants and loiterers affecting residents comfort.

A design solution to consolidate all access to one point of entrance, and at the same time, introducing a physical barrier, delineating that point of entrance.

FIG194 - Open access from south car park to the GPT's lift tower.

FIG195 - Exposed stairwell entrance condition.

FIG196 - Reforming and redirecting the building entrance enables control over access and circulation. The lobby will operate as a spatial and social buffer between public space and the intimate individual environments of residents.

FIG197 - Enclosed lobby offers a sheltered and secure place for mail boxes - offering security for residents is paramount especially in these closed and shared quarters.

4.2 VERTICAL IMPROVE

Stairwells at the GPT have also been left exposed. Wellington's adverse weather conditions, coupled with lack of maintenance has resulted in deteriorating surfaces leaving spaces impoverished.

Stairwells are bleak with little light penetration, hindering visibility and creating entrapment zones.

Improving existing stairwells through enclosing them protects them from the weather, also enhancing natural light.

FIG198 - Existing stairwell drawings.

FIG199 - Existing stairwell showing solid concrete fins on either side that obstruct views.

D

FIG200 - Through the addition of a new structural frame on the eastern façade, it offers the opportunity to create translucent and enclosed stairwells. View shafts towards surrounding context is established.

FIG201 - Modifications to the stairwell establishes passive surveillance. The new translucent stairwells enables residents to oversee activity on the access galleries, dwellings and vice versa.

4.3 HORIZONTAL REFORM

Horizontal access at GPT incorporates the modernist *streets in the sky* phenomenon widely used throughout international mass-housing schemes.

The *street deck* was an alternative to the narrow internal corridors Le Corbusier used at Unité, where the former created spaces for children to play and foster social interactions between neighbours.

At the GPT, the *street decks* are not as wide as their contemporaries so two people passing each other do not have space to stop and talk, and a lack of public versus private thresholds causes occupational issues.

FIG202 - Deteriorated condition of the access gallery of the GPT as it is today show how little iteration there is between private units and shared access.

FIG203 - Existing sketch width at GPT, demonstrating its narrowness

Efficiency dictates that access should occupy as little area as possible, resulting in many public housing cases that resulted in access spaces that were spatially, functionally and qualitatively impoverished (Heckman 37).

FIG204 - Collection of initial *streets in the sky* studies. It explores different forms of access galleries, and how that might be applied to the GPT to improve its conditions.

Double height galleries and level changes weren't viable options due to their impact on the overall building.

FIG205 - The Smithsons' unsuccessful Golden Lane competition of 1952 polemically described the 'street in the air', and they claimed that with their innovation 'a new dimension has been added to the life of high-density living' (Murphy). The decks, described as yard gardens, provide contact between residents and those passing and see-through views made the building less massive (Powers 31).

Widening the access proved to be a viable option to improve the current conditions. However its width is critical in whether social interactions are established, or the space becomes anonymous and unused.

FIG206 - Exploration into increasing width of access gallery at GPT by 500mm increments and the impact the width can have on using this as shared space.

Urban theorist, Jan Gehl, states the distance between people in shared space is linked to the programme and size of the space. ‘A very conscious use of distances is involved in nearly all contacts. The distance between participants is reduced if mutual interest and intensity are increased’ (67). The ease of being at close proximity to others adjusts accordingly with the size and use of the space.

4.4 INDIVIDUAL IMPROVE

As it stands, access to units is either straight off stairwells or in the way of circulation on *street deck* level which hinders the residents privacy.

By introducing a vestibule for each units' front door, it creates a sense of entrance and a defined zone. Similar benefits as for a building but for an individual dwelling.

FIG207 - Existing condition of the entrances to unit. Images show the close proximity of the door to the stair and opening doors onto a narrow gallery also makes it difficult to navigate around.

C **FIG208** - The unit entrances are set perpendicular into a niche-like space. Thus further enhancing the entrance area. Door mats aren't kicked aside by passer-bys and pot plants and other belongings are able to be left in front for personalisation.

FIG209 - Exploration into changing orientation of front doors. The perpendicular access creates a threshold between shared access and private units derived from RHG. Though this achieves privacy in a way, there is still a disconnect between shared access and dwellings.

"The physical experience at the threshold extends and focuses on the brief moment between inside and out, the space between public and private" (Bertram 87)

FIG210 - Returning front doors to being parallel to the access allows for direct access from units to *streets in the sky*. It also enables dwellings to extend into the shared access gallery.

Although privacy for front doors and nooks is not achieved to the extent of previous iterations - this iteration allows units to have a better relationship with the access, encouraging lingering at the edge, therefore activating the spaces with levels of interaction between neighbours. This relationship is important for residents claiming spaces from the streets for their own use which is discussed further in the *Commons* and *Dwelling* section.

Providing the interface between shared and private realms, the edge of the shared space needs to enable interaction and protect privacy. The wall and door therefore are partly a boundary setting, subdividing space and establishing new relationships between the two sides.

FIG211 - Shoji screens that are commonly used throughout Japan provide a layer of privacy filtration, whilst still providing light diffusion. They can obscure or reveal views into and out of the dwelling.

Applying this technique to the GPT will establish a softer, more permeable interface between shared and private realms.

FIG212 - Collection of exploration into suitable door type.

Articulation of access to units is also important as this defines how units can have a relationship to the *streets in the sky* as well as its success.

Exploration into the physical threshold by using hinged door, sliders or bi-folds. Observations proved that sliders were the best option, being minimally invasive on either space as well as controlling levels of openness.

FIG213 - Sliders demonstrating levels of openness and connection to access gallery.

FIG214 - View from inside dwelling. Translucent sliders provide visual permeability to the access - residents now have a level of awareness of their neighbours.

Architecture cannot determine whether spirit of neighbourliness exists in a place but it can have a strong influence. Things that contribute to influencing it are; materiality, spaces between dwellings and configuration of living arrangements

All these factors affect the ways people are accessible, audible and visible to their neighbours (Cockayne 3).

5.0 DWELLING

*the residential unit, its internal layout and relationship to other
units, public and common areas*

ISSUES IDENTIFIED

5.1 DIVERSITY

unit types

5.2 OUTDOOR

lack of

5.3 LAYOUT

poor relationship

5.4 AMENITY

useful feature or facility

<

FIG215 - Western elevation of various dwellings.

FIG216 - Collection of current images of dwelling conditions.

DWELLING • SUMMARY

The standardisation and layout of dwellings in modern high-density housing leaves little room for personalisation and flexibility. Their redevelopment is critical to the success of meeting today's living requirements.

Dwelling is explored through flexible living areas and its ability to borrow from adjacent spaces. Through looking at each individual units' arrangement and how they relate to one another, both identity and neighbourliness can be fostered.

Bertram notes through breaking functional separations, spaces without ambiguous purpose can promote sharing and borrowing, hence interaction is achieved.

REFORM
OUTDOOR SPACES

IMPROVE
SPATIAL LAYOUT

IMPROVE
AMENITY

SIGNIFICANCE

A combination of mostly bedsits and one bedroom dwellings make up a large portion of the GPT. The standardisation of unit types allowed the building to be designed within a regular structural grid. This was typical of many modern slab block designs and the cell type units could be repeated many times to meet density demands.

Similar to major contemporaries like RHG, units in the GPT were planned with minimum wastage of space. Everything was well dimensioned and the requirements of living for public housing tenants at the time were catered for. As a result, the allocation of space has left units in a rigid configuration that does not allow for the flexible demands of today's private dwellers.

GPT flats are only one deep allowing for maximum light penetration into the units much akin to RHG and both Balfron and Trelick Towers. This is distinctive of the slab block typology that departs from the Corbusian model, seen at Unité.

FIG217 - Front to back units at RHG with direct access from *streets in the sky*. Similar design execution has been carried out at the GPT.

FIG218 - Le Corbusier created interlocking units at Unité reducing the number of required corridors and also allowing units to be naturally lit from both ends.

5.1 DIVERSITY REFORM

E

The Tower has 77 units, of which, 42 are bedsits, 33 are one bedroom and two are two bedroom units. This configuration is now perceived as inadequate for the current demands with one and two bedroom apartments more commonly found in high-density living (WCC Survey 71).

FIG219 - Existing floor plans of bedsitting
Floor area: 29m²

FIG220 - Existing one bedroom units.
Floor area: 40m²

FIG221 - Exploration into different unit types.

FIG222 - Experimenting into diversity of dwelling type. Conclusions drawn, for a minimally invasive approach that aligns with the modernist planning approach, it is imperative to maintain units within the existing structural grid. Three bedrooms and larger dwellings were abandoned as studies by the WCC show there is less demand for these in central city living (71).

^^

FIG223 - Proposed studio unit.
Floor area: 39m²

^

FIG224 - Proposed one bedroom.
Floor area: 50m²

>

FIG225 - Proposed two bedroom maisonette.
Floor area: 75m²

Development of the maisonette arose from the need to include more diversity of dwelling type. This offers an opportunity to have two bedroom units, taking advantage of the existing access galleries.

By internalising stairwells in some units, it opens up the provision to have two bedroom maisonettes with living accessed off the street and more private bedrooms on the storey above.

5.2 OUTDOOR SPACE REFORM

An unusable balcony is a commonly occurring problem in high-density housing. Currently over half of Wellington apartments have either no outdoor space or a small balcony (WCC).

The obvious lack of inhabitation among these small Wellington balconies proves that their size and environmental conditions renders them as unpleasant and unusable spaces.

A survey carried out by the WCC shows that residents still have desire to access private outdoor spaces in apartments and contributes to their main reason for relocation to the suburbs (74).

FIG226 - Allocation of balconies are scattered, leaving a majority of dwellings without access to outdoor space. The ones that do, even then, have limited habitability.

FIG227 - Jardin d'hiver or *winter gardens* that were successful in the alteration of Tour Bois-le-Prêtre as an alternative to the balcony. Sliding doors open up to extend the apartment. This strategy is fitting for the GPT where weather conditions restrict access to private balconies. *Winter garden* space can be used at all times of the year like a traditional conservatory or sun room

The addition of the steel structure not only provides adequate earthquake strengthening, but it also gives way for the existing units to be extended from their current envelope. Wellington is susceptible to unpredictable weather conditions, *winter gardens* have been selected as an appropriate means of providing outdoor space to all units.

Their ability to be used all year round is suitable for Wellington. There is provision for them to be opened up, forming an outdoor balcony of sorts.

FIG228 - Diagram demonstrates how *winter garden* is added to existing units.

FIG229 - The overall visual effect of the addition of *winter gardens* to all units on the western façade. Occupation at the edge can occur with residents being able look over the village below.

FIG230 - Application of *winter gardens* to the west façade creates habitable outdoor/indoor space at all times of the year whilst also allowing more light to penetrate into the units. This method makes the most of the existing building orientation and the afternoon sun.

FIG231 - *Winter gardens* are an extension of the dwelling with the ability to improve thermal comfort, accumulating heat in the winter.

FIG232 - Ideas above demonstrates how the application of a tilt door is a suitable option for the opening apparatus. When opened, a fixed pane of glass forms a balustrade and the tilt door disappears up in the ceiling to creating an open balcony.

FIG233 - A tilt door is employed the Commons to maximise space. When open, the balcony becomes an extension of the living space for uninterrupted flow and views.

FIG234 - Sliding doors are suitable for compact living spaces as they take up minimal room and can offer large openings, varying degrees of privacy as well as better flow through spaces.

FIG235 - View of *winter gardens* through unit towards the *street deck* with sliding doors open maximising full dwelling area.

5.3 SPATIAL LAYOUT

IMPROVE

E

Layout of spaces was dictated by the living demands of the time. This has generated precise spaces that worked well in the first instance but have been difficult to adapt to new activities and habits.

Living spaces were arranged further away from the front door, thus a disconnection between dwelling and access gallery. Whilst the lobby and bathroom act as a privacy buffer, there is also a separation between residents and the shared access.

FIG236 - Existing floor plan of bedsitting unit at the access level. Front doors opens into lobby space with bathroom adjacent.

^^

FIG237 - View from inside dwelling towards front door illustrating isolation and no awareness of the outside.

^

FIG238 - Cellular planning of dwelling.

WCC councillor Greg Orchard perceived the existing units as small (qtd. in Schouten). Today there is often a preoccupation with quantity over quality which accounts for the flabbiness we often see in new house plans from the "if in doubt, add more" school of thought. Architect, Kerstin Thompson believes that skilful planning extracts plenty of amenity via the compact arrangement of modest floor areas ("Boldly Petite").

^
FIG239 - Collection of images of existing units highlighting their compact living spaces.

FIG240 - Entrance hall and stairs create a disconnection between *street deck* and living spaces at Park Hill.

FIG241 - Illustrated section through units at RHG, again, stairwell and hallway separate living spaces from *street deck*.

C A critique of the *streets in the sky* concept was their limited relationship to the units. Evident at RHG, Park Hill and the GPT alike, units are isolated from the *street deck* where private living areas were located further away from front doors. While this idea had privacy in mind, the disconnection between the two spaces doesn't establish the interaction as the Smithsons' had intended to.

At Park Hill, the internal layouts of the units were renovated so that hallway and landing windows looked out onto the street, providing passive surveillance.

FIG242 - Collection of exploration into the organisation of spaces that could allow residents to borrow from *street deck*.
It is critical to create a flexible living space at the threshold.

FIG243 - Placement of formal bedroom cuts off the living area from the gallery therefore not enabling flow onto the shared space.

Organisation of studio units was the most critical as they had the least floor area.

FIG244 - Organisation of private to more public spaces within a dwelling in relation to access galley. Services are located adjacent to the stairwells, thus freeing up flexible living space and providing a better relationship with the *streets in the sky*.

Planning takes the long, narrow units and situates fixed services on one side and the more flexible living spaces on the other with circulation to flow in between.

More private living spaces are organised towards the west of the units to make use of addition of *winter gardens* and providing flexible living spaces adjacent to the *street deck* to provoke interaction.

FIG245 - The bedroom location and how it functions is critical. The bed is placed closer to the access so when it is not in use, it can be folded up into the wall. The space can then be used for other activities.

Bedrooms typically are a dedicated space, used primarily for sleeping at night but during the day, the space is used infrequently. By rethinking the way bedrooms are allocated in smaller living areas, there is opportunity to create more flexible, unprescribed spaces.

"Ambiguous, non prescriptive spaces are more flexible than specific single-use spaces as yet unimagined activities can more easily be accommodated" (Bertram 116).

FIG246 - A studio unit at Cairo Flats where the 'small' living spaces have been renovated with built-in joinery unit that allow a bed to be folded up, freeing up space for other activities when not in use.

Floor area of units - 24m²

TWO BEDROOM MAISONETTE

ONE BEDROOM UNIT

FIG247 - The units layout used the organisation from the studio can be applied to the maisonette in an expanded version. It will create a more generous living area off the *street deck*. Bedrooms are located on the storey above.

5.4 AMENITY

IMPROVE

FIG248 - Existing fenestrations are deteriorating, making them difficult to open; coupled with their small size, they require updating.

FIG249 - Providing larger fenestrations to units will allow for more natural lighting.

FIG250 - Existing view through bedsitting unit with a small window, preventing natural light thus making the space feel much smaller.

FIG251 - Floor to ceiling windows and doors will reduce the perception of the compact living space as well as increasing the visual aspects.

FIG252 - Successful tighter floor plan of Upper House, utilises higher stud heights, and larger windows and doors. It creates more light penetration, therefore reducing the perception of the smaller floor area. Applying this technique at the GPT, where increasing stud heights are not feasible, will make the living spaces appear far more generous.

LIGHT AND VENTILATION

Lewis Mumford criticised the long, narrow units of the Unité d'Habitation for being too thin, but as Charles Jencks argues, they allow for cross ventilation and cut down harsh sunlight (qtd. in Jencks 15; 18).

The GPT units' current living areas are not very well lit or ventilated. Improving the size and locations of the fenestrations can encourage cross ventilation through individual units.

Open plan living also lends itself better to improving natural light penetration and ventilation which lessens the need for mechanical means, thereby reducing energy consumption.

FIG253 - Existing small fenestrations do not allow for much cross ventilation to occur.

FIG254 - When open, tilt door in the *winter garden* can control natural airflow right through the unit and when closed up, it can trap heat creating warm, sunny spaces in winter.

FITTINGS

Fittings have not been upgraded since it was first built. Currently these functional elements contribute little to the practicality of the units. Tired and outdated, they need to be refreshed and updated to compete with contemporary private apartments.

FIG255 - Original bathrooms included a bath, toilet and vanity - it was uncommon to have showers back then.

FIG256 - The upgraded bathrooms opt for a shower instead of a bath, providing a level of accessibility. All other fittings are to be replaced.

FIG257 - Existing kitchen area is typically closed off into a small area with dated kitchen amenities and no mechanical extraction.

FIG258 - The modifications it allows and open kitchen that integrates better with adjacent living spaces thus creating a freer floor plan.

FIG259 - Elongated layout of kitchen and bathroom allows all services to be located along one wall to create open living, making better use of tighter floor areas.

FIG260 - Above diagrams demonstrates bed being open and how the bed can be folded up. This optimises space in tight living situations creating a flexible living area. It also provides extra storage spaces in tighter living situations.

C

FIG261 - Joinery unit allowed for multi use space which can be applied to studio units at the GPT who shares similar floor area.

THE INHERITED

CONCLUSION

ex · e · ge · sis

noun critical explanation or interpretation of a text

This thesis explored the validity of modern high-density public housing models both locally and internationally, to act as living patrimony.

It looked into the objectives of:

- The future possibilities of New Zealand's existing retired housing
- The adaptive re-use of our valued built heritage

The research has explored their intrinsic heritage significance and their potential to aid in the current housing crisis making it both a housing project and a heritage project. This thesis has provided lessons for both these areas of interest.

Whilst there are major social and cultural benefits in retaining existing building fabric of heritage significance, cost and resources to rehabilitate them are more complex. This research has primarily focused on the architectural qualities. However the practical realities of cost, funding, construction period and resources are crucial to establishing whether this proposal is feasible. The biggest challenge in retaining these buildings is willingness, vision and funding, without that, these modern high-density housing models could be forgotten.

Using the George Porter Tower to test the design approach, the resulting design proposes to redevelop a fatigued building. It recognises the successes and failures and heritage through five layers of research: context, morphology, common, access and dwelling. This builds on both John Allan and Charlotte Stephens research where three levels of intervention were implemented. Repairing, improving and reforming the five layers strike balance is struck between preservation, conservation and improvement of these modern buildings.

Transformation of these buildings to meet current high-density lifestyles is achieved through the use of additional structure, overlapping of spaces and reconfiguration of layout. The most radical shift between existing and proposed is the design of multivalent spaces to borrow and share from, resulting in users taking control and ownership.

This not only generates high quality living spaces but also questions the conventional norms of apartment buildings.

The key consequences of the design are as follows:

- A more flexible living space that provides a more relevant layout for users of today whilst being respectful of the modernist approach to the standardisation of unit.
- Additional amenities outside of the dwelling generates more movement and interaction building upon Athfield's ideas of community living.
- Common spaces to share and borrow from enables private dwellings to extend into a shared domain further enabling community living.
- Additional elements added to the overall form of the building improve functionality but still allow the unique style of Athfield's design to remain central focus.

The resulting design maintains, interacts and improves the significant playful forms of Athfield's original design along with his early principles for community living. By working with the existing model, idealistic modernist approaches that would often not be considered in today's design, such as *streets in the sky*, communal facilities and standardisation of spaces play a central role. The rehabilitation of the building addresses those ideals and expands on them - seeking to solve their issues with today's knowledge and principles. Thus, ensuring reconciliation between the past and present. This builds on his ethos that architecture is a process of continual growth, enabling buildings of heritage significance to play a key part in cities of today.

>
FIG262 - The GPT at dusk.

THE FUTURE

for · ward

noun towards the future

This design-based research has focused on the reconditioning of public housing models as living patrimony, but the relevance of the methodology can be applied to other types of projects of varying scales and form. The context of different sites would offer a different response to design - but the underlying principles and levels of intervention would remain the same for any project.

This design research also drawn crucial attention to the public housing stock in New Zealand challenging assumptions and stereotypes. It also increases awareness and provokes discussion which may help to foster greater emotional attachment and care for these properties. *Secondhand Architecture* is certainly a strategy worth exploring by parties who would be interested in maintaining heritage values rather than developing the places in such ways as to compromise their significance. This is a real consideration for local councils and central governments who own these buildings. Fundamental to the success of *Secondhand Architecture*, is a shift from public housing to privatisation, where ownership and care fall on the individual - not relying on building managers. Through integration of mixed social class, along with the right-to-buy, it establishes a diverse and permanent population to form a positive identity.

Secondhand Architecture supports the recycling of modern heritage, and this model has presented high potential to achieve the demands of a growing city; negotiating with what already exists and offers an alternative approach to demolition. This thesis asserts that these modern high-density public housing models are important to not only architectural history but also to the development and evolution of a city - it can be part of the story for the living future, as living patrimony.

APPENDICES

LIST OF CASE STUDIES

in order of appearance

abbreviations

A architect

OD original designed date

RD renovation design date (if applicable)

INTRODUCTION

Barbican Centre
London, United Kingdom
A. Chamberlain, Powell and Bon
OD. 1976

1.0 CONTEXT

Alice Tully Hall
New York, United States of America
A. Diller Scofidio + Renfro
RD. 2009

Lincoln Centre
New York, United States of America
A. Diller Scofidio + Renfro
OD. 2010

Heller Street
Melbourne, Australia
A. Six Degrees Architects
OD. 2011

Imperial Lane
Auckland, New Zealand
A. Fearon Hay Architects
OD. 2011

Chews Lane
Wellington, New Zealand
A. Athfield Architects
OD. 2009

2.0 MORPHOLOGY

Tour Bois-le-Prêtre
Paris, France
A. Lacaton, Vassals and Drûot
OD. 1960s
RD. 2011

Keeling House
London, United Kingdom
A. Denys Lasdun
OD. 1957
RD. 2001

Musée du Louvre Pyramids
Paris, France
A. I.M. Pei
OD. 1989

Royal Ontario Museum
Ontario, Canada
A. Daniel Libeskind
OD. 2007

Cité Manifeste
Mulhouse, France
A. Lacaton, Vassals and Drûot
OD. 2005

Housing for the Elderly
Graubünden, Switzerland
A. Peter Zumthor
OD. 1993

Charles David Keeling Apartments
California, United States of America
A. Kieran Timberlake Architects
OD. 2011

3.0 COMMON

Local House
Melbourne, Australia
A. Make Architecture
OD. 2014

Rosebank House
Kew, Australia
A. Make Architecture
OD. 2014

Unité d'Habitation
Marseille, France
A. Le Corbusier
OD. 1952

The Commons
Melbourne, Australia
A. Breathe Architects
OD. 2011

4.0 ACCESS

Golden Lane Housing Proposal (*unbuilt*)
London, United Kingdom
A. Peter and Alison Smithson
OD. 1952

5.0 DWELLING

Cairo Flats
Melbourne, Australia
A. Acheson Best Overend
OD. 1936

Upper House
Melbourne, Australia
A. Jackson Clement Burrows
OD. 2015

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FIG17 - Athfield, Ian. Arlington One Site Aerial.

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FIG19 - Athfield, Ian. Sommes Island Housing Scheme.

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FIG22 - Athfield, Ian. Arlington One Site Aerial. Wellington.

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Source: <<http://brutalism.online/features/municipal-dreams/419-the-park-hill-estate-sheffield-streets-in-the-sky>>

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FIG165 - Lynn, Jack and Ivor Smith. Park Hill Streets in the Sky.. Sheffield.

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FIG167 - Smithson, Peter and Alison. Streets in the Sky of RHG. London.

Source: <http://polinice.org/wp-content/uploads/2015/04/RobinHoodGardens_7.jpg>

FIG168 - Apartment. Auckland.

Source: < <http://www.aucklanddesignmanual.co.nz/project-type/buildings-and-sites/housing/apartments/guidance/site-design/design-for-topography#/project-type/buildings-and-sites/housing/apartments/guidance/the-building/Apartment-building-types/apartment-building-types-basic-forms>>

FIG171 - Make Architecture. Houses. Melbourne.

Source: <<http://www.makearchitecture.com.au>>

FIG183 - Breathe Architecture. The Commons Melbourne.

Source: <http://www.architectureanddesign.com.au/getmedia/6c405459-3be5-4169-affe-fc4f9a18aa1d/141023_Commons3.asp>

FIG187 - George Porter Tower Elevation Drawing.

Source: Wellington City Council Archives.

FIG190 - Goldfinger, Erno. Trellick Tower. London.

Source: < <http://www.coolplaces.co.uk/places/uk/england/london/notting-hill/6226-trellick-tower>>

FIG198 - George Porter Tower Stairwell Drawing.

Source: Wellington City Council Archives.

FIG205 - Smithson, Peter and Alison. Golden Lane Housing Proposal.

Source: <<https://canstudio.files.wordpress.com/2014/01/http-archinect-comfeaturesarticle40475utopian-modernism-in-london-a-series-of-drifts.jpg?w=436&h=249>>

FIG208 - Smithson, Peter and Alison. Robin Hood Garden Streets in the Sky. London.

Source: <http://rmitallchange.weebly.com/uploads/1/3/2/4/13244459/186643_orig.jpg>

FIG211 - Shoji Screens.

Source: <http://cdn.homedit.com/wp-content/uploads/2014/10/ALTS_ritto_house_shoji-screens.jpg>

<<http://blog.cherrytreedesign.co>>

<<http://www.cherrytreedesign.com/assets/img/shoji-sumo-header.jpg>>

FIG217 - Smithson, Peter and Alison. Robin Hood Garden Section. London.

Source: <<https://s-media-cache-ak0.pinimg.com/736x/e5/50/5b/e5505b7a83f1670b60da128df4a9e34c.jpg>>

FIG218 - Le Corbusier, Unité d'Habitation Section through units. Marseilles.

Source: <<https://s-media-cache-ak0.pinimg.com/originals/38/ca/16/38ca16c4da1ad232ffe02397279b5dd0.jpg>>

FIG219 - George Porter Tower Bedsitting Unit Plan Drawing.

Source: Wellington City Council Archives.

FIG220 - George Porter Tower One Bedroom Unit Plan Drawing.

Source: Wellington City Council Archives.

FIG227 - Various Winter Gardens projects by Lacaton and Vassals

Source: <https://www.architectural-review.com/pictures/2000x2000fit/8/2/5/1274825_FDA_TBP_JH08__65A_Jean_Charles_94__7_.jpg>

<http://www.metalocus.es/sites/default/files/file-images/ml_03_FDA%20TBP>

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FIG233 - Breathe Architecture. The Commons. Melbourne.

Source: <https://st.hzcdn.com/simgs/2991c6e50472bdee_4-5878/deck.jpg>

FIG239 - Unit images of the George Porter Tower. Wellington.

Source: Novak+Middleton Limited.

FIG240 - RHG Unit Plan.

Source: <<http://www.pettydesign.com/2013/05/28/housing-at-the-expense-of-an-idea/>>

FIG241 - RHG Section.

Source: <http://images.adsttc.com/media/images/5038/0d79/28ba/0d59/9b00/0b68/medium_jpg/stringio.jpg?>>

FIG246 - Cairo Flats. Melbourne.

Source: <<http://assemblepapers.com.au/assemblepapers/wp-content/uploads/2014/09/>>

FIG252 - Jackon Clement Burrows. Upper House. Melbourne.

Source: <<http://architectureau.com/articles/upper-house/>>

FIG261 - Cairo Flats. Melbourne.

Source: <<http://assemblepapers.com.au/assemblepapers/wp-content/uploads/2014/09/>>

FIG261 - George Porter Tower at Dusk.

Source: Andy Spain Photography.