DIRTY LAUNDRY
The adaptive reuse of an existing building

An explanatory document submitted in partial fulfilment of the requirements of the degree of Master of Architecture (Professional)
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ABSTRACT

Whilst both adaptive reuse and sustainability are important architectural strategies in their own right, greater potential lies in their combined application, facilitating an architectural solution with the benefits of both. This research project is founded in the integration of sustainable practice in adaptive reuse and consists of two components – writing and design.

The writing component explores adaptive reuse and sustainability through a critical review of current knowledge and practice, proposes a shift in thinking that takes account of both strategies in combination; and describes and evaluates their application in the mixed-use redevelopment of an existing commercial building in the Auckland city fringe-suburb of Grey Lynn. The design component illustrates and makes explicit – in this specific redevelopment situation, and in detail – the processes, applications and implications of adaptively reusing an existing building in a sustainable manner.

Every aspect of this research project aims to raise awareness and actively portray the potential of sustainable practice in adaptive reuse as a viable and socially responsible alternative to demolition and replacement.
'It is not the strongest of the species that survive,
nor the most intelligent, but the one most responsive to change.'

Charles Darwin
Authenticity

This explanatory document has been prepared by myself, Hannah Lee Penlington, 1262672, in partial fulfilment of the requirements of the degree of Master of Architecture (Professional).

I declare that all work within this document is my own work and has been carried out in accordance with the guidelines stated in the Unitec Student Handbook 2010. Where the work or ideas presented are not my own they have been referenced in accordance with the Chicago Referencing Style, 15th edition.

Signed: Date:

Hannah Lee Penlington 30th September 2010
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It would not have been possible for me to achieve all that I have during my architectural education without the support of my partner, Mark, and my parents, Brett and Debbie. Add to that Unitec’s Department of Architecture, Tony van Raat’s enthusiasm and energy, the dedication and support of my supervisor Graeme McConchie, as well as Dave Strachan, Brendan Smith and Max Hynds, lecturers, support staff and critics. Finally I must acknowledge the guidance, support and assistance I have received from all those involved in this project Dirty Laundry. From librarians and heritage campaigners, to developers and architects themselves, there are too many to name individually, but you are far too important not to mention.

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Key Terms

**Adaptive Reuse** –
Adaptive reuse is ‘conventionally defined as the process of adapting old structures for new purposes.’¹ This is a broad strategy which includes varying levels of intervention from minor change through to commercial redevelopment. This research project primarily focuses on adaptive reuse at the larger end of the scale as a holistic strategy which looks to fulfil contemporary expectations.

**Sustainability** –
Sus.tain.able adj 1: capable of being sustained 2 a: of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged <~ techniques> <~ agriculture> b: of or relating to a lifestyle involving the use of sustainable methods <~ society> - sus.tain.abil.i.ty n (Merriam-Webster 1994)²

**Integration** –
in-te-gra-tion. noun 1. an act or instance of combining into an integral whole.
Within the context of this research project the word integration is used to reference the way in which the processes of adaptive reuse and sustainability can work together to enhance and inform each other resulting in a process of sustainable adaptive reuse.

Cultural Significance –
A historic, scientific, social or spiritual value for past, present and future generations... embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups... [and] may change as a result of the continuing history of a place. Understanding... cultural significance may change as a result of new information.3

Heritage –
The combined creations and products of nature and of man, in their entirety, that make up the environment in which we live in space and time. Heritage is a reality, a possession of the community, and a rich inheritance that may be passed on, which invites our recognition and our protection.4

Paradigm Shift -
This project explores the paradigm shifts of both adaptive reuse, sustainability and the developments in thinking which have occurred. It also explores the integration of adaptive reuse and sustainability and the need for a paradigm shift to result in wider adoption of sustainable adaptive reuse. In the context of this project a paradigm shift is interpreted as a change in thinking and philosophy, replacing a previous belief. This is a process which occurs over time and is driven by agents of change.

3 The Australia Icomos Burra Charter, (Burra: The Australia ICOMOS Burra Charter, 1999).
4 Committee on Terminology, "Quebec Association for the Interpretation of the National Heritage," (1980).
1. INTRODUCTION

'The longest journey begins with a single step.'

Chinese Proverb
Significance of this Project
This project addresses a limitation in current thinking within the New Zealand architectural profession. It is an exploration, analysis and evaluation of the practices of both adaptive reuse and sustainability in an effort to raise awareness of their potential as a sustainable development option when utilised together.

Our existing building stock plays a fundamental role in our society. It contains large quantities of embodied energy, materials and resources as well as contributing to the streetscape, character and embodied memory of our communities.

When buildings no longer meet expectations, demolition is frequently employed, contributing to the building industry as ‘the single largest consumer of resources and the single largest contributor to the waste stream.’ Demolition not only contributes to the waste flow, it squanders previously expended materials, with further energy and resources required to replace the building. It is destructive and results in the loss of a layer of our history forever. Even the most ordinary buildings play a role in the ongoing memory of society, communities and individuals. However, despite this, demolition and replacement is often sought as the primary development solution for a site with an existing building.

Whilst it is not uncommon for a building’s use to no longer meet the demands of society, it is the way in which we respond to this which can have a significant impact on our environment and the local context, both physical and cultural. Demolition and replacement can be an appropriate and necessary course of action for an existing building, depending on the situation. However, there also needs to be an insight and education into potential alternatives in order for our building stock, embodied resources, embodied memory and associated heritage to be sustained where possible. Demolition and replacement is not the only option when working with an existing building. At the other end of the spectrum lie conservation, preservation and maintenance and between these two

Adaptive reuse is a form of rehabilitation and is the focus of this project. It has many historic, environmental, social and economic benefits; all of which make it an essential component of sustainable development.

However, despite its benefits and adoption on the world scene, it is slow to be adopted in New Zealand. In order for adoption to increase, there needs to be a shift in our thinking about existing buildings and an education about the potential of what can be achieved with a new approach. Given the sustainable attributes inherent in adaptive reuse the challenge is not only how to retain and upgrade an existing building but also how to do this in a sustainable manner that meets contemporary requirements.

The significance of this project is in the intersection of adaptive reuse and sustainability, and the investigation of how they can enhance each other. Whilst there are a variety of publications on adaptive reuse and sustainability separately, there are limited resources available on the intersection of the two. As such, this research project will contribute to a field of architecture which is not currently well acknowledged.

Research Question

*How can an existing building be adaptively reused in an environmentally and socially sustainable manner to achieve a viable development alternative to demolition and replacement?*

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Project Outline
This research project explores the sustainable development potential of existing buildings as an alternative to demolition. It consists of two components, writing and design.

The writing component explores adaptive reuse and sustainability through critical review of current knowledge and practice with a view to educating and raising awareness of adaptive reuse as a sustainable and viable alternative to demolition. The design component aims to make explicit the process and application of adaptively reusing an existing building in a sustainable manner, providing evidence to further support the research.

Part A

- *Chapter 2 - Adaptive Reuse* explores the paradigm shift involved. Benefits, barriers and examples of adaptive reuse are identified and critically analysed.
- *Chapter 3 – Sustainability* investigates the evolution of sustainability and its role in the built environment.
- *Chapter 4 – The Integration of Sustainable Practice in Adaptive Reuse* explores and demonstrates the potential of implementing sustainable design practice in adaptive reuse projects, enabling both concepts to inform and enhance each other.

The writing is then followed by the design component, which aims to explicitly demonstrate the process and application of adaptive reuse. Key issues include design development, identifying alternative solutions, resolution, refinement, presentation and critique. The design project involves the development of the Former Auckland Laundry Building (referred to from here on as ‘the Laundry Building’) built in 1938 and located at 58 Surrey Crescent, Grey Lynn, into a dynamic creative precinct.
Part B

- *Chapter 5 - Site Analysis* presents a thorough investigation of the chosen building, site and context.
- *Chapter 6 – Programme* addresses the task of appropriating a new use to an existing building as well as the programme for this design project.
- *Chapter 7 – Design Strategies* presents the process and application of adaptively reusing the Laundry Building in accordance with key strategies explored.
- *Chapter 8 – Conclusion* is an evaluation of the research project including a critical appraisal and identification of further research opportunities.
- *Chapter 9 – Appendices* presents additional critical review and analysis to further support the research project.
- *Chapter 10 – Bibliography* lists the sources used in this research project.

In summary, adaptive reuse is a sustainable solution with significant potential and every stage of this research project focuses on raising the awareness of this. This is in an effort to educate key players and reduce the perceived barriers of working with existing buildings, in turn reducing the number of buildings that are demolished.
Objectives

- To explore, critically analyse and present existing knowledge and practice of adaptive reuse and sustainability.
- To discuss the integration of adaptive reuse with sustainable design practice.
- To use the findings above to develop a comprehensive design solution whereby an existing building is adaptively reused in a sustainable manner.
- To make explicit the process of adaptively reusing a redundant building to aid in the education of others.
- To demonstrate the potential of adaptive reuse as a sustainable development option and alternative to demolition and replacement.

Methodology

This project explores the intersection of two key concepts to inform design; adaptive reuse and sustainability. Whilst these are both areas of long-standing personal interest, I recognised an increased level of understanding was fundamental to the success of my project. This involved a period of initial research, which guided the design at the outset. The design then informed the need for further research and a cyclic process of research and design evolved.

This cyclic process is similar to that of the action research method, which has guided the evolution of this project. Action research originated in the 1940s through the work of Kurt Lewin, with a focus on social research. Since then it has been used across a range of disciplines including architecture, as outlined in Architectural Research Methods.7

The ‘action research’ method is a reflective process of progressive problem solving. Reflective processes, such as this, focus on identifying a problem, developing knowledge and skill, exploring how the situation can be changed or improved, implementing and monitoring the change and evaluating the evidence. Evaluation determines the level of success achieved, at which point another alternative is explored, implemented and evaluated or a new problem is identified and the process begins again. This process supports the cyclic nature of this research project and the necessity for analytical research, which continuously informs the design. It also emphasizes the importance of evaluation as a constant development tool throughout the process, not solely at the end.

The project followed the reflective process. However, due to the nature of design projects, there were multiple challenges to be worked on simultaneously. Many were ongoing and revisited throughout the project duration. Whilst many of the decisions were based on rational and rule-based propositions, there were also situations where decisions were based on professional judgement as to which option would best contribute to the overall success of the design project.

The project was critiqued throughout the year by tutors, professionals and specialists in the field. This provided ongoing opportunities for reflection and evaluation, often leading to a reassessment of chosen solutions, further exploration or the implementation and evaluation of different alternatives.

This research method allowed for a range of techniques to be used in both writing and design. Key sources included articles from the Avery and J-STOR databases; books loaned from the Unitec library, inter-loans and personal loans; recommendations from tutors, fellow students and professionals; internet websites and associated publications. Key search terms included: adaptive reuse, architectural adaptation, reuse, existing buildings, heritage, heritage protection, preservation,

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conservation, sustainability, environmental sustainability, social sustainability, sustainable technologies, architectural sustainability, building performance, building evaluation, building life cycle, climate, climate responsive architecture, passive design and creativity.

The review of current practice through precedent studies was important in informing writing and design. These are addressed in the body of the text with a more in-depth analysis of key precedents in Appendix A. These enabled a greater understanding of how similar projects have been carried out, providing an opportunity to draw comparisons and understand both the positive and negative implications of decisions. Finally, interviews and discussions were held with architects, developers, heritage campaigners, property owners, fellow students and academics.

The design explorations have been in the form of sketching (2D and 3D, bubble diagrams, master planning, detail drawings and perspectives), analysis of the existing building (measured and photographic, property and geographic details, documentary evidence and archives, structural survey and seismic testing), computer modelling (massing in context, solar shading studies, spatial composition and detail design), calculations (plot ratios and sun angles), physical modelling and hard line drawing.
2. ADAPTIVE REUSE

'It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.'

Charles Darwin
Adaptive reuse is the process of adapting old structures for new purposes.\textsuperscript{10} It has many benefits and has been acknowledged both locally and internationally as a viable development solution for a site with an existing building. Despite this, there are barriers to adaptive reuse, and, as a result, it is often not a development option that is prioritised in New Zealand.

Societies change and develop over time and it is not uncommon for a building’s use to no longer fit the community in which it stands. The dynamic nature of occupancy means that any building is unlikely to have the same intensity or type of use throughout its serviced life.\textsuperscript{11} Expectations of buildings, comfort levels and technical standards also change over time, requiring older buildings to undergo change and modernization in order to fulfil contemporary expectations.\textsuperscript{12}

Change is a characteristic inherent in buildings and this is a concept readily addressed in literature by Johannes Cramer and Stefan Breitling\textsuperscript{13}, Luis Fernandez-Galiano\textsuperscript{14} and James Douglas.\textsuperscript{15} Furthermore, Stewart Brand examines buildings in the dimension of time, noting that all buildings are forced to adapt, however some do so more gracefully than others.\textsuperscript{16}

\begin{enumerate}
\item Adaptivereuse.net, "Adaptive Reuse Contemporary Metamorphoses."
\item Ibid.
\item Douglas, \textit{Building Adaptation}, 141.
\item Stewart Brand, \textit{How Buildings Learn; What Happens after They’re Built} (New York: Penguin Group, 1994).
\end{enumerate}
Critical Review of Current Knowledge

Adaptive Reuse on the Rise

Buildings have always been modified to a certain extent and the reuse of buildings initially developed as a thread of the conservation movement. Although the adaptation of buildings is not a new process, their conversion to other uses on a regular, larger scale is a more recent phenomenon. The perception gained from literature is that internationally this paradigm shift occurred in the 1960s and 1970s. This was influenced by a growing concern for the environment as well as high fuel and material costs, making it a viable alternative to new construction.

Since then, adaptive reuse has been commonly practiced in Europe, the United States and Australia and is often a prioritised development solution.

The New Zealand Situation

Whilst the international scene saw an increase in the protection and reuse of building stock, the 1970’s and 1980’s in New Zealand saw a boom in new construction. To make way for these new developments, Auckland in particular saw an unprecedented amount of demolition.

Whilst the New Zealand Historic Places Trust and territorial authorities provide a degree of recognition and protection for historically significant buildings, there are no laws or governance in place and no level of protection for our more ordinary buildings. Demolition is often sought as the primary development solution and even historically significant buildings are at risk of demolition due to inconsistently applied protocol and a side-stepping of regulation. Protecting New Zealand’s built heritage is an ongoing challenge. However, there should be no doubt it is a worthy task with significant benefits.

Figure 2-1 The Cannery, San Francisco

'The Cannery' in San Francisco is an early example of adaptive reuse. Originally built in 1907 as a fruit and vegetable canning plant for the California Fruit Packers Association, the distinctive brick building was converted to a retail precinct in 1966. This was acclaimed as a pioneer in the adaptive reuse movement and the building previously destined for demolition, still stands today.

*About the Cannery,* Del Monte Square, http://www.thecannery.com/about/?page=hisotry

17 Douglas, Building Adaptation, 97.
19 Personal communication, heritage campaigner, Allan Matson
An overview of both the heritage and adaptive reuse situation in Auckland was provided at the Building Owners and Managers Conference ‘Keeping the Past Alive’ held in 1997. A recurring theme was that adaptive reuse offers a favourable solution with many positive outcomes.\textsuperscript{20}

The New Zealand Institute of Architects acknowledges the importance of maintaining our built environment, encouraging members to:

- adopt the ethic of doing no harm, which does not restrict architectural possibilities but challenges all architects to pursue true design excellence and accept cultural heritage as part of the distinctive attributes and constraints that are associated with every project.\textsuperscript{21}

Increased education of key players is a fundamental component of raising awareness and working towards the adoption of adaptive reuse as a common practice. New Zealand society is becoming more aware of the concept of adaptive reuse and its links with heritage and sustainability. As such, adaptive reuse is being considered and implemented where previously it was not.

**Benefits**

Adaptive reuse has a variety of benefits, including heritage, environmental, social and economic, many of which align with fundamental principles of sustainability.

Heritage can be defined as:

- The combined creations and products of nature and of man, in their entirety, that make up the environment in which we live in space and time.\textsuperscript{22}

Every building contributes to New Zealand’s heritage; rich with identity, diversity, memory and knowledge they enhance the environments in which we live and provide evidence of the origins


\textsuperscript{22} Committee on Terminology, “Quebec Association for the Interpretation of the National Heritage.”
and development of New Zealand’s distinct society. Once they are demolished, they are lost forever.

Jane Jacobs addressed the importance of the ordinary in her influential text *The Death and Life of Great American Cities*, stating:

Cities need old buildings so badly it is probably impossible for vigorous streets and districts to grow without them. By old buildings I mean not museum-piece old buildings, not old buildings in an excellent and expensive state of rehabilitation—although these make fine ingredients—but also a good lot of plain, ordinary, low-value old buildings, including some rundown old buildings.

Environmental Benefits

James Douglas highlights that demolition is a wasteful, hazardous, polluting, disruptive and costly process. Adaptive reuse largely bypasses this process and has numerous environmental benefits relative to energy, waste, sprawl and internal environments.

One of the main environmental benefits of reusing buildings is the retention of the old building’s embodied energy, making the project much more environmentally sustainable than entirely new construction. Not only are the energy and resources once used to build it retained, but energy is not required for the building’s demolition, transport and disposal. As such, the building does not become part of the waste stream, nor is more energy expended in constructing a replacement.

Adaptive reuse offers a sustainable building site with existing infrastructure and materials as an alternative to our ever-increasing throw-away society. This can contribute to a reduction in sprawl as buildings within the existing urban fabric are reoccupied rather than contributing to redevelopment and horizontal expansion.

26 Embodied energy as defined by the Commonwealth Science and Industrial Research Organisation is ‘the energy consumed by all the processes associated with the production of a building, from the acquisition of natural resources to product delivery, including mining, manufacturing of materials and equipment, transport and administrative functions.’
Adaptive reuse also provides the opportunity to upgrade our existing buildings and provide more energy efficient and healthy environments. Adaptation work can prioritise sustainable choices to create environments that perform better, are more desirable to live and work in with a conscious approach to both embodied and operating energy.

Social Benefits
Many sources, including Cramer, acknowledge that the thoughtless demolition of old buildings is now perceived not only as an ecological waste but also as the eradication of local identity, of cultural heritage and of socio-economic values. The retention of existing buildings can have long term benefits for communities, breathing new life into them and assisting in the retention of the local identity and embodied memory.

Buildings have a history and are a link with the past; adaptation of these into accessible and usable places often encourages public interaction and initiates an increased interest in the building, attracting visitors enticed by the original and authentic nature. Most major cities have areas where many historic buildings have been adaptively reused, and often these are the most vibrant areas of the city with a mixture of building uses and activities. They are seen as authentic and attractive places to live, work and visit, whereas streets lined with modern and contemporary buildings are often sterile, lacking character and community.

Against the amnesia of modern spaces, built forms are described as supports of cultural memory. Brand and Fernandez both address this and suggest that buildings, their materials and their condition tell a story. ‘The built structure remembers living habits and processes, contains information about historic vicissitudes, and forms the material basis of collective memory.’ This is a

28 Cramer and Breitling, Architecture in Existing Fabric, 9.
30 Brand, How Buildings Learn, 104.
31 Fernandez-Galiano, Fire and Memory, 67.
32 Ibid., 66.
memory embodied in society and individuals; it forms a psychological attachment providing comfort through recognition.

Economic Benefits
Adaptive reuse projects often result in impressive economic development through the “knock on effect,” avoiding unnecessary expenditure and providing flexibility in development regulation.

The property value of old buildings declines but breathing new life into them can create a hive of new energy, preserving and capitalising on a building’s unique design. Overall, the atmosphere is enhanced with buildings and surroundings full of life and character, which can act as a catalyst for further adaptive reuse and development. Surrounding buildings can be converted and tourism grows with new reasons to visit.

Many demolished buildings were structurally sound, or would have required only small maintenance and remediation. Even a vacant building is often in good condition, rendered vacant due to a change in society’s needs rather than the building’s condition. These are an existing resource that could be used, saving expenditure on demolition, removal and replacement. According to a US-based report, adaptive reuse is not necessarily cheaper than new construction, but it typically falls within the same range making it a feasible and more sustainable alternative.

Adaptive reuse also allows for the development of buildings in locations that have underlying value, such as urban centres, walkable neighbourhoods or prime commercial districts and there is a degree of flexibility in regulation when working with existing buildings.

Barriers

Despite the inherent advantages of adaptive reuse for certain projects, there are also aspects which are discouraging and can make privileging adaptive reuse less plausible.

Because of the perception that converting old buildings has the potential of being expensive due to unexpected complications, adaptive reuse is often not even considered. Whilst it may be perceived that it can be more expensive, Christian Schittich emphasizes the importance of calculations which include not only construction costs, but also the entire demolition costs when renovation and conversion may look attractive even from an economic perspective.36

Whilst adaptive reuse projects will address the aspects of a new building, such as function, spatial composition and materiality, they are also expected to address unique issues such as the intersection of old and new. Some architects and developers prefer to work with a clean slate, finding restrictive the very suggestion that their design should be informed by what exists.37 However, despite the necessary constraints, Cramer and Breitling consider working within the given fabric of a building to be ‘one of the most creative and fascinating tasks in architecture.’38

Because the advantages of adaptive reuse can be difficult to assess and hard to scope in the early stages of a project, many are not willing to take the risk. It can be difficult to quantify some of the benefits of adaptive reuse, such as long-term social and development advantages, as they are intangible. This can make them difficult to compare with factors commonly considered by developers such as maximising floor area, rentable space and return on investment.

There are barriers associated with all design tasks, including adaptive reuse. Fortunately, there are tools and incentives that could be made available to aid in its feasibility. The initial scoping exercise is fundamental to analyse the potential benefits and plausibility of adaptive reuse. If the Government were to introduce funding assistance, developers may see this as a more achievable

37 Cramer and Breitling, Architecture in Existing Fabric, 9.
option. The provision of funding and incentives for both the recognition and protection of heritage and adaptive reuse is not uncommon on the international scene.

It would be naive to think that all buildings were suited to reuse as some are better suited than others. It is, therefore, important to assess the adaptability of buildings at the outset to enable informed decisions to be made. The ability for a building to adapt is a key attribute for adaptive reuse projects, Kincaid diagrammatically portrays this and Douglas defines adaptability in accordance with five characteristics:\(^3\)

- **Convertibility:** Allowing for change in use.
- **Dismantlability:** Capable of accommodating selective demolition if required.
- **Disaggregatability:** Ability to reuse and reprocess materials and components.
- **Expandability:** Allowing for increases in volume or capacity.
- **Flexibility:** Enabling minor if not major shifts in space planning.

With an increase in education and understanding, it is hoped that developers, property owners, architects and other key players can consider the potential a site and existing building has to offer, rather than automatically assuming the best solution is demolition.

**Recurring Themes**

Recurring themes in the literature reviewed include the need to adaptively reuse buildings in order to capitalise on their cultural and environmental value, as well as the idea that many key players are not ready for the shift towards working with existing buildings. Importance, therefore, lies in educating key stakeholders of the benefits of adaptive reuse and the way in which it can be carried out, as well as breaking down the perceived barriers.

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Limitations and Paucity

Of the literature sourced I found

- A wealth of “coffee table” books on adaptive reuse, however these lacked analytical information, offering little more than a description and images.
- A few key sources providing in depth and thorough information on specific aspects of adaptive reuse. However, many provided a less informative generic overview.
- A significant lack of in-depth information about technical issues, process and critical evaluation of realised projects.

Critical Review of Current Practice

Reviewing current practice highlights the variety of applications of adaptive reuse. The international scene in particular clearly identifies variations in functions, level of intervention and architectural strategies. Build On\(^{40}\) categorizes projects under one of three types of intervention.

- **Add On**
  
  The conversion of the Bankside power station, London in to the Tate Modern Gallery is an iconic in-practice example of vertical extension and the Canton School in Wettingen portrays horizontal extension.

- **Inside Out**
  
  The conversion of the old Eveleigh railway sheds to become Carriage Works Studio in Sydney and the unique transformation of a medieval Dominican church to the Selexyz Bookstore are examples of internal reconfiguration, where the original appearance of existing buildings remains largely intact, but their interiors are changed fundamentally.

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Change Clothes –

Adaptive reuse also has the potential to change the face of an existing building - both programmatically and structurally. Laurent Savioz’s renovation in Chamoson demonstrates one way of exploring this.

Whilst the adaptation of homes, buildings and interior conversions to alternative uses has long been a part of the New Zealand culture with ‘DIY’ and ‘No. 8 wire’ ingenuity, the process of adaptive reuse as a commercial development strategy has emerged more recently. The majority of projects to date have been small-scale adaptations, often working within the existing shell of a building, many of which are for the hospitality industry.

Examples of larger scale adaptive reuse projects in Auckland include the Axis and Heards Buildings in Parnell, the Steel Works in Mt Eden, and Britomart in the central city. Many adaptive reuse projects are often ‘person led’ by someone with a vision, an understanding or a passion who acknowledges the benefits and is prepared to see past the barriers. The resulting projects play an invaluable role in the awareness of adaptive reuse, providing an in-practice example.

Conclusion

The process of adaptive reuse has numerous benefits, many of which align with the “mantra” of sustainability. Adaptive reuse has the potential to further this through the intentional implementation of sustainable design practice. The adaptive reuse paradigm will continue to evolve, innovations will become more main stream and the reuse of buildings will become a more integral component of sustainable development. The seeds have been planted and it is only a matter of time before the heritage, environmental, social and economic advantages of adaptive reuse are truly understood and appreciated.

41 Derek Latham discusses that adaptive reuse projects are often ‘person led’, ‘building led’, ‘use led.’ Derek Latham, Creative Re-Use of Buildings: Volume 1 (Dorset: Donhead, 2000).
3. SUSTAINABILITY

'We do not inherit the Earth from our Ancestors,
we borrow it from our Children.'

Navajo Proverb
Critical Review of Current Knowledge

A Global Movement
The World Commission on Environment and Development’s 1987 Brundtland Report, *Our Common Future*, was an important contributor in the sustainability paradigm shift. It provided an early and still much used framework for addressing ways of protecting the Earth’s ecosystems while taking into consideration economic and social justice concerns. It also defined sustainable development, stating it as, ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’ This remains consistent with modern dictionary definitions of sustainability which refer to continuity and maintenance of resources. The report also acknowledged that humanity has the ability to make development sustainable and that sustainable development is not a fixed state of harmony, but rather a process of change.

With an increased understanding regarding the earth’s resources and a level of conscious towards doing “the right thing,” the level of support for sustainable practice has escalated in past decades. It has become a popular concept in today’s society; a wide-ranging term that is applied to almost every facet of life on Earth. Sustainability varies in meaning from person to person, in different environments and different industries. It is commonly known to consist of three pillars; environmental, economic and social aspects establishing a holistic approach, referred to as ‘the triple bottom line.”

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44 In line with the movement internationally, the New Zealand Parliamentary Commissioner for the Environment (PCE) took the definition a step further in 2002, identifying sustainable development as a holistic approach. The move towards a sustainable society takes into account environmental concerns as well as economic, social and cultural aspects. Johann Bernhardt, ed. *A Deeper Shade of Green* (Auckland Balasoglou Books, 2008), 10.
45 Williamson, Radford, and Bennett, *Understanding Sustainable Architecture*, 127.
Sustainability and the Built Environment

The built environment plays a substantial role in the world’s development. Not only does it provide infrastructure to carry out our daily lives, but it is expansive and consumes vast planes of the earth; uses exponential amounts of the earth’s resources, raw materials, energy and capital; and it contributes a large percentage of the Green House Gases (GHG), pollutants and waste which can be detrimental to the environment.

Globally, 40 per cent of all energy and material resources are used to build and operate buildings, 40 per cent of greenhouse gas emissions come from building construction and operation, and 40 per cent of total waste results from construction and demolition activities.46

William Rees, the originator of the ‘ecological footprint analysis’ concept, contends that no other industrial sector has greater opportunity and none is better positioned to lead the quest for global sustainability than the building and construction sector.47 As such, sustainability is an essential concern in the discourse of architecture.48 However Maxman suggests that there is no prescription for sustainable architecture.49 This is further reinforced by Williamson, Radford and Bennett who note there is ‘no fixed set of rules which will guarantee success if followed. Rather, there are difficult interrelated decisions to be made that are contingent on particular circumstances.’50

Despite this, in-practice examples and frameworks play an important role in the paradigm shift. They portray what can be and achieved and offer guidance as to how one may go about it, enabling people to grasp and understand the concept, enabling a change in thinking. Guy and Farmer present a series of six logics (Eco-technic, Eco-centric, Eco-aesthetic, Eco-cultural, Eco-medical and Eco-social) in an effort to define and categorize the concepts often associated with sustainable

47 Ibid.
48 Williamson, Radford, and Bennett, Understanding Sustainable Architecture, ix.
50 Williamson, Radford, and Bennett, Understanding Sustainable Architecture, 126.
architecture as a ‘mean of raising awareness of all the issues that can be considered’\textsuperscript{51}. Williamson, Radford and Bennetts acknowledge, discuss and reinterpret these principles\textsuperscript{52} as well as attempting to quantify the interrelated decisions of sustainable architecture in their ‘partial checklist for sustainability’

Sustainability and New Zealand

New Zealand is a comparatively small country and not often at the forefront of global movements; sustainability is no different. However, there is a level of awareness throughout society and across a range of industries. There has been, and there remains, a conscious effort within the architectural profession to raise the level of education and awareness, through seminars, publications\textsuperscript{53} and initiatives\textsuperscript{54}. In their recently published Manifesto \textit{Shaping Our Places}, The New Zealand Institute of Architects highlighted sustainability as one of five key concepts on which New Zealand’s future must be built.\textsuperscript{55}

The growing adoption of environmentally sustainable design principles and practices means more new buildings are being designed this way, driven in part by increased market demand. Factors influencing this increased market demand may include lower operating costs of ‘green’ buildings, increased occupant health, satisfaction and productivity, reduced absenteeism, readily accessible

53 A Deeper Shade of Green is a valuable New Zealand reference; both for its contextual relevance and its variety of perspectives across the realm of sustainable practice, the built environment and New Zealand. It is organised in eleven topics, consisting of a compilation of short texts written by different figures from within the realm of New Zealand’s built environment. They present a wide variety of ideas and opinions (rather than a single minded perspective), and touch on a range of issues, opening the readers mind to different ideas and encouraging the pursuit of further research. Bernhardt, ed. \textit{A Deeper Shade of Green}
54 Initiatives including the New Zealand Urban Design Protocol, the New Zealand Green Building Council and the Green Star environmental rating scheme for buildings, the Building Code review, and built environment sustainability research consortiums, such as Beacon Pathway. Maarbrit Pedersen Zari, "Towards a Sustainable Future: Adopting a Regenerative Approach to Development," (Wellington: Ministry for the Environment, 2009).
guidance on environmental standards, Green Star rating tools, an increased desire to address environmental issues, and a global trend towards sustainable building.  

Recurring Themes

Themes reflected in the literature include: a holistic approach, inclusive of the three pillars (social, economic and environmental), sustainability as an attitude and a way of thinking; the significant role of the built environment and the importance of increased awareness.

Limitations and Paucity

Sustainability is a very broad topic. It is difficult to define and there are many views about what is sustainable and how to be sustainable. ‘The imprecision and uncertainty surrounding sustainability and the means for its achievement make knowledge, how it is used, and how relevance and ignorance are dealt with all particularly important.’

Critical Review of Current Practice

In addition to the precedents below, the applications of climate responsive architecture, contemporary technologies, regenerative development and current evaluative means have been explored and form Appendix B.

Internationally, there is a generous variation of solutions which aim to fulfil the demand for a sustainable architecture. These vary from High-tech solutions such as City Hall, London to Low-tech

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56 Zari, “Towards a Sustainable Future.”
57 Williamson, Radford, and Bennett, Understanding Sustainable Architecture, 67.
solutions such as the Straw Bale House, London to PassivHaus concepts in Germany or carbon neutral developments such as The Beddington Zero Energy Development and many more.

The New Zealand context provides less variation in sustainable building typologies than the world scene. However, there is a clear distinction between sustainability in residential architecture, often adopting passive techniques and derived from context, compared with larger scale and commercial developments which are often attuned to the more high-tech end of the spectrum, evaluated and compared using the NZGBC rating.

The Meridian Building is not only a landmark on Wellington's harbour, befitting the Capital city, but it achieves leading edge environmental performance and was New Zealand's first 5 star rated building. The NZI Centre and Ironbank, both in Auckland, are 5 star rated developments which performed well on a holistic level at the 2010 New Zealand Architecture Awards. They each received a Sustainable Architecture Award and a Commercial Architecture Award. The NZI Centre also won an Interior Architecture Award and Ironbank won the New Zealand Architecture Medal.

The Geyser building, Parnell is set to be New Zealand's first project with a 6 star rating. Jane Henley, NZGBC Chief Executive, notes that this project highlights how far Green Building in New Zealand has come, sets an exciting new benchmark and reflects the ability of the industry to deliver world leading green buildings for the benefit of tenants, investors and indeed all New Zealanders.

60 "Passivhaus," http://www.passiv.de/07_eng/index_e.html.
62 Under the New Zealand Green Building Council’s Green Star - Office Design v1 certification scheme.
64 Ibid., 56.
Conclusion

Having gained momentum in the second half of the 20th century, sustainability has become a household term, both internationally and here in New Zealand. Awareness and publication is increasing, and sustainability is frequently a focus of discussion as we work to fill the gaps of previous generations and establish new knowledge. As such, we are making steps towards a more sustainable future and the building and construction industry has the potential to make a large and positive contribution to this.
4. INTEGRATION OF SUSTAINABLE PRACTICE IN ADAPTIVE REUSE

‘To climb steep hills requires slow pace at first.’

William Shakespeare
Critical Review of Current Knowledge

Whilst both adaptive reuse and sustainability are each at the forefront of a paradigm shift and are being implemented both locally and internationally, I believe further potential lies in their combined application, enhancing and strengthening each other. Whilst ‘the continued use and development of existing buildings is fundamentally sustainable’ and this frequently acts as a motivation for the adoption of adaptive reuse, there is the opportunity to further expand on this and employ sustainable design practice and technologies throughout the project.

Warwick Fox uses the term ‘responsive cohesion’ to describe a state in which the various elements of a ‘thing’ (design work, community, creature) or process (design, construction etc.) exhibit a reciprocal interaction between elements that constitute it, and the context in which it is located.

This aligns with the intention of the combined application of adaptive reuse and sustainability, resulting in a solution which can match new construction, with the added benefit of retained embodied memory. Whilst there are significant resources on the topics of both adaptive reuse and sustainability, there is a relative paucity of material on the combined application of these practices. In order to realise, and capitalise on, the potential benefits of sustainable practice in adaptive reuse, a paradigm shift needs to take place.

66 Cramer and Breitling, Architecture in Existing Fabric, 199.
67 Fox as cited in Williamson, Radford, and Bennettts, Understanding Sustainable Architecture, 89.
Critical Review of Current Practice

Currently, sustainable practice is predominantly employed in new construction and adaptive reuse is often not done in a way which prioritises or explores the full potential of sustainable design. A new approach would be to maximise the use of sustainable technologies and design practice in the adaptive reuse of our existing building stock.

It is important to note that the combined application of adaptive reuse and sustainability is different from the current trend of greening existing buildings. The proposed concept of integration is a holistic vision to adapt and often fundamentally change an existing building in order to accommodate a new use and provide social, economic and environmental benefits rather than the replacement or upgrading of independent building components or services system in order to reduce energy consumption for economic reasons.

Whilst there are numerous adaptive reuse projects and many projects which look to explore sustainability, there is less evidence of sustainable practice in adaptive reuse. ‘Each project, by itself, may have limited impact, but as a means of changing attitudes and values, the possibilities inherent in even very modest projects are immense.’ Following is a brief description of two projects which are considered to have successfully dealt with the integration of sustainable practice in adaptive reuse. Both designs have introduced atria as an integral component of their sustainability and building performance strategy but also as in influence in establishing a “sense of place”.

Conservation House, Wellington, New Zealand

This refurbishment of a former cinema complex to become the Head Office for the Department of Conservation ‘aimed to reduce impact on the environment, both during construction and on an ongoing basis.’ The Department of Conservation has the role of protecting New Zealand’s environmental heritage.

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natural environment and historic heritage, as such 'it was only fitting that their Head Office reflects this responsibility.'\textsuperscript{70} The project by architecture+ employed significant changes to the building fabric to achieve the ongoing sustainability of the building and since its completion it has won numerous awards including the NZIA Resene Supreme New Zealand Award and Wellington Civic Trust Award in 2008 and the Ministry for the Environment Environmentally Sustainable Design Award in 2006.

**IXL Development, Hobart, Australia**

The IXL Development at Sullivans Cove in Hobart saw the former Jones & Co jam factory transformed to become a mixed use development including retail, hotel, offices and dining establishments by architects Morris-Nunn & Associates.

The development scooped four out of seven top awards at the Royal Australian Institute of Architects 2005 Tasmanian Architecture Awards; winning Public Buildings (New and Recycled), Heritage Architecture, Interior Architecture and Environmental Design.\textsuperscript{71}

**Conclusion**

Both adaptive reuse and sustainability are important architectural strategies in their own right. However, ‘the whole is more than the sum of its parts’\textsuperscript{72} and what they can achieve together could far exceed their individual contributions. Together they create something different, new and unique with the benefits of both. The opportunity to integrate sustainable design principles when carrying out an adaptive reuse project is an exciting prospect and this research project explores the application of combining two separate disciplines within a unified project and framework.

\textsuperscript{72}Metaphysica 10f-1045a Aristotle, “Quotations by Aristotle” http://www-history.mcs.st-and.ac.uk/Quotations/Aristotle.html.
The following chapters outline the design component of this research project which is the redevelopment of the former Auckland Laundry Building in Grey Lynn into a creative precinct, a unique community resource and an ongoing architectural legacy. This contributes to an increased awareness of adaptive reuse, making explicit the process of adaptively reusing an existing building in a sustainable manner and demonstrating the application of the research findings. It will also demonstrate the viability and potential of adaptive reuse as a sustainable development option and alternative to demolition and replacement.
5. SITE ANALYSIS

‘You cannot simply put something new into a place. You have to absorb what you see around you, what exists on the land, and then use that knowledge along with contemporary thinking to interpret what you see.’

Tadao Ando
The building and site chosen for this design project is the former Auckland Laundry Building. Located at 58 Surrey Crescent, Grey Lynn, Auckland, this was designed in 1938 and built shortly after. Despite existing shortfalls, such as poor internal environments, inefficient performance and low occupancy rates, the building, site and surrounding community are perceived to have a number of benefits, contributing to its selection for this design project.

Perceived benefits

- Located in Grey Lynn on Auckland’s city fringe, an accepting and culturally rich community with an actively pursued interest in both environmental and social sustainability.
- The site offers an opportunity to revitalize and enhance the surrounding area and provide facilities different from those currently available.
- Situated within walking distance of two community and retail nodes, close to arterial routes and well served by public transport.
- 3,896m² existing building floor area, 5,268m² site area, Mixed Use Business Activity Zone enabling ‘a diverse and compatible mix of residential, business, educational and leisure activities.’62
- A four-storey building in good physical condition, concrete frame construction with no internal load bearing walls, allowing for internal flexibility.
- High level of adaptability and suitable to explore variety of adaptive reuse strategies.
- Vehicle and pedestrian access from both Surrey Crescent (Level 3) and Great North Road (Level 1).
- Vacant land to the North and West with potential for further compatible development.

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Physical Context

The selected building and site is located approximately 5km from Auckland's Central Business District, in a desirable residential suburb on the city fringe. The area is rich in amenity with two community and retail nodes (Grey Lynn and West Lynn), both within walking distance of the site. It is well served by public transport with frequent bus services stopping within 50 metres of the site on both Surrey Crescent and Great North Road. The project site consists of three lots. A large central lot (Deposited Plan 352767, Lot 3, 3126m²) set back from both Surrey Crescent and Great North Road, and two smaller lots to the north east (Lot 6, 1130m² and Lot 8 of 1012m²) connecting it to Surrey Crescent with a 26 metre frontage. The site is also connected to Great North Road via an 8 metre wide access way.

The site slopes from north to south, from the ridge of Surrey Crescent, towards the gully of Great North Road. The concentration of the fall is around the centre of the site where the Laundry Building is located. This is the only remaining building on the site and is positioned approximately 80 metres back from Surrey Crescent. As such it provides no level of engagement at the street edge and is often overlooked. Vehicular and pedestrian access to the site is available separately from both Surrey Crescent and Great North Road although without connection between. However, there is an opportunity to introduce pedestrian connection between Surrey Crescent and Great North Road. Vehicular parking currently dominates the north of the site at Surrey Crescent.

The site is noted by the Auckland City Council as suitable for mixed use occupations intended to 'allow the development of vibrant urban areas... where opportunities exist to live, work, learn, shop and undertake leisure activities... which contributes to the amenity of the surrounding neighbourhood.' This zoning permits a maximum 15 metre rolling height plane and a floor area ratio of 2:1.

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63 Connection can only be achieved by passing over a neighbouring property.
64 "City of Auckland - District Plan Isthmus Section."
65 With potential for bonus floor area in exchange for plaza, landscaped zones and pedestrian/cycle ways with a maximum permitted floor area ratio of 4:1. Mixed Use Zone Development Control 8.8.10 Ibid.
The character of the immediate area varies substantially in accordance with different uses and building typologies. The surrounding buildings have largely inactive frontages and there is limited amenity to promote pedestrian traffic. The contribution that these buildings make to the vibrancy and vitality of the street scene at present is poor. The development pattern along both Surrey Crescent and Great North Road is fragmented and discontinuous; punctuated with a series of gaps and gateways between buildings. The occupations and buildings surrounding the site include:

- **East** - Grey Lynn Primary School.
- **South** - several car sales yards, and the opposing side of Great North Road is Residential Zone 6b (predominantly 1950's state housing).
- **West** - mixed use office buildings and St Columba Church.
- **North** - across Surrey Crescent is a 15m high apartment complex, light industrial and Residential Heritage Zone 1, characterized by tree lined streets boasting villas and bungalows of the Edwardian and Victorian periods.
Figure 5-4 Analysis of Suburban Context
Figure 5-5 Analysis of Immediate Context

1. Jaffa, Design Tribe, Flying Canoe (business mixed use zoning)
2. 5 storey apartment complex (Business Mixed Use Zone)
3. Routubark Music Therapy (Residential Heritage Zone 1)
4. Edwardian/Victorian Villas (Residential Heritage Zone 1)
5. St Columba Anglican Church (Business 5 Zone)
6. Office & Classic Car Storage (Business Mixed Use Zone)
7. Potential Development Site (Business Mixed Use Zone)
8. Mixed Use Offices (Business Mixed Use Zone)
9. Mixed Use Offices (Business Mixed Use Zone)
10. Grey Lynn Primary School (Special Activity 2 Zone)
11. Grey Lynn Bowling Club Open Space 3 Zone
12. Car Sales Yard (Business 5 Zone)
13. Car Sales yard (Business 5 Zone)
14. Residential 5 Zone
15. Residential 6a Zone
Figure 5-6 Photographs - Surrounding Buildings

State Housing to the south of the site
Car Sales Yards to the south of the site
Mixed Use Office to the west of the site
Mixed Use Building to the north-west of the site
Apartment Complex to the north of the site
Zone 1 Residential to the north of the site
History

One hundred and fifty years ago the hills and valleys of Grey Lynn and surrounds were covered with fern and manuka; by 1900 the landscape was covered by industry and housing.66 Maori had been present on the Tamaki Isthmus from around 1000 AD.67 While many small sub-tribal groups moved through the area, Waiohua were tangata whenua until overwhelmed by Ngati Whatua in 1750.68 In 1840 Ngati Whatua sold substantial amounts of land around the Waitemata Harbour to Governor Hobson who established Auckland as the colony’s capital there.69

Records suggest land in Grey Lynn became available for purchase as early as 184470 and whilst surrounded by subdivision, the Surrey Crescent/Great North Road block, and the project site in particular has almost always been industrial. The land is thought to have been purchased by Thomas Faulder who leased the land for farming as well as running a night soil operation. It may be this use which resulted in the fertility of the land which later became known as Chinaman’s Hill for the Chinese market gardeners who cultivated the land to grow produce, supplying both local and inner city residents. Exactly when they started up is not known but they were in full operation by at least the mid 1880s,71 and the 1890s valuation rolls show a Fong Chaw living in one of Thomas Faulder’s houses ... and possibly working that land.72

The Auckland Laundry Company purchased the land in 1927 as part of the “Auction of ‘The Great Central Estate,’ Surrey Crescent, Great North Road, Grey Lynn. Fine Freehold Shop and Residential Sites.”73 The Auckland Laundry Company built a number of buildings on the site, including the existing concrete laundry building. Following their construction the buildings saw many additions

68 Ibid., 3.
69 Ibid., 4.
70 Ibid., 10.
72 Hiyama, High Hopes in Hard Times, 29.
73 Ibid.
and alterations as the facilities expanded and adapted to accommodate demand. These buildings provided important services for the city of Auckland, primarily servicing Auckland Hospital. The Auckland Laundry Company sold the land and associated buildings in the latter half of the century and the buildings were tenanted on and off, eventually falling into a period of neglect.

However, the large site area and city fringe location made the site desirable for development and in the past ten years there have been two proposals for redevelopment.

Firstly, a developer looked to maximise town planning allowances and a blanket five storey, 270 apartment development was proposed. Despite being granted consent with construction of phase one due to commence, public opposition caused the proposal to be abandoned and the land sold.

The second proposal involved the Laundry Building alone, working within the existing envelope it proposed dormer windows and a mezzanine to enable occupation of the roof space and “Juliet” balconies to the west. This proposal was also abandoned but site works went ahead, demolishing all buildings except the concrete frame Laundry Building and subdividing the land into 5 lots. Remedial work was also carried out to the Laundry Building and lightweight inter-tenancy walls made it tenantable. As such the building still stands today however it is not occupied to its full potential nor does it appear to be performing to currently expected levels.

74 Personal Communication, Building Managers, Phillipa of Chelsea Contracting Ltd
Community

Due to its proximity to the CBD and a high level of amenity, Grey Lynn is a desirable residential suburb and a ‘diverse multicultural community of alternative lifestyles and creativity.’76 (See Appendix D for a register of creative industries in the area). The demographic breakdown, according to the 2006 census, is predominantly European followed by Pacific Peoples registering 19.3% and Maori at 9.8%77.

Grey Lynn is an energetic and spirited area with a strong focus on community and an actively pursued interest in sustainability. “Grey Lynn 2030” is a sustainability group which organizes and promotes events and education on sustainability both locally and wider afield.78 It is often the catalyst for environmentally and socially sustainable ventures such as “Transition Towns” and the Grey Lynn Farmers Market.79 Grey Lynn also has many community focus groups and organisations including the Urban Environment Group, community gardens,80 the ‘green screen,’81 Traffic Calming Group, Water Focus Group and Grey Lynn 2030 Waste Away.

Grey Lynn is a creative, sustainable and community focused suburb. However, despite this, it lacks facilities for artists and creative minded people to rent, work and exhibit.

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76 “About.”
79 The Grey Lynn Farmers Market is currently held at the Grey Lynn Community Centre, however due to popularity since it began in September 2009 it has acknowledged it is too big for its current location.
80 Community gardens are popular in Grey Lynn with sites both on Wilton Street and at St Columba church.
81 A community initiative film screening, monthly at the community hall promoting community, education and sustainability.
SITE ANALYSIS

Climate
In addition to figures, first hand experiential knowledge of the site’s climate has been gained through time on site and living in the Auckland region. This became an important influence throughout the design process.

New Zealand is considered to be a temperate climate and Auckland is near-subtropical; this results in varied and unpredictable weather conditions. The warm and wet climate brings hot, humid summers and mild, damp winters with high rainfall throughout the year, in particular during winter months.82

Sunshine83 Auckland is located at 36.7 degrees latitude and has an average of 2,060 sunshine hours per year.

Wind Auckland has a predominant South Westerly wind with a less frequent North Easterly which is often associated with wind driven rain.

Temperature84 Auckland average summer temperature (°C): 20
Auckland average winter temperature (°C): 11

Rainfall85 Auckland average annual rainfall: 1,240mm

83 Ibid.
84 Ibid.
85 Ibid.
Existing Building

In an adaptive reuse situation ‘a thorough knowledge of a building is vital in order to be able to reliably plan safe and sustainable building works.’\textsuperscript{86} In order to gain this knowledge it is necessary to investigate the building at the project outset. Information required may include the mode of construction, structural arrangement, physical condition, architectural or historical significance and adaptation potential. It may also include 'changes that have taken place over time, the present levels of performance and the remaining service life of the building’s main elements, components and services infrastructure.'\textsuperscript{87} This knowledge can be used to establish a building's adaptive capacity, act as a tool to facilitate change and 'provide the basis for determining the scope and boundary conditions for the design process.'\textsuperscript{88}

The Laundry Building is a rectangular structure, approximately 28 metres north-south, and 37 metres east-west. The building is four stories high including a part basement. It has a reinforced concrete frame structure with bays varying from 5.2m - 6.2m. There are no internal load bearing walls and lateral load resistance is provided by perimeter concrete spandrel panels, the internal concrete frame structure and the concrete floor diaphragms.\textsuperscript{89} Seismic evaluation in 2005 deemed the building structurally sound with an expected life of no less than 50 years.\textsuperscript{90}

The building is almost entirely concrete, aside from original timber windows, occasional timber flooring and brick infill on the western facade. The building is in good physical condition and the materiality, whilst raw and industrial, is engaging and rich in character, the patina suggesting the history of the building. Floor to floor heights are 3.7metres (Level 1), 4.1metres (Level 2), 4.4metres (Level 3) and 3metres (Level 4). The building has a “Dutch gable” roof covering the North three bays and an almost flat roof enclosing the South two bays which was originally open and operated as the laundry drying deck.

\textsuperscript{86} Cramer and Breitling, Architecture in Existing Fabric, 67.
\textsuperscript{87} Douglas, Building Adaptation, 66.
\textsuperscript{88} Cramer and Breitling, Architecture in Existing Fabric, 46.
\textsuperscript{89} Oliver, “Seismic Evaluation - 58 Surrey Crescent, Auckland,” 4-2.
\textsuperscript{90} Ibid.
Through investigation of the building, including site visits and discussions with tenants and the building managers, performance weaknesses quickly became apparent. Whilst tenants generally like the building, its character and location; they indicated that the internal environments are poor. It over-heats in summer and is cold in winter, has bad acoustic performance, no solar control, glare, limited user control, poor ventilation and low levels of natural light, resulting in a high reliance on artificial lighting. There is no mechanical heating and ventilation system in the building although some tenants have provided their own. Furthermore the internal configuration resembles a 'rabbit Warren' which is not only a security concern but results in a lack of community, collaboration, interaction or ownership as tenants rarely pass in the corridors.

These weaknesses are not detrimental to the building’s adaptability or potential for success. They form an integral part of the design process, providing the opportunity for design to ‘respond to the buildings natural attributes and enhance its short comings,’91 bringing it up to standards expected of a building in the 21st Century.

Evaluation of the Laundry Building in accordance with Douglas’s five characteristic for adaptability (see Chapter 2 – Adaptive Reuse) results in a rating of 41/50, identifying the buildings suitability for adaptation.

- **Convertibility:** Allowing for change in use. 9/10
  Town planning permits a change in use to a wide variety of alternatives. Needs within the community have been identified for facilities different to those currently provided and the building’s structure enables the accommodation of change.

- **Dismantlability:** Capable of accommodating selective demolition if required. 8/10
  Whilst the primary frame construction needs to remain, floors and walls can be removed safely and efficiently if deemed necessary.

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- **Disaggrepatability**: Ability to reuse and reprocess materials and components. 7/10
  Efforts will be made to reuse disassembled elements on site wherever possible such as breaking down the concrete to reuse as aggregate in new works. An intention is to ensure a higher level of disaggregatability in the proposed design.

- **Expandability**: Allowing for increases in volume or capacity. 9/10
  The building construction method, associated site and town planning regulations allow for a variety of expansion options.

- **Flexibility**: Enabling minor if not major shifts in space planning. 8/10
  Space changes are easily accommodated due to the frame construction with no load bearing walls. Whilst the building as a whole is flexible, it is intended to increase this through design, enabling the building to adapt and change at all levels including user control and flexibility at tenancy level, increasing its ability to accommodate future change and prolong life.
Figure 5-16 Existing Floor Plan Analysis
6. PROGRAMME

'It is my belief that exciting things happen when a variety of overlapping activities designed for all people ... meet in a flexible environment.'

Richard Rogers
The selection of a new use for an existing building can play a fundamental role in a project’s success. It is therefore important to consider the proposed use in conjunction with the existing building’s characteristics (e.g. floor to ceiling heights, floor plate depths, structural systems) and its contextual characteristics (e.g. location, proximity, community needs). Whilst success is often linked to the compatibility of the existing building and the new use, it should not restrict consideration of all possible options. 'Sometimes the mark of a successful project can be the tension between the expected use and a completely different, new function that has been cleverly fitted into it.'

The initial intention was to develop the Laundry Building as an office complex for high-end creative professionals. This has been refined during the cyclic research and design process as I gained a deeper understanding of Grey Lynn, the profile and needs of the community, the creative industries and the physical characteristics of the existing building. New insights gained during this process led to recognition of the potential for a more diverse and extensive creative precinct in order to meet and reflect the community needs.

Auckland City Council acknowledges that 'recognition and promotion of diversity in arts, the community and recreation is key to developing Auckland as a modern, vibrant, creative, innovative city where people want to live, visit and invest.'

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Rationale for a Mixed Use Creative Precinct:

- Providing an amenity that demonstrates the practice of adaptive reuse to aid in raising awareness within the public realm and architectural profession.
- Providing an amenity different from those currently available in the area for both the local and wider communities, in particular the creative industries.
- Rejuvenating the existing building, site and surrounding area and ensuring the future of the Laundry Building as an ongoing piece of Grey Lynn's history.
- Linking the compatibility of spatial requirements with the existing building structure.
- Contributing towards Auckland City Council’s goal of increasing the creative industries and establishing Auckland as the heart of art in the Pacific.  
- Providing a character rich, unique and inspirational environment to be appreciated by creative individuals and those who are sensitive to their environment and nature.
- Establishing a building rich in spatial expression, flexibility and adaptability, designed to facilitate creativity and exhibition throughout with the building as “the canvas.”
- Providing opportunities to “live, work and play,” harnessing the social, economic, health and environmental benefits of mixed-use.
The programme is multifaceted, incorporating facilities, services and activities which are both supportive and mutually complementary of each other while also creating a vibrant work environment, encouraging collaboration and fostering a sense of community.

Spaces provide for a variety of occupants including artists/designers (sculptors, painters, photographers, furniture, jewellery and fashion designers) and office-based creative professionals (architects, graphic designers, brand management, marketing, advertising and publishing). A variety of environments are proposed, offering casual, short and long-term tenancies (workshops, studios, offices, photographic studios, exhibition, retail, gallery) as well as support facilities such as hot desks, breakout spaces and meeting pods. Studio apartments with access to roof terraces and allotment gardens provide further opportunity to reside on site, facilitating artists in residence and live/work scenarios.

Facilities and activities for the public are prominent and diverse, including a boutique cinema, seminar and conference facilities, a café and cooking school with onsite food production, rentable space for community programmes such as art classes and meditation, function space suited for the farmers, craft and designer markets along with exhibition space, both designated and throughout the building.

It is anticipated that the character, quality and flexibility of the facilities will attract high market rentals, which will assist in subsidizing the public and community services. A percentage of spaces and exhibition provisions will also be made available for cultural and indigenous art to support the diversity of Grey Lynn and Auckland City.

The potential exists for the vacant land to the north of the existing building to be developed as a public realm, providing facilities which further complement the creative precinct and surrounding community.

Figure 6-1 Kate Sylvester’s fashion range
In the early 2000’s Kate Sylvester held a fashion show in the redundant Laundry Building. Following which she suggested to the owner that it would be fantastic to develop the building to include facilities across the disciplines enabling design, manufacture and retail. This has influenced the multi faceted nature of the proposed brief.

Personal Communication; Building manager, Philla of Chelsea Contracting Ltd.
7. DESIGN STRATEGIES

‘Tell me and I’ll forget,
Show me and I’ll remember,
Involve me and I’ll understand.’

Chinese Proverb
In addition to establishing a comprehensive design solution to bring the existing building up to contemporary standards, the architectural solution actively portrays strategies for adaptive reuse and sustainability, contributing to an increased awareness of their potential as an alternative to demolition and replacement.

Following a preliminary review of current knowledge on adaptive reuse and on sustainability an investigation was undertaken of the Laundry Building, site and context, followed by an exploration of alternative design solutions. Explorations focused on site planning, functional organisation and massing, with particular regard to the degree of intervention appropriate in this situation. Alternative strategies included addressing the entire site and surrounding vacant land, working solely with the existing building, creating a second skin or “veil” around the existing building, extensions and building proposals to each of the elevations separately, vertical extension and over-roofing and various forms of atriums. This was an important part of the process, enabling me to clarify and consolidate my intentions through the elimination and refinement of options.

It also became clear that in order to establish a rational and comprehensive solution which demonstrates the use of sustainable practice in adaptive reuse, this project demanded the recognition and resolution of a number of issues on a number of levels. Whilst each of these had their own constraints, they were all intrinsically linked, requiring a constant awareness and consideration of all other aspects of the design, and the implication each decision has on the overall cohesion of the project. Williamson, Radford and Bennetts support this view recognising that buildings should be viewed as ‘a response to many disparate requirements and origins high in our consciousness, in contrast to the prevalent architectural notion of the dominant unitary concept as the generating source of good building’.96

Degrees of Intervention

Adaptive reuse is a form of rehabilitation, which can be applied at different levels of intervention from minor changes through to significant works. Cramer and Breitling draw attention to the fact that the degree of intervention forms a central question when deciding between different design concepts and Kincaid states that ‘the extent, type and combinations of physical changes that are to be undertaken are of fundamental importance to any refurbishment strategy.’

This design project proposes changes in all three of the categories identified in Build On (see Chapter 2 – Adaptive Reuse), providing an opportunity to explore a variety of different adaptive reuse strategies and resulting in a design solution to truly rival new construction.

Add On –

My design solution extends horizontally and vertically, increasing rentable floor area and the range of amenities available and making better use of land, a precious resource.

Town planning regulations, site parameters and existing building structure all facilitated the extension. In particular the availability of land to the west, combined with the brick infill of this facade led to a horizontal extension and creation of a west annex. This infill does not contribute to the building’s structure and can be removed to facilitate extension with no detriment to the building.

A vertical extension has also been employed, introducing residential apartments and studio spaces. This was prompted by the structural capacity of the existing building to accommodate additional load with limited and relatively straightforward strengthening. Furthermore, the existing roof responds to neither the building’s internal function nor the climate. It is proposed this be removed in order to increase accommodation and establish a roof which responds to its unique situation, sloping with the topography and highlighting the atrium with benefits of passive solar gain, ventilation and the generation of energy.

97 Cramer and Breitling, Architecture in Existing Fabric, 111.
Inside Out -
The design proposes major internal reconfigurations to improve the shortfalls identified within the existing internal environments. A significant initiative is the selective demolition to convert low quality rentable area of deep floor plates to become an atrium. This is supported by Kincaid’s investigations into UK based developments which ‘consistently confirmed that a degree of partial demolition is beneficial, first to extend the range of possible uses of a redundant buildings, second to achieve environmental improvement and energy savings, and third to introduce new financially viable options for use.’

Change Clothes -
The proposed design retains the existing building envelope and retrofits sun shading and wind deflecting measures as required to improve the environments, respond to climate and provide user control. The existing building provides both the support for and is a driver of such interventions which respond to the physical characteristic of the building as well as the climatic conditions of its location. Whilst this will have a visual impact, it is a relatively low level and low tech intervention when compared to options such as a second skin or re-cladding.

In summary, a high degree of intervention is proposed for the Laundry Building. This is to bring the building up to the standard expected of a new building, as well as demonstrating the intervention strategies which can be employed in the process of reusing a building. Whilst the visual impact of the new work may appear distinctive, this is intentional. Firstly, as a strategy to generate attention, creating a lasting impression, and secondly, it will publicly exhibit a living and accessible example of the strategies available and what can be achieved.
Occupancies
The programme for this design project involves a diverse mixture of facilities to suit varying activities and occupants. Accommodation of these has taken account of occupational requirements of light, ventilation, acoustics, access, exposure, privacy, security, amenity, size and spatial composition.

There are a range of spaces throughout the building; these vary in size from breakout spaces and meeting pods to individual tenancies, rentable facilities and office platforms. Depending on demand these can be occupied differently either by an individual, a small company, a consortium of like-minded individuals or a larger company.

The spaces are also designed for flexibility and adaptability. Fixed balustrades with pivoting, sliding and stacking panels above enable occupancies to achieve varying degrees of openness. As well as high level louvres to promote natural ventilation at all times, including when tenancies require privacy.

The building is organised both horizontally and vertically. With an atrium running east - west in the central bay. The south of the building is primarily occupied by the studio and 'working' spaces. This is in accordance with the quantities of natural, indirect light from both the south elevation and the atrium to the north. The north of the atrium provides a variety of different conditions, therefore the occupations are more specific, relative to their requirements, such as lighting given levels 1 and 2 on the north elevation are underground.

The building is also organised per level having given consideration to aspects such as access and security, occupations with larger public interest are on levels 1 and 3 in close proximity to building entries, and facilities requiring increased privacy and security, such as residential apartments are on the upper levels.

A diagrammatic breakdown of the occupancies on each level and area calculations follow.
Figure 7.3 Level 1 Plan

<table>
<thead>
<tr>
<th>Existing</th>
<th>Boutique cinema</th>
<th>Public</th>
<th>Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference and seminar facilities</td>
<td>Rentable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop spaces with mezzanine design studio</td>
<td>Tenanted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian and cycle connection</td>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foyer/Ground level of atrium</td>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building managers office &amp; storage</td>
<td>-</td>
<td></td>
<td>Servant</td>
</tr>
<tr>
<td>New</td>
<td>Car, scooter and bicycle parking</td>
<td>-</td>
<td>Servant</td>
</tr>
</tbody>
</table>

Public, Rentable, Tenanted, Residential

Open Space, Private Space
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Status</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>Boutique cinema (double height)</td>
<td>Public</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Conference and seminar facilities mezzanine</td>
<td>Rentable</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Mezzanine design studios above workshop</td>
<td>Tenanted</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Photographic Studio</td>
<td>Rentable</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Studio</td>
<td>Tenanted</td>
<td>Served</td>
</tr>
<tr>
<td>Existing &amp; New</td>
<td>Break Out Space</td>
<td>Public</td>
<td>Servant</td>
</tr>
<tr>
<td>New</td>
<td>Open Plan Office Platforms</td>
<td>Tenanted</td>
<td>Served</td>
</tr>
</tbody>
</table>

**Figure 7-4 Level 2 Floor Plan**
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Used For</th>
<th>Serviced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>Cafe &amp; Cafe Kitchen</td>
<td>Public</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Exhibition</td>
<td>Public</td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Multipurpose ie farmers market, art classes</td>
<td>Rentable</td>
<td>Served</td>
</tr>
<tr>
<td>Existing &amp; New</td>
<td>Meeting pods</td>
<td>Rentable</td>
<td>Servant</td>
</tr>
<tr>
<td>Existing &amp; New</td>
<td>Break out space</td>
<td>Public</td>
<td>Servant</td>
</tr>
<tr>
<td>New</td>
<td>Open Plan Office Platforms</td>
<td>Tenanted</td>
<td>Served</td>
</tr>
</tbody>
</table>
Figure 7-6 Level 4 Floor Plan

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Rentable</th>
<th>Tenanted</th>
<th>Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>Retail/Gallery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing</td>
<td>Studio/Office Facilities</td>
<td>Tenanted</td>
<td></td>
<td>Served</td>
</tr>
<tr>
<td>Existing</td>
<td>Meeting pods</td>
<td>Rentable</td>
<td></td>
<td>Servant</td>
</tr>
<tr>
<td>New</td>
<td>Open Plan Office Platforms</td>
<td></td>
<td>Tenanted</td>
<td>Served</td>
</tr>
</tbody>
</table>
Figure 7-7 Level 5 Floor Plan

<table>
<thead>
<tr>
<th>New</th>
<th>Residential Studio Apartments</th>
<th>Private</th>
<th>Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>Studios</td>
<td>Tenanted</td>
<td>Served</td>
</tr>
<tr>
<td>New</td>
<td>Short term rented office space</td>
<td>Rentable</td>
<td>Served</td>
</tr>
<tr>
<td>New</td>
<td>Cooking School</td>
<td>Public/ Rent</td>
<td>Served</td>
</tr>
<tr>
<td>New</td>
<td>Roof Terrace</td>
<td>Public &amp; Private</td>
<td>Servant</td>
</tr>
<tr>
<td>New</td>
<td>Plant</td>
<td>-</td>
<td>Servant</td>
</tr>
</tbody>
</table>

DIRTY LAUNDRY
DESIGN STRATEGIES
Existing and the New

‘Every design made in the context of existing structures will need to address the issue of how new additions connect with or differentiate themselves from what already exists.’\textsuperscript{101} In the case of the Laundry Building the architectural solution is clearly different from, yet constantly references the existing building and context. It responds to rhythm, proportion, mass and floor level alignment as well as driving factors of function, spatial composition and solar conditions.

The existing building is primarily concrete, expressing a roughness and sense of permanence. The texture of timber formwork engrained in the concrete, subtle cracks in the floor and smooth dips from previous wear all add richness and contribute to the patina of the building and are to be left exposed as part of the design aesthetic. The raw, down to earth nature of the existing building will be continued in the adaptations and interventions. This will be achieved through the detailing and selection of materials with a preference for those that transmit light and are durable, lightweight, unpretentious, industrial and agrarian. These may include perforated sheet metal, wire mesh, corten steel, rough natural timber and insitu concrete.

In order to facilitate the change in use and achieve the desired performance, new elements have been inserted. These include stairs, lifts, toilets, meeting pods, tenancy partitions, building services and a circulation spine with traversing bridges. Along with the existing building, these will be expressed and visible, adding additional layers to the building and to the story of its evolution.

‘What makes conversion attractive from a design perspective is precisely this integration of different historic layers. The new component does not establish an autonomous and independent meaning but always a dialogue with the existing elements.’\textsuperscript{102}

The language of layering and exhibition is further reinforced with the suggestion that the building acts as a canvas for displaying work and as a billboard for advertisements and promotions of films, exhibitions and classes, layer upon layer.

\textsuperscript{101} Cramer and Breitling, Architecture in Existing Fabric, 137.
\textsuperscript{102} Schittich, ed. Building in Existing Fabric, 17.
Atrium

A key initiative of the design is the conversion of low quality floor space in to an atrium which spatially represents a "nave" and "double transept." This unifies all elements of the building; the existing building, the west annex and the vertical extension, and has economic, environmental and social benefits.

"By definition, refurbishments incorporating selective demolition would generally result in a reduction in the overall quantity of useable floor space. From a commercial standpoint this reduction will need to be compensated by an increase in the 'use value', 'rent value', and/or 'asset value' under the building's new uses."\(^\text{103}\) In this design, while the atrium will initially reduce tenantable floor area, it is intended that it will generate economic benefits as a result of enhanced tenancies and be offset by additional floor area in the extensions. The organisation of the atrium enables tenancies to be separated from the central circulation spine, increasing security and privacy whilst still maintaining visual amenity and enabling the occupants to open onto the atrium creating desirable individual balconies. Tenancies also receive both internal and external outlook with a minimum of dual aspect and have increased levels of user control.

An intention was also to create an architecture which promotes community, collaboration, belonging and visual awareness. The atrium contributes to this by enabling occupations, tenancies, events and exhibitions to occur on multiple levels whilst maintaining a sense of connection.

The atrium is perhaps the single most important contributing factor to the environmental strategy and drastic improvement of the internal environments. Diagrammatic sections on the page 68 - 69 portray how the building and atrium respond in summer and winter.

Figure 7.10 Diagrammatic Section: Atrium Visual Connectivity

\(^{103}\) Kincaid, Adapting Buildings for Changing Uses, 56.
In order to respond to solar conditions, functional organisation and facilitate the environmental strategies of the atrium the roof became a key design element.

The atrium roof “kicks up” in contrast to the primary roof line of the proposal which follows the slope of the topography. The design supports the active building services systems as well as facilitating passive design strategies such as stack effect ventilation and cross ventilation. It acts as a ‘chimney’ exhausting warm air, and uses negative pressure to draw used air away from the tenancies which open onto the atrium. It ensure tenancies receive appropriate and required natural light with the ability to admit large quantities of indirect south light through the glazed louver bank. It also filters the northern light between the photovoltaic cells which are designed to be incorporated and showcased in an integrated and efficient manner (discussed further in Building Services).

The roof draws particular attention to the atrium and the strategies which have been employed. It establishes the atrium as a feature, signalling the spatial qualities and internal reconfiguration of the building, running uninterrupted the full length of both the existing building and the west annex it unifies the scheme from both interior and exterior.
Figure 7-12 Building & Atrium Strategy Summer
Figure 7-13 Building & Atrium Strategy Winter
Circulation

Circulation is a key design element that is organised according to movement flows, public and private, permanent and semi-permanent. A central ‘spine’ is situated in the centre of the atrium, running the length of the building and organises the circulation of both people and building services. This forms a ‘permanent’ component, accommodating the largest volumes of circulation. This primary route then ‘branches’ out, providing a secondary level of circulation to tenancies. These branches are ‘semi-permanent’ and are able to be reconfigured, interchanged or extended. This provides flexibility and adaptability to accommodate changes in current and future use and also enables tenancy lines to fluctuate back and forth.

The horizontal circulation is connected by stairs and lifts within the atrium. The primary lift is a feature of the design located at the centre of the existing building. It is on primary access routes and lines of entry, providing a strong vertical element which connects the building and grounds the insertions. A glazed lift within an oversized mesh sleeve, curved in one dimension promotes movement and visual interest. It is designed to facilitate the growth of vines and creepers, literally signalling the ‘green’ and sustainable nature of the proposal at its heart as well as the positive benefits of vegetation within buildings.

Figure 7-14 Diagrammatic Section: Circulation
Figure 7-15 Diagrammatic Circulation Plans & Section
Served and Servant Spaces

A concept highlighted in the work of Louis Kahn and also seen in buildings such as the Lloyds Building or Pompidou Centre is the distinction between “served” and “servant” spaces. “Served” spaces are the “reason” for the building and the “servant” spaces, those parts of the building – lifts, stairs, toilets etc – that facilitate the use of the “served” spaces.

The atrium of the proposed development provides a 3dimensional grid as a means of organising all of the facilities and services required to “serve” the buildings’ occupancies. These include stairs, lifts, toilets, break out spaces, meeting pods, exhibition and services. It enables the tenant/occupied spaces to be as effective as possible as the inclusion of “servant” elements, such as meeting pods, within the atrium, removes the need for these in individual tenancies, establishing an amenity that is available for all to use.
Structure

In adaptive reuse projects, initial investigations and evaluations are fundamental to establish the construction method, structural integrity and seismic requirements for the existing building.

Working with a structurally sound building is advantageous, however, there are many options available for strengthening and seismic upgrading. Techniques are commonly related to the upgrading or replacement of foundations, introducing additional structure such as shear walls or cross bracing to accommodate both seismic and gravity loads, or the strengthening of existing structure through techniques such as “wrapping” existing columns with additional reinforced concrete or carbon fibre.\(^{104}\) Decisions, whilst often linked to costs and efficiency, may also be influenced by aesthetic considerations and whether the intention is to express or conceal structural work.

Section 112 of the Building Act (2004) requires that ‘for any alteration, the building shall continue to comply with the structural provisions of the Building Code to at least the same extent as before the alteration.’\(^{105}\) This means that alteration work cannot weaken the building. Extra building strength would therefore be required where structural elements are to be weakened or if significant additional mass is to be added.

In 2005, Holmes Consulting Group, after carrying out a seismic evaluation, produced a report verifying the structural integrity of the Laundry Building.\(^{106}\) ‘In general the evaluation indicated that for its age and construction type the existing building performed well.’\(^{107}\)

\(^{104}\) Personal Communication, Structural Engineer, Stuart Oliver of Holmes Consulting Group, September 2010


\(^{106}\) The report was to assess the impact of a development proposal looking to add a mezzanine in the existing roof space. The impact was considered to be ‘insignificant’ and it was considered viable with no additional structure required.

\(^{107}\) Oliver, "Seismic Evaluation - 58 Surrey Crescent, Auckland," E5-2. ‘Building drifts where (sic) less than one-half the allowable values and the existing concrete columns and beams had adequate plastic rotation capacity. All of the beam-column joints had sufficient reinforcing and the existing foundation appear to have adequate capacity to resist the design level earthquake loads.’
This report, and consultation with its author, has proved invaluable during this project. It has significantly expanded my understanding of the existing building structure, the implications of possible adaptive reuse strategies such as expansion and selective demolition, and the manner in which existing buildings can be adapted in their structural capacity to accommodate variation in existing load paths and increased loads.

The design intention is to express the structure of the building, including the primary concrete frame through the atrium and the additionally required structure. This is an aesthetic preference, increasing the complexity and interest of the atrium and building, telling a story about the history and evolution of the building as well as educating occupants, enabling them to ‘read’ the building.

Key design moves which require structural consideration and response include

- Selective Demolition - The insertion of an atrium.
- Building Extension - Horizontally & Vertically.

Whilst the existing building is structurally sound, the introduction of an atrium and the associated process of selective demolition results in a weakening of the floor diaphragms. As approximately 25% of floor area is removed per level, additional structure is required to combat the loss of rigidity to the overall building frame. This is provided by horizontal cross bracing at the atrium ends within the existing building.

In order to accommodate increases in gravity loads and requirements for lateral load resistance as a result of the vertical extension, additional structure is required. This is provided at lower levels by the shear wall capacity of the double height cinema and conference facility, providing strength in both the north - south and east - west directions and acting as a design feature for the

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108 This frame is required for the building’s overall rigidity however it also provides a level of insight into the buildings past and provides a clear visual representation of how the building structure works. The secondary beams which run East - West have been removed as their purpose was to support the floor and transfer gravity loads which is no longer required.
exhibition of work. Vertical cross bracing has also been included in the atrium as required. In order to reduce the loading requirements, the additional levels are to be timber frame construction with plywood bracing and will transfer loads to the ground via the existing frame construction.

The decision to extend to the west was partially driven by the capacity of the building to accommodate the change as the western facade consists of unreinforced masonry brick infill. This can be removed and the building extended to make use of the land and gain valuable floor area without causing detriment to the existing building structure. ‘It is understood that the infill walls were used along the western facade to allow for planned future expansion of the building.’

The west annex and the underground car park on the north site are both proposed in concrete moment frame construction with Interspan flooring. This can span the required distances, is aesthetically pleasing and can be constructed on site without requirements for a large crane which is an important consideration for infill sites such as this. The annex has an independent structural system which is connected to the existing building through a subsidiary north-south atrium. This is intended to be an independent component with seismic joints allowing for the movement of both structures and providing visual and physical separation. ‘From a construction point of view, a movement joint is essential as new building constructions have different internal movement dynamics to old, settled building structures.’

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110 Cramer and Breitling, Architecture in Existing Fabric, 151.
Envelope

Building envelope ‘must fulfil a multitude of vital functions and is a principal factor in the energy consumption of a building.’ Given the increased knowledge and technical advances since the time of original construction it is not uncommon for changes or additions to be made to enhance an existing building’s envelope. This provides an opportunity to help bring the building up to contemporary standards; upgrading and improving the internal environment, moderating temperature variation, enabling user control, responding to climate, providing light and ventilation as well as addressing the building’s architectural expression.

Techniques which are used to improve the envelope of existing buildings may include upgrading (repainting the facade, additional insulation, maintenance or upgrade of existing systems), replacing (creating new openings or reducing existing openings, door and window replacement, replacing the existing building envelope) or adding additional layers (adding an additional layer of windows, over-cladding, an innovative second skin, adding solar control and sun shading, wind deflectors or rain screens). All alternatives have positive and negative attributes which need to be evaluated in accordance with the constraints of the project. It is important to consider the architectural style, desired continuity or differentiation and the extent of intervention, as these are likely to have an impact on the techniques selected.

The Laundry Building has 1.2 metre high spandrel panels at each level on the north, east and south facades, providing significant lateral load resistance, and brick infill on the west. There is no solar shading or control.

The proposed design retains the existing spandrel panels and original timber framed fenestration\(^\text{112}\) to avoid additional structural requirements; this also maintains a degree of building character and embodied memory. In order to improve the building’s performance, additional technologies are to be retrofitted enabling the control of dominant climate conditions such as solar gain and wind. Whilst this is a relatively low tech solution, it is believed it has the potential to make significant improvements to the internal environment. All interventions will appear as clearly retrofitted, adding another layer to the building.

The design also looks to utilise existing openings where appropriate, minimising the level of change to the envelope and avoiding further structural work. Examples include using the existing garage door opening to the north east to facilitate outdoor flow from the cafe, and garage doors on ground level becoming the points of entry on both the south and west.

Given the nature of climate, occupancy and surrounding context different facades present different challenges, resulting in an exploration of different alternatives and the selection of different solutions.

\(^{112}\) The existing windows are in good condition, have been well maintained and undergone a high level of work recently. Whilst the proposal looks to maintain the existing openings for reasons of structure and continuity the existing windows contribute to inconsistent temperature variation and high levels of heat loss and heat gain. As such a level of treatment will be required, the preferred option is to double glaze the existing windows if possible, alternately they may have to be replaced in order to establish a building envelope with increased efficiency and reduced temperature variation.
North -

Of the existing four storey building, the north elevation consists of 2 levels underground. The upper two levels (Level 3 & 4) tend to overheat in summer and are equipped with limited means of solar control. As north is a primary public access route there is value in a solution which is approachable, provides interest, visual amenity and enables people to look in and see the exhibitions and building.

Numerous alternatives have been explored including a range of louvres (varying spacing, size, materiality), fixed or pivoting “eyebrows,” external roller blinds and combinations of the above. The selected solution is horizontal sun shading fixed above the existing window openings to exclude summer sun whilst allowing winter sun to penetrate deep into the floor plate and heat the exposed concrete slab. This sun shading is generated in response to the existing windows, divided at the window transom to enable a smaller and more responsive solution. These are accompanied by internal venetian blinds to enable increased occupant control and the reduction of glare.

The residential apartments in the vertical extension employ a similar principle. The roof overhangs provide primary solar control, accompanied by occupant controlled horizontal sun shading. In addition to design for solar control, the sun shading elements for the existing building and the residential apartments have been sized in accordance with each other, establishing a dialogue and breaking down the existing 6m and 4m bays, continuing rhythm whilst quickening the pace.

East -

The eastern facade remains largely unchanged, aside from the middle bay which is to become glazed, indicating the atrium and facilitating the extension of a mesh encased stairwell housing the egress route and local VAV plant. Solar control will be achieved by the roof overhang, filtering mesh and internal blinds.
South –

The predominant south westerly wind moves up the gully of Great North Road and contacts the four storey elevation of the existing building. This, along with other contributing factors, results in a loss of valuable heat, particularly in winter. Several solutions have been considered in an effort to deflect the wind and reduce direct contact with the building envelope. Additionally, whilst the south west is the predominant wind direction, it is also the direction of a desirable view. This suggests glass louvres, perforated screens or similar may provide a solution, deflecting or reducing the wind whilst maintaining visual amenity.

West -

The western facade of the existing building is currently brick infill which is to be removed, facilitating the extension. This establishes the west elevation as a component of the annex. The main concerns are the control of afternoon summer sun, enabling views of the suburban landscape and towards the Waitakere Ranges to the south west, as well as controlling the outlook on to the neighbouring property. Pivoting vertical louvers are proposed, enabling occupants to control both sun and views. It is also proposed to have a light mesh screen at the western perimeter enabling creepers and vegetation to grow. This will filter light, provide pleasant outlook, reduce the appearance of the neighbouring building as well as preconditioning the air before it enters the building.
Building Services

Building services are a key component in adapting buildings to meet contemporary expectations. They provide an opportunity to drastically improve internal environments, which can in turn reduce energy consumption, enable user control and provide healthier environments which have been linked to enhanced satisfaction and reduced absenteeism.

There are a range of key decisions which will influence the choice of system/s to be implemented in an adaptive reuse project. Two significant questions addressed at the outset included whether the building services system was to be concealed or expressed and if the system was to be passive, active or mixed mode. Different solutions will suit different building functions, spatial compositions and aesthetic considerations.

Services such as ducting, pipe work and cabling are a key visual feature of the atrium, adding to the layering of the building and the education and awareness of occupants. These elements can be read as distinct insertions within the building. The intention is to make a feature not only of the services elements within the building but also of the plant rooms as sculptural boxes located on top of the annex.

Figure 7-20 Expressed Services - Sovereign House
Image courtesy of Unitec’s Department of Architecture Technology 4 Course Resources 2009.
Implemented Systems

The adaptation of the Laundry Building promotes passive solar gain, natural light and natural cross and stack effect ventilation. Passive systems, in particular ventilation, perform at their optimum with floor depths of 5-7m.113 As the floor depths of the proposed design are 10-12m, a mixed mode strategy is proposed, complementing the passive strategies with the introduction of energy efficient and environmentally considerate active systems.

The design includes different spatial arrangements and as such three heating, ventilation and cooling (HVAC) systems have been employed to complement passive solar design and ventilation strategies.

- Multiservice chilled beams service the majority of tenancies, as well as open spaces such as exhibition and breakout spaces.
- Enclosed spaces such as the cinema, conference facilities and cafe kitchen, employ traditional variable air volume (VAV) systems facilitating quick temperature changes to accommodate varying demands and occupant numbers.
- Residential apartments are designed for passive solar gain and natural ventilation with underfloor heating to aid in the cooler months and solar hot water systems.

Given the design strategies employed, it is intended that the building will operate passively for at least 50% of the year and that it would operate using approximately 50% less energy for heating and cooling than a traditional air conditioned building of this type.114

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113 Personal Communication, Unitec’s Department of Architecture, Resident Services Engineer, Max Hynds, July 2010.
114 Ibid.
Chilled Beams

The primary system implemented in the building is an active, fresh air, multiservice chilled beam. This offers both heating and cooling as a result of two water reticulation systems, hot and cold, conditioned by heat pumps. The water is reticulated in a network of pipes running through the chilled beams. Fresh air is drawn in from outside (rather than preconditioned air) and passes over the water pipes and associated fins (either hot or cold), thus discharging fresh air into the room at the appropriate temperature. The air is then exhausted from tenancies via the atrium and expelled via louvres at the top of the atrium (i.e. summer) or returned to the plant. The system is designed to utilise heat recovery from the return air (this is particularly beneficial in winter and intermediate seasons).

Rationale for chilled beams

- architectural expression of services
- ability to be multiservice
- limited spatial requirements
- use of local renewable resources
- suits the atrium exhaust strategy
- works with natural ventilation
- does not require a raised floor plenum or suspended ceiling

Benefits

- estimated upwards of 50% free cooling utilising outside air (enthalpy)
- heating and cooling only applied at the point of use (avoids wastage)
- buildings pre cooled in summer using night purge
- winter heating via heat pumps with chiller reclaim and heat recovery
- heat pump performance coefficient of 4:1
Figure 7-23 Services Schematic
Fire

The building predominantly acts as a single fire cell and has sprinklers throughout as well as employing wet risers and drop down smoke curtains. This is further assisted by the louvre bank and smoke exhaust fans at the top of the atrium.

Photovoltaics

The roof of the atrium has been designed to incorporate photovoltaic cells in order to harness the sun’s light as a means to generate energy. This is angled at 36 degrees to provide optimum performance for the Auckland environment\textsuperscript{115}. The energy generated from these is transferred back to the mains, used within the building and, should the supply be in excess of requirements it can also be traded with the grid supply.

It is acknowledged that, in addition to generating energy, photovoltaics produce heat. Louvres to both the north and south of the cells will aid in warm air removal during summer months. In winter the heat will aid in heating the building and in the intermediate seasons the heat may be returned to the plant and the heat recovered and used elsewhere in the building.

Additional Systems

In order to further improve the internal environments, reduce energy consumption and promote sustainable practice, the following systems will also be employed.

- energy efficient lighting
- automatic temperature controls with manual override
- night purging
- heat recovery
- solar hot water
- harvesting, collection and reuse of rain water
- evaporative cooling, preconditioned air via vegetation and water

\textsuperscript{115} Relative to Aucklands latitude of 36.7 degrees.
Public Realm, Surrey Crescent

The potential inclusion of a public realm within the body of this scheme addresses a number of aspirations. It generates the opportunity to create a sense of place, something absent from this Surrey Crescent site at present, and it also reinforces the ambition for the site to look beyond its own boundaries, providing amenity and potential rehabilitation for the surrounding community and adjacent sites.

Several features of the vacant land to the north of the Laundry Building suggest its suitability as a public realm. These include its solar conditions, placement on a connection route through the site and the street frontage for access and visual awareness. Furthermore, the creation of a public space has the potential to act as a satellite to the building, activating the land and encouraging public use as well as retaining the visual connection of the building from Surrey Crescent.

This land has been developed in conjunction with the Laundry Building to accommodate a primary use of the Grey Lynn Farmers’ Market. This is supplemented by provision for local artists and tenants to work and exhibit (both rented by the precinct occupants and subsidised for the local community) and a landscaped plaza for the local community to utilise on a day to day basis, aiding social cohesion.

This public realm, whilst not the priority of the research question, has been considered and designed alongside the development of the existing building in order to establish a congruent solution carried out with the same thinking and objectives of the overall proposal.

In order to accommodate the farmers’ market and associated uses a range of facilities are required. These include water access, storage, public toilets, canopies and stalls which have been provided for. It is also beneficial to have large flat surfaces, as such the currently sloping site has been terraced into four ‘zones’ with a gradual, stepped transition between the initial three zones and a steeper change in level at the fourth zone, closest to the existing building. This arrangement creates a

116 Which has become too big for its current location at the Grey Lynn Community Centre.
definition of different spaces and a degree of enclosure for the exterior space directly adjacent to the existing building. The banking of the land also provides seating to suit an outdoor cinema and creates provision for underground car parking below the plaza minimizing the impact of the car, improving site utilization and design flexibility.

I recognise that this may not be a developer’s primary option due to the economic viability. However given potential benefits for the community it could developed in conjunction with the local council or other stakeholders under a memorandum of understanding, or a strata title.
8. CONCLUSION

'It is good to have an end to journey towards, but it is the journey that matters in the end.'

Ursula K. Le Guin
I have had a long standing interest in history which led me to architecture where I became increasingly aware of the importance of our building stock and the impact architecture can have on individual and communities. This facilitated my interest in adaptive reuse and sustainability as alternatives to demolition. This project provided the opportunity to bring these interests together.

A critical review of current knowledge and practice of adaptive reuse and sustainability confirmed the availability of a considerable quantity of literature on both topics (sustainability, in particular) and that both are becoming established as well utilised and respected practices. Furthermore, sustainability is inherent in, and a primary motivation for, adaptive reuse; and sustainable design principles, strategies and techniques can be applied to existing buildings — thus I assert that my proposal for their combined application is validated. Yet despite this, and the increased benefits of their integration, there is currently a paucity of writing on their combined application. An important aspect of this research project has been to combine and attempt a synthesis of existing research from both frameworks.

Concurrently, I developed a comprehensive design proposal for the development of the former Auckland Laundry Building in Grey Lynn as a mixed-use creative precinct. This demonstrates the potential of adaptive reuse as a sustainable development option and a viable alternative to demolition and replacement. The resulting adaptively reused and augmented building is, in my opinion, at least the equal – in performance and environment – of a new building that might have replaced it; with the significant benefits of having conserved energy and preserved memory. The design consists of the existing building, a vertical extension and a new annexe. It involved the research and implementation of an ‘anthology’ of adaptive reuse strategies. The design seeks to actively portray the process of adaptively reusing an existing building in a sustainable manner; in a way that clearly distinguishes the new work from the existing. In my opinion, the most significant feature of the new work is the atrium which incorporates both pragmatic and spatial values, significantly enhancing the internal environments.

An overall objective of this research project was to raise awareness of adaptive reuse as a viable development strategy and its potential for integration with sustainable design practice. In
making explicit the process I followed, I believe this has been achieved. The research project – writing and design together - presents a number of timely ideas, propositions and explorations relevant to architects, developers, planners, property owners and territorial authorities. It is hoped the research project findings will be made available through publication, presentation, and consultancy.

All the research project objectives (as stated in the Introduction) have been achieved and following submission of this document, design work will continue for the next three weeks. Whilst the overall intentions have been resolved and will remain unchanged, refinement of design and detailing will continue during this time.

Further Research
There is potential for further research at two levels; the formulation of a decision making framework, and the detailed testing of solutions.

The paucity of literature on the combined application of adaptive reuse and sustainability posed difficulties in design resolution. There was uncertainty regarding which aspects to consider, where to start, what decisions were required and in what order to do things in order to achieve the desired outcome. This suggests that further research is required to develop and evaluate a decision making framework to guide practice. This would be beneficial in assisting people to visualise and navigate the implementation of sustainable practice in adaptive reuse. In addition to contributing to individual projects it would also contribute to the paradigm shift that is needed.

There are a multitude of solutions available when exploring the integration of sustainable practice in adaptive reuse e.g. retrofitting solar control. I propose further research be carried out to evaluate the effectiveness of these solutions in adaptive reuse. The documentation of such research and associated results would act as a valuable tool for those selecting solutions, providing evidence and enabling comparison.

"... research is always incomplete."
[Mark Pattison, English educationalist (1813-1884)]
9. APPENDICES

'No problem can be solved by the same level of consciousness that created it.'

Albert Einstein
Appendix A: Critical Review of Current Practice - Precedent Studies
CarriageWorks, Sydney, Australia
Axis Building, Auckland, New Zealand
Heards Building, Auckland, New Zealand
Sovereign House, Auckland, New Zealand

Appendix B: Further Critical Review of Sustainability
Climate Responsive Architecture
Contemporary and Mechanical Technologies
Regenerative Development
Current Evaluative Means

Appendix C: Register of Creative Industries, Grey Lynn

Appendix D: Final Presentation Drawings
Appendix A: Critical Review of Current Practice – Precedent Studies

The review of current practice through precedent studies was important in informing writing and design. They enabled a greater understanding of how similar projects have been carried out, providing an opportunity to draw comparisons and understand both the positive and negative implications of decisions.

Below I have briefly drawn attention to four examples from a selection of precedents which have informed and influenced my process. They have all been experienced personally and provide different experiences with a mixture of strengths and weaknesses.

CarriageWorks, Sydney, Australia
Carriage works is an example of an old industrial building with a huge amount of history and richness in materiality. It is very dirty and raw yet beautiful as a result. It explores the strategy of ‘inside out’ having significantly changed the interior whilst the exterior is primarily the same. The complex is a series of gables sheds which have all been opened onto each other on the inside with expressed structure defining space. The interior has a large volumes inserted within it to define spaces with specific uses such as an event hall and cafe. The remainder of the ‘left over’ space is open to the public and often holds events such as designers markets. This complex also hosts a local community market on the weekends under a large gable canopy at the front of the building.
Axis Building, Auckland, New Zealand
The Axis building is an early and still appreciated example of adaptive reuse in Auckland. The deep floor plates were combated by the introduction of a large central courtyard. The tenancies operate on the four sides around this with an open circulation path on the perimeter of the courtyard which serves these. There is a central bridge which spans across the courtyard and the ground level includes a cafe/restaurant however aside from this it appears to have limited activation. Whilst the space is protected from the wind it is open to the elements of rain.

Heards Building, Auckland, New Zealand
The Heards Development in Parnell is an example of adaptive reuse whereby the existing building (originally the Heards sweet factory from the early 1900's) was larger than would be allowed by town planning if the site was to be developed from scratch. As such the building, on a prominent corner site, was retained. The design created an atrium in the centre and the top level was converted to residential. However the atrium seemed to be a missed opportunity as the space is small with low level of visual amenity up and amongst the building. You are unable to grasp a sense of the spatial volume as it is cluttered. This is an important consideration during the development of the atrium in my proposal.

Sovereign House, Auckland, New Zealand
Whilst not an adaptive reuse project, Sovereign House formed an influential precedent for its overall strategy of community and expression. It is a multi level building that operates on three distinct floor plates with generous open plan offices. The central floor plate includes a very large and generous atrium (this is a completely different experience to the Heards or Axis Buildings). This provides visual connection throughout the building with the intention of creating interactions. The ground level forms the kitchen and the heart of the proposal. Sovereign House was also a key influence in the consideration of structure and services relative to their expression.
Appendix B: Further Critical Review of Sustainability

Climate Responsive Architecture

This section explores the relationship between buildings and their environment, how this has changed over time and the architectural techniques which enable an architecture that is able to adapt and respond to its context, climate and environment.

There are numerous publications on sustainable design which address energy savings, low energy buildings and passive solar design. However, ‘very few are based on an analysis of local climate conditions or seek to explain the silent knowledge accumulated over generations in the way different architectural traditions are adapted to climate.’

The relationship of use, control and climate is common in vernacular architecture but is often neglected in modern practice. We have moved towards standardisation; internal environments which strive for conditions such as 22°C, 50% relative humidity and two air‐changes per hour, irrespective of the exterior climate. This suggests the appearance of buildings can also be standardised, resulting in a loss of the vernacular and a style of building that does not vary whether in Auckland or Bangkok.

Torben Dahl addresses this, noting that:

‘Whether located in tropical climates where shade and cooling are desired, or in the arctic climates where heating and light are required, the solutions are generally dominated by the use of high energy consuming climate control systems. These provide fresh air, appropriate levels of temperature and humidity, thereby ensuring comfort, but fail to exploit an alternative tradition based upon more responsive climatic design strategies.’

129 Ibid., 6.
130 Ibid.
131 Ibid., 5.
This neglect of the external environment results in high energy consumption as well as depriving occupants of the benefits of natural ventilation, light and the external environment. Douglas Farr addresses the need for these:

'Human life is not viable and human health is not possible without manifold free services provided by the Earth. The Earth receives sunlight, cleanses water, makes oxygen, and grows plants that feed humans and other animals. Humans evolved outdoors, immersed in natural vegetated habitats, exposed to sunlight, fresh air, and water. Biophilia is the name given to the human love of nature based on this intrinsic interdependence between humans and other living systems.'

Evolution has also seen us equipped with senses which permit us to ‘both experience and interpret impressions of climate and instantaneously control the state of our bodies in response to undesired influences. Buildings do not, however, work in this fashion and often they do not respond to their respective climates. There are a variety of climates throughout the world including variations of hot, moderate and cold.

This was addressed by Vitruvius, over two thousand years ago, in his Ten Books on Architecture:

‘If our designs for private houses are to be correct, we must at the outset note of the countries and climates in which they are built. One style of house seems appropriate to build in Egypt, another in Spain, a different kind in Pontus, one still different in Rome, and so on with lands and countries of other characteristics.’

Climate responsive architecture can enable an architecture which is informed by its location, creates more comfortable spaces, respects the vernacular, reduces the demand for high energy consuming mechanical technologies, enables occupant control and facilitates a building with the capacity to change and adapt according to the time of day, month and year.
These techniques can include orientation, climate screens, transition space, sun shading, ventilation, thermal mass, thermal envelope, thermal insulation and the ability to adapt and change according to climate.

Contemporary and Mechanical Technologies

This section provides a brief overview of the progress and availability of technologies which have been developed following the consciousness of and global trend for sustainable buildings. Two types of technology relative to the built environment are those which use energy to moderate environments and those which use the environment to generate energy. As publications primarily address methods for new construction I have explored the suitability of introducing these technologies to existing buildings, which often seems plausible, either by retrofit or replacement.

Technology is constantly evolving and, whilst it can be detrimental to the environment, it also has the potential to create more sustainable buildings. The Intergovernmental Panel on Climate Change’s (IPCC) Fourth Assessment Report found that, with proven and commercially available technologies, energy consumption in both new and existing buildings could be cut by an estimated 30-50 per cent without significantly increasing investment costs.¹³⁵

Those technologies which use energy to moderate, control and influence environments are heating, cooling and ventilation systems. These include heat pumps, air conditioning, chilled beams and displacement ventilation. Many of these technologies have been around a long time, however, they are under constant revision; resulting in increased efficiency and reduced pollutants, improving their environmental impact.

Technologies which utilise the climate and environment to generate energy such as sun, wind and water include photovoltaics, wind turbines, geothermal heat pumps and hydro. Technology in this realm is progressing at pace and has significant potential; in one hour the sun produces more

energy than the entire human civilisation requires in one year,\textsuperscript{136} so why not harness this free and renewable resource? These technologies and techniques can include solar hot water, generating energy for use within the building and returning energy to the grid. Though these methods are currently costly, ‘they have the potential to become inexpensive, mass market products. The amount of energy these technologies could generate is limited only by uptake and is, therefore, highly price sensitive.’\textsuperscript{137}

Advanced technology can be seductive and have a substantial influence on society; despite this, Peter Smith emphasizes that it is important not to install hardware that greatly exceeds the real demands of the building and its occupants. ‘The technological fix should be avoided and designers should aim to install essential technology that is efficient, not over complex, easy to use and maintain.’\textsuperscript{138}

\textsuperscript{136} Yann Arthus-Bertrand, "Home," (France: Elzevir Films / Europacorp, 2009).
\textsuperscript{137} Bill Dunster, Craig Simmons, and Bobby Gilbert, The Zed Book (Oxon: Taylor & Francis, 2008), 41.
Regenerative Development

Regenerative development was a key strategy identified for New Zealand development in the 2009 reports ‘Rethinking our built environment’\textsuperscript{139} and ‘Towards a more Sustainable Future’\textsuperscript{140} by the Ministry for the Environment.

Regenerative development departs from the thinking that the best a building can be is environmentally neutral and offers improvements in the health and well-being of humans, other living beings and ecosystems.\textsuperscript{141} It addresses sustainability holistically; social and economic as well as environmental. Regenerative development strives above and beyond rating tools, it is looking to the future rather than simply the present.

In regenerative development, the built environment becomes a conduit for producing resources and energy, improving physical and psychological health, remedying past pollution, and transforming and filtering waste into new resources.\textsuperscript{142} It represents a fundamental rethinking of architectural and urban design.

‘Buildings are not considered as individual objects, but rather are designed to become parts of larger systems, allowing complex and mutually beneficial interactions to occur between the built environment, the living world and human inhabitants. This ensures a constantly dynamic, responsive and resilient built environment evolves over time, and is a key difference between regenerative and eco-efficient development.’\textsuperscript{143}

\textsuperscript{140} Zari, “Towards a Sustainable Future.”
\textsuperscript{141} Ibid., 6.
\textsuperscript{142} Ibid.
\textsuperscript{143} Ibid.
Current Evaluative Means

Throughout the world, evaluation tools and criteria have been established in order to explore the success or degree to which the built environment is achieving sustainability. However, as these are relatively new, little has been written on them and there is ranging opinion, both positive and negative.

Evaluation is often carried out in accordance with a set of criteria or matrix, giving the project a rating. Prominent evaluation tools include BREEAM (Building Research Establishment Environmental Assessment Method) which is operational in the United Kingdom and Netherlands, LEED (Leadership in Energy and Environmental Design) which operates in the USA, Canada and India, and Green Star in Australia, New Zealand and South Africa. The Australian criteria were adapted for New Zealand.

According to the 2009 World Green Building Council Report, 50 per cent of new and major refurbished office buildings in New Zealand undergo Green Star certification.\(^{144}\) Whilst evaluation criteria are important, setting benchmarks and encouraging people to strive for excellence, it has been considered by some as only setting minimum standards in order to control those who are not performing well.

Furthermore, the NZGBC Green rating is not a holistic evaluation; it is yet to have entire life cycle analysis, it lacks holistic environmental, economic and social considerations and only recently incorporated any acknowledgement of working with existing buildings or materials. ‘If we wish to assess the sustainability of a building in the objective world, all of its relevant life cycle implications must be considered.’\(^{145}\)

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Appendix C: Register of Creative Industries, Grey Lynn

The following is a register of creative industries within the suburb of Grey Lynn reinforcing the diverse and arty nature of the suburb. It is hoped that the creative precinct would attract interest from all facets of the creative industries as well as those interested in the community and sustainability sectors.

Amplifier Design Ltd
17 Pollen St Grey Lynn, Auckland, 1021
Graphic Designers

Art Bureau NZ Ltd
9 Kirk St Grey Lynn Auckland 1021
Art Galleries

Art Associates
37 Scanlan St Grey Lynn Auckland 1021
Art Hire & Consultancy

Architects Process Consultants
9 Kirk St Grey Lynn Auckland 1021
Architects

Architect - Registered Architects
PO Box 78046 Grey Lynn
Architects

Big Fish Design
58C Sackville St Grey Lynn Auckland 1021
Architectural Designers

Brasell + Ojala
302 Great North Rd Grey Lynn Auckland 1021
Interior Design

Campbell Architecture Limited
PO Box 78058 Grey Lynn
Architects

Chuah Design Ltd
17 Allen Rd Grey Lynn Auckland 1021
Graphic Designers

Clikka
7/4 Niger St Grey Lynn Auckland
Web Site Development
Creative Practice
Top Floor 172 Richmond Rd Grey Lynn Auckland 1021
Graphic Designers

Curious Design Consultants Ltd
1 Turakina St Grey Lynn Auckland 1021
Graphic Designers

Digital Stream Ltd
300 Richmond Rd Grey Lynn Auckland 1021
Web Site Development

El Framo
16 Pollen St Grey Lynn Auckland 1021
Interior Design

Federation Media Limited
23 Pollen St Grey Lynn Auckland 1021
Web Site Development

Glasgow Architects
37 Scanlan Street Grey Lynn Auckland 1021
Architects

Ice Interactive
34 Westmoreland St West Grey Lynn Auckland
Web Site Development

Image Centre
34 Westmoreland St West Grey Lynn Auckland
Website design & Printing

Inform Design
1 Sackville St Grey Lynn Auckland 1021
Interior Design

Lemonade Design & Advertising
401A Richmond Rd Grey Lynn Auckland 1021
Advertising Agencies

Maggie Bryson Interiors
37 Scanlan St Grey Lynn Auckland 1021
Interior Design

McElroy Architecture
9 Kirk St Grey Lynn Auckland 1021
Architects
Moonbase Design Ltd
25 Arnold St Grey Lynn Auckland
Graphic Designers

Pacific Shack
7 Dryden St Grey Lynn Auckland 1021
Graphic Designers

Pohio Adams Architects
9C Kirk St Grey Lynn Auckland
Architects

Slice Image Makers
401a Richmond Rd Grey Lynn Auckland
Advertising

Spitfire Creative
60L Surrey Cres Grey Lynn Auckland 1021
Graphic Designers

Stream Interactive Ltd
Level 1 194 Gt North Rd Grey Lynn Auckland 1021
Web Site Development

Trish Clark Art Consultancy
167B Great North Rd Grey Lynn Auckland 1021
Art Hire & Consultancy

Tully and Gardener
139 Richmond Rd Grey Lynn Auckland 1021
Landscape Design

Underground Creative Ltd
85 Wellpark Ave Grey Lynn Auckland 1021
Jewellers & Watchmakers

Uno Design 2004 Ltd
35A Surrey Crescent Grey Lynn Auckland 1021
Interior Design

Wall
16 Pollen St Grey Lynn Auckland 1021
Art Galleries

Web Widgets Free Website Builder
14/386 Richmond Rd Grey Lynn Auckland 1021
Web Site Development

Zephyr Wpd Limited
14 Maidstone St Grey Lynn Auckland 1021
Advertising Agencies
Appendix D: Final Presentation Drawings
Atrium Model 1:100
10. BIBLIOGRAPHY

‘If I have seen further it is only by standing on the shoulders of giants.’

Sir Isaac Newton


Committee on Terminology. "Quebec Association for the Interpretation of the National Heritage." 1980.


"Passivhaus." http://www.passiv.de/07_eng/index_e.html


DIRTY LAUNDRY

The adaptive reuse of an existing building

An explanatory document submitted in partial fulfilment of the requirements of the degree of Master of Architecture (Professional)

Unitec Institute of Technology, 2010

Hannah Penlington