CRITICAL PLACEMAKING

Critical regionalism in an increasingly globalised world.

Anna Bulkeley 1370216
Critical regionalism is a progressive approach to design that seeks to mitigate the impact of globalisation on regional identity. It is a strategy used to intercede between the global and local languages of architecture.

"Ten Points on an Architecture of Regionalism: A Provisional Polemic," by Kenneth Frampton formed a key theoretical framework for this project, for which design resolutions were ultimately sought.

The central idea was to apply the theories of critical regionalism to the architecture of an international airport terminal so as to develop an iconic place-maker, where travellers share an experience of place and a sense of belonging.

It was important to understand the operational exercises that define an airport and, concurrently, its critical role in today’s globalised society. Further exploration sought to understand and define what it is today to be a New Zealander and how these cultural characteristics can be applied to an airport typology.

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Also, thank you mum, for everything, as always.
1.0 INTRODUCTION

1.1 RESEARCH QUESTION

Critical Placemaking: Critical regionalism in an increasingly globalised world – In the current climate of globalisation, how can a space become an identifiable place, whilst utilising the current theory on critical regionalism?
1.2 PROJECT OUTLINE

Critical regionalism can be described as a fundamental strategy to mitigate the impact of globalisation; a strategy that houses components deliberately roused “from the peculiarities of a particular place”\(^1\), whilst preserving an acute level of critical self-awareness. Further, it is a progressive approach to design that seeks to intercede between globalised and regional inflections of architecture where we would otherwise risk losing our sense of identity, community and place.

With this in mind the project seeks to establish the needs required to formulate a sense of place and belonging within the confines of an international airport terminal in Auckland. To achieve this it was necessary to examine at length the terms of critical regionalism and globalisation, their defining qualities, the application of such, and to look to understand and explore these through the development of an airport terminal.

Kenneth Frampton’s seminal work “Ten Points on an Architecture of Regionalism: A Provisional Polemic,” \(^2\) first published in 1987 formed a key theoretical framework that began to elicit an appropriate architectural response for this project.

The central idea was to apply the theories of critical regionalism to the architecture of the airport terminal so as to develop an iconic place-maker, where travellers share an experience of place and a sense of belonging. Therefore, the project requires an understanding of the operations of an airport and its development as a defining element of modern life. Auckland Airport moves over 14 million passengers per year, yet is generic in its presence – there is little cultural bias in terms of Māori and ‘New Zealandness’, as it sits subsumed by global retailers.

The proposed international terminal seeks to engage with the domestic terminal and would utilise existing infrastructure and airside facilities, including runways, cargo area and control tower. The terminal will however require public and airside amenities, airline lounges, customs and

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\(^2\) Ibid., 375.
immigration facilities, baggage screening, arrival and departure areas. The subsequent stage of the project involves investigating ideas that link a space to its place. Critical regionalism attempted this in the 1980s through Frampton’s original work.

However, the most recent literature by Moore, Lefaivre and Tzonis, suggests that there are two current constants of regionalism. The first is the perceived opposition to modernism, more specifically the International Style, and the second ensures local identity is acknowledged to adhere “to the individual identity of regions,” within the borders of an island nation and as a wholly dynamic process. These elucidations ensure tradition is grounded within reality and not simply nostalgia, and further, that regionalism becomes embedded in a self-gratifying, yet global system of physical, social, ecological and cultural synergies.

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1.3 AIMS and OBJECTIVES

This project identifies suitable and contemporary definitions for critical regionalism and globalisation, through the collation and understanding of appropriate literature. This includes “Ten Points on an Architecture of Regionalism: A Provisional Polemic”\(^4\) by Kenneth Frampton and the more recent 2012 insights from Liane Lefaivre and Alexander Tzonis in their work “Architecture of Regionalism in the Age of Globalization.”\(^5\) Here they suggest that to evolve and sustain a sense of place we should be amplifying regional interdependencies that are “physical, social, cultural, and above all today, ecological,”\(^6\) rather than being “subordinated and flattened”\(^7\) by a globalised world.

This project endeavours to define and establish formal and spatial qualities inherent to a New Zealand regionalist culture and seeks to forge a national identity within our globalised and increasingly homogenised environment, based on advancement of the considered theory. The theory is applied accordingly to an appropriate architectural response, specifically an alternative international and domestic terminal at Auckland Airport.

The terminal attempts to enhance a traveller’s sense of arrival to, or departure from an international airport; particularly with the intention of bringing an energising quality to an otherwise prosaic procession of movement from one place to another, whilst ensuring the traveller is readily able to identify with the given location.

Finally, this project identifies the specific aspects of critical regionalism that contribute to developing a space that portrays a sense of place; one that identifies with people through commonalities such as culture, environment, community, space, technology and shared experience.

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\(^4\) Kenneth Frampton, “Ten Points on an Architecture of Regionalism: A Provisional Polemic,” 375-385.
\(^5\) Lefaivre and Tzonis, *Architecture in the Age of Critical Regionalism*.
\(^6\) Ibid., 199.
\(^7\) Ibid., 200.
2.0 PROJECT DEFINITION

2.1 THE PROBLEM

This document seeks to establish the needs required to formulate a sense of place and belonging within the confines of an international airport terminal in Auckland. To achieve this it was necessary to consider the essential designation of critical regionalism, its defining qualities, the application of such, and to look to understand and explore these through the development of the terminal.

The architectural research problem here is two-fold; the first deals with the airport and its cultural position in today’s global society. The second attempts to look at ways to connect the traveller with the place that they are departing or arriving to, and to bring excitement back to a journey which has become a dull and systematic part of contemporary society.

Conversely, this project does not attempt to reinvent the airport. Research indicates that airports currently have a variety of proven strategies in place in order to function efficiently, particularly in terms of
operations and finances. Furthermore, there are established systems and processes that must adhere to international standards and regional legislation and thus cannot be altered or governed by design.

Finally, this project avoids the inclusion of a New Zealand ‘theme,’ ensuring there is a minimum of kitsch and tawdry. The project alternatively provides an application of New Zealand’s unique and innovative culture to functional, spatial and structural considerations.

2.2 GLOBALISATION

Globalisation is a term that has been growing in use since the 1980s.\(^8\) It describes a process by which global and regional economies, societies and cultures have become integrated through an international network of trade, communication, immigration, technology and transportation.\(^9\)

Globalisation is a means of universal inter-connectedness and thus ensures social arrangements such as regionalist ideologies and values become dis-entrenched from their contextual framework. This is a consequence of accelerated globalism, originally contained within fields such as finance and economics. However, in current theory the term globalisation refers to a multitude of disciplines, political agendas and social theories, whilst subsequently encouraging global interdependence at the expense of regional identity.

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\(^8\) The term globalisation has been in use since the 15\(^{th}\) century when Europeans began to explore the world by way of transatlantic voyages. There is no evidence to suggest that the world economy was globally integrated prior to 1490 as suggested by Kevin H. O’Rourke and Jeffrey G. Williamson in *European Review of Economic History* (Cambridge: Cambridge University Press, 2002), 23-50.

This document refrains from hyped economic and political agendas and instead focuses specifically on architectural sameness as derived from the issues of globalisation. This is within the context of regional preference structures and the qualitative relations between different alternatives which have been relentlessly homogenised through the placelessness of modernism and the superficial historicism of much post-modernist architecture.\textsuperscript{10}

Globalisation has many symbolic gestures, none more so than conglomerates such as Coca Cola and McDonalds, but also includes representations such as international airports where the process of globalisation is exemplified on a daily basis. As British architect Robert Adam states, “Modernist association with the principal building types identified with key aspects of globalisation – the corporate office, the airport, the international hotel and the shopping mall provided a clear symbolic link with the engines of global capital expansion.”\textsuperscript{11} It can further be argued that globalisation ensures the loss and destruction of place by the generation of “non-places”\textsuperscript{12} which refers to interchangeable places of transfer and transit as seen within the international airport environment.

Globalisation itself is more far reaching than purely the demand for western capital and the consequential products, there have been attempts to localise identity through sociological, political and economic methods. It becomes apparent that the impact of critical regionalism can be seen as a powerful antidote for a globalised world.

\textsuperscript{10} Juhani Pallasmaa, \textit{The Eyes of the Skin: Architecture and the Senses} (Chichester: John Wiley & Sons Ltd., 2012), 99.
\textsuperscript{12} P. Herrle, et al., eds. \textit{Constructing Identity in Contemporary Architecture: Case Studies from the South} (Munster: Lit Verlag, 2009), 19.
2.3 CRITICAL REGIONALISM

The term critical regionalism was originally devised by Alexander Tzonis and Liane Lefaivre in 1981 and can be described as an essential strategy used to mitigate the impact of post-industrial globalisation, a strategy that encompasses elements directly derived from the “peculiarities of a particular place” whilst concurrently maintaining an inimitable level of expository self-consciousness.

Critical regionalism is not regionalism in the sense of vernacular architecture, it is much more a progressive and dynamic approach to design that seeks to intercede between the globalised notions and local languages of architecture. Critical regionalism acts fundamentally to negate the consequences of increasing globalisation where society risks losing its sense of identity, community and place. It further seeks to better identify with an area through its character, uniqueness and current environment, thus sanctioning a sense of place whilst aiming to sustain diversity “while benefitting from universality.”

Furthermore, critical regionalism should be positioned within the contemporary framework of a ‘place’. It must represent the immediate determinants of local life to ensure relevance of architectural design. It can be claimed that the population must feel at ease with such elements so as to reflect the “current conditions of culture in the region.”

The main challenge however is to ensure that contemporary cultures are maintained within modernist strategies, whilst balancing the more traditional aspects of culture. Care must be taken to generate design from local concerns and conditions, as opposed to persistently appealing to the global masses. Keith Eggener explains:

Critical regionalist architecture necessarily, discriminatingly, identified, abstracted, and melded

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1) Kenneth Frampton, “Ten Points on an Architecture of Regionalism: A Provisional Polemic,” 387.


local, physical and cultural characteristics with more ubiquitous modern practices, technologies, and economic and material conditions. To be regional and modern involved an extremely delicate balance.\textsuperscript{17}

Further to this, it becomes apparent that conventional aspects of regionalism need to be applied concurrently to a contemporary narrative that disassociates from many aspects of globalisation. Globalisation undeniably provides progressive and dynamic opportunities through advances in technologies, communications and immigration however is not singularly capable of broad regionalist regeneration. Subsequently, global outcomes cannot be applied to local challenges. Examples include magnification of current local resources and intensification of existing ontological practices. Specifically, the practice of architecture must provoke technological and ecological practices above those of historical means.

Finally, to demonstrate regionalist ideas, it is important to identify local examples of critical regionalism in both commercial and residential builds. An early representation can be seen in Andrew Patterson’s Summer Street house in Auckland where there is a fundamental shift from “passive scenic aesthetics to dynamic ecological (and regional) aesthetics.”\textsuperscript{18} The house successfully rebukes the superficial, kitsch symbolism of indigenous architecture and moves towards the concept of the indigenous. Patterson went about rejecting the building’s bustling location by limiting apertures and thresholds. “The materials and aesthetic are part of an international \textit{vocabulary}, while the cultural \textit{syntax} is of the region.”\textsuperscript{19}

Critical regionalism has been used to mitigate such universal effects, particularly in terms of symbolic modernism where airports must now reflect culture and tradition in a contemporary sense.


\footnotesize{\textsuperscript{18} P Gobster, “An Ecological Aesthetic for Forest Landscape Management,” \textit{Landscape Journal} 18, no. 1 (1999) 54-64.}

\footnotesize{\textsuperscript{19} H. Ypma, \textit{Pacific Island} (London: Thames & Hudson, 1996), 144.}
Response to Frampton

Kenneth Frampton’s seminal work on critical regionalism, “Ten Points on an Architecture of Regionalism” was applied to the design process to provide an insight into the airport and its cultural position in today's global society, whilst attempting to connect the traveller to a New Zealand identity. Further, to bring excitement back to a journey that has become a dull and monotonous aspect of contemporary society. The ten points which Frampton discusses are:

1. Vernacular Form. The vernacular aids in establishing the individualities that persist in providing a sense of architectural belonging and it does so whilst ensuring origins are protected within the progression of the built environment. Vernacular architecture is based upon local needs, materials and practices grounded within current conditions.

Frampton argues that the vernacular is a paradigm of the cultural past dismissing the formalities of aesthetics. However, it is understood that there are vernacular solutions poignantly applicable today which go further to acknowledge the immediate and contemporary environment.

This demonstrates how critical regionalism is not wholly dismissive of globalisation “which then subsequently develops an aesthetic that is appropriate for the contemporary ideologies of a specific place.”

2. Modern Movement. Frampton acknowledges the role that modernism plays in critical regionalism. He advocates searching for inflections that can be applied thoughtfully to the contemporary needs of people and place so as to identify with global strategies on an individual scale. Modernism is often associated with homogeneity and mass production, where it becomes removed from cultural ideologies. Yet Frampton suggests that it currently holds value and can provide the “relevant cultural references for a new architecture.”

3. Myth and Reality of a Region. Frampton attempts to reconcile both formal and informal influences within a particular region including local experience and established functional ideals. Frampton describes individual regions as institutions, in terms of thought, and highlights two conceptual ideas – discourse and client. Discourse refers to local paradigms that become a conduit to regionalism and the client refers to the

22 Ibid., 16.

stakeholders who are accepting of it, when significance and progress is placed upon local culture.

Myth can be conceived as a conceptual school of thought as opposed to negative untruths and can thus become a “critical and creative force.”

This holds much relevance because of New Zealand’s immigration policy and immigrant contribution to society.

4. Information and Experience. When attempting to achieve sensitive and critical regionalist architecture, the information provided by media outlets should be treated with caution. Globalisation ensures that cultures are better informed today than ever before, which may not always be positive, applicable or timely. However, this continual procession may just “help to compensate for our rapacious, techno-scientific, commodification of the environment.”

Consequently, identities tend to experience an over indulgence of information at the expense of reality “rather than opening ourselves to

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24 Ibid., 381.
a direct experience of their corporeal form.” Frampton suggests that technology is the conduit for which critical regionalism must defy.

5. Space and Place. Frampton highlights the spatial arrangements of architecture and how these relate to their wider context. Architecture cannot be considered in isolation, it must be considered equally with culture, ideology, character and social structure. Frampton tries to reconcile the relations of life, interaction and community with formal spatial arrangements where “architecture cannot be limited by physical space, and identity of place cannot be contained by an independent building.” Subsequently boundaries, whether real or perceived, become important to critical regionalism and must ensure the interrelation of formalism, theory and culture. This is an important facet to consider within the airport typology once through the perceived and physical boundaries of departure, or prior to the boundaries upon arrival. As Heidegger similarly recognises, “being” can only take place in an established domain. Thus, each domain must be created, in order to be, and to experience. In an airport, placelessness occurs at such borders, and the challenge is to eradicate this so as to provide an immediate sense of belonging.

6. Typology and Topography. Typology, a classification of type, relates to culture and function. It reflects cultural progression and vernacular ideologies. Topography relates specifically to the site in question, the natural environment and becomes the physically defining characteristics of place.

These ideals involve new objectives and the integration of such with established ecology. Both typology and topography contribute to form and function, enhancing cultural ideologies and both are important factors necessary for creating architecture that interacts with indigenous culture, while responding adequately to the demands of the physical landscape. This relationship is dynamic and involves the intentional loss of the contemporary consequences of placelessness.

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Ibid., 383.


7. Architectonic and Scenographic. This is the process of the coming together of the overall technological form – the individual members, including cultural and environmental elements. This process should be honest and transparent in the way it relates and interacts with its ecology and immediate environment.

Scenographic refers to the capturing of atmosphere and mood through representations in nature. “The suppression of construction through the elimination of framework or the masking of the joints deprives architecture of its expressiveness, so that the architectonic significance of the work becomes obfuscated and mute.” Frampton thus advocates “a structural composition that carries deep human value and awareness of its surrounding natural environment.”

Architectonic must be appreciated in its structural form and seeks to understand the merits of architecture as an integrated experience, a whole greater than the sum of its parts – the “mythic reality of structural achievement.” The architecture should be appreciated as a structural achievement that integrates with the surrounding context to provide a deeper awareness of place.

8. Artificial and Natural. Architecture, the artificial, has a close relationship with natural and environmental form. Specifically, the artificial and technological interact dynamically and widely with ecological foundations. It must be sympathetic and interactive with the cyclical nature of climate. Thus, exploration was undertaken to determine which aspects of the artificial and the natural are vital in the creation of a critical regionalist terminal and how these facets are used to improve the formal and functional qualities of the building. Frampton further discusses the reliance on technological advances so as to explore and retain a suitable environment (be it artificial or natural), whilst retaining the effects of globalisation through technologies such as air conditioning which eliminates the diversity of the environment.

9. Visual and Tactile. This is an exploration of the senses where visual is equal to all others and where architecture can be experienced holistically by those who utilise it, creating depth within architecture. These senses

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go far in how we experience the hierarchy of spatial arrangement. As Frampton suggests, a critique of the visual should be able to be undertaken in a tactile manner, and where touch is experienced visually, “the implication here is that the being as a whole has a greater capacity to resist than the ‘short circuit’, so to speak, connecting visual stimuli to information rather than experience.”

Critical regionalism acknowledges and embraces the multi-sensory concept; it promotes the use of materials that have certain local affinities, structures that provide certain bodily responses, and the regional seasonal changes that permit diverse emotional reactions. Assorted sensory experiences presented in the context of modern buildings may create new, unique and local experiences of place.

Frampton’s theory creates the opportunity for reflecting culture in an adequate, contemporary way, being seen and respected at an international level, without the loss of identity and cultural heritage.

Further, “it is symptomatic of the priority given to sight that we find it necessary to remind ourselves that the tactile is an important

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dimension in the perception of built form.\textsuperscript{32}

\textbf{10. Post-Modernism and Regionalism.} Critical regionalism is the subsequent acceptable stance between post-modernism and traditional. It reflects and understands both stances and offers “a critical basis from which to evolve a contemporary architecture of resistance – that is, a culture of dissent free from fashionable stylistic conventions, an architecture of place rather than space and\textsuperscript{33} a way of building which is sensitive to culture and climate.

Above all else, critical regionalism is a “concept of the environment where the body as a whole is seen as being essential to the manner in which it is experienced.”\textsuperscript{34}

\textbf{2.4 NEW ZEALAND IDENTITY}

In order to understand critical regionalism as it relates to a New Zealand identity, we must explore the term \textit{identity} and seek to understand what it is to be a New Zealander.

Alcoff and Mendieta\textsuperscript{35} recommend that identities need to be analysed in both their cultural location and in relation to historical epoch which requires the consideration of events that have contributed to the development of the national identity. It must also be noted that identity is not a static concept, but a dynamic process of reinvention.

For the purposes of this project identity refers to cultural and national distinctions. National identity is concerned with the sense of nation as cohesive, a commonly suggested interrelationship which is more mythical than literal. Specifically it relates to the structure of a civilisation and is the “sentiment of belonging to a community whose members identify with a set of symbols, beliefs and way of life.”\textsuperscript{36}

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\item[34] Ibid.
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Cultural identity is a community’s connection to who we are and is not bound by ethnicity or country as such. Cultural identity is the combination of experience, behavioural patterns, concepts, values, assumptions and also, languages. It is an important factor in a person’s sense of self and distinct connection to others.

With the Treaty of Waitangi signed in 1840, New Zealand became a colony and this formed the catalyst that brought two cultures together. The First Governor of New Zealand, William Hobson, deduced “we are all one people.” Further;

For what makes a New Zealander today can owe in part, some of its origin to the colonisation of both Maori and Pakeha. They were motivated and organised by the myths that surrounded settlement, by crescendos and obligations that were both cultural and economic.37

It can be suggested that the current New Zealand national identity originates from this, an historically fractured culture. Maori tribes typically asserted their identity in relation to land whilst attempting to retain specific rights. It can be said however, that New Zealand neither forgets its colonial past, nor imposes a singular narrative. Shared narratives are empowering and lead to a satisfying social cohesiveness.

Although the early years of New Zealand’s national identity were fraught, “an identity was borne out of British influence through literature, arts, sport”38 and ensured New Zealanders were stoic, loyal and dogged, with a highly regarded social disposition. New Zealanders were considered friendly, fair and approachable.

It is evident through New Zealand’s social policies, such as immigration and welfare, that there has been a cultural evolution in which an anxiety developed amongst Maori, European, Pacific Islanders and Asians. This was also due to age of existence – New Zealand as the ‘teenager,’ which ensured the country was more closely linked to its historical connections than it is today; originally all people came from the same place. As New Zealand grew through immigration it began to show signs of diversity.


38 Ibid., 63.
Unfortunately the consequence was an increasing lack of commonality amongst New Zealanders.

Social discrimination was evident as New Zealanders developed a vulnerability and misinterpretation of other cultures. Locals ensured immigrants adapt their ways to New Zealand culture, as the country remained steadfast and bicultural. “New Zealanders are anxious about change, particularly when it comes to immigration and we are very unwavering and rigid if exposed to change by foreigners.”

It is expected that the adopted cultures must adapt swiftly to New Zealand’s way of life, particularly when regarding the ethos of the land. They are also expected to interact with the established demographic and integrate socially through the outward expression of loyalty. New Zealanders’ insecurities ensure adjustment to others is rarely undertaken. The newly initiated must, however, assert themselves physically by negotiating the demands of the landscape and its tools, becoming pragmatic and ‘hands on.’

New Zealanders also have an extreme dissatisfaction with loss, showcased seasonally through the love of sport. There is further emotional loss such as the loss of icons, including Sir Edmund Hillary and Sir Peter Blake. This is a time when the New Zealand public outwardly expresses much grief in a communal forum. With Hillary and Blake, the loss was one of modesty strength and stamina.

The first to arrive at a new day, New Zealand senses the distance from itself to others, both geographically and culturally. New Zealand is after all, on the edge of the world, down under, suspended from the ankles, antipodean. This persistence of remoteness evokes a nationalistic emotional attachment where one can “identify with its symbols, and partake in the practices and rituals that demonstrate commitment to the nation.”

Expressing identity through symbolism is vital and provides commonality distinct from others. However, symbolism can be at the exclusion and detriment of others where “Kiwiana works to alienate.” This physical

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practise ranges from official symbolism as seen on flags, bank notes and coins, to that of ‘Kiwiana’ which refers to common icons of social expression including jandals, BBQs, the Four Square and sheep. “The national identity of New Zealanders as pioneering farmers was expressed in the use of sheep as a symbol of New Zealand.” Even as far back as the 1940s, New Zealand was adopting national symbolism. This was seen to provide strength and cohesion for the nation.

Patriotism would also come to the fore when overall values were deemed to be at risk and insecurities exposed. Under such conditions, “New Zealanders most strongly uphold local norms and identify with national icons” including the Kiwi, silver fern and Southern Cross.

There is a level of importance placed on both physical and non-physical attributes in New Zealand. However, the one of landscape reigns supreme. It is a setting of envy and is predominantly well received.

New Zealanders are all too aware of this, citing the clean and green as part of their national identity. It is suggested that New Zealand’s strongest representation of national identity is that of our relationship to the environment where “identity is based around our close connection and affinity to the land” and to the sea. “New Zealanders have a huge bond with the land, regarding it and their attachment to it as a defining character of ‘New Zealandness’.”

Also notable is the Overseas Experience (OE) where young New Zealand adults leave their home comforts and head abroad for work, – an important rite of passage. This process has much significance to the local culture and showcases New Zealand’s interaction with the rest of the world.

New Zealand recognises the need to be globally competitive and economically driven and this helps paved the way for New

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46 Chesters and Irvine, Culture Wise New Zealand, 72.
Zealanders to explore the world. Those who remain “demonstrated a complacency of identity.”

The government attempted to refocus New Zealanders’ attention to its varied culture so as to achieve “an open and inclusive society, celebrating both its diversity and partnership with Maori in a bicultural nation.”

This attempt was to encourage a shared language in the era of globalisation and to reassure Maori who may have felt the initial effects of multiculturalism negating their indigenous status. The government further defined the national identity as democratic and resourceful, people who were steadfast in their beliefs and who demonstrated much determination with a character more “eager, inventive and resourceful.”

The nation is today, self-reliant, dogged, eager “more intolerant of criticism than any other man in the world.”

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46 Ibid.


49 Ibid., 86.
New Zealander’s are commonly asked what it is that makes them unique. Ingenuity, tolerance and pragmatism are terms that are often expressed, but much of the time the affiliation with the land is the most prominent, in which they want to experience and celebrate, but not disrupt. “New Zealanders’ sense of self definition is heavily bound up with the love of the natural world.”

New Zealanders have a physical connection to their environment. Furthermore, New Zealanders value their independence and place a high value on freedom. A loss of collective rights and freedom would be difficult for New Zealanders to accept. Jane Clifton suggests that New Zealand is very much the “teenager of the world. We want to do our own thing, and we’re doing it - but we still really want that pat on the back from overseas.” And research suggests that due to our lack of civil conflict, there is a far superior sense of freedom, compared to other countries.

New Zealanders are humble but determined, self-conscious and ambivalent when it comes to our own successes. Success is more acceptable to New Zealanders if it is achieved collectively. When this is not the case, Tall Poppy Syndrome is expressed. New Zealanders expect one to give back to their roots and this is keenly embedded in the New Zealand psyche. New Zealanders are also skilled at working in teams with a strength that is thought to have derived from the rugged landscape. Too much success ensures those that are getting ‘too big for their boots’ get cut back down to size. “New Zealand has a strong liberal, puritan tradition that aspired to fairness, where the greater good prevails over individual ambition.”

There is also a self-perception which is innovative, entrepreneurial and loyal. Challenging perceptions, valuing equality and the individual work ethic is important. This is only contrasted by the laid-back with a reluctance to undertake confrontation other than with a “laconic sense of humour so often used to defuse conflict.”

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53 Chesters and Irvine, Culture Wise New Zealand, 20.
54 Sibley, Hoverd, and Lui, “Pluralistic and Monocultural Facets of New Zealand National Character and Identity,” 22.
Recently, the World Economic Forum ranked New Zealand the second most friendly and welcoming country in the world to foreigners. New Zealanders are egalitarians and recognised for their generosity. To recognise and demonstrate these collective attributes is critical in the development of a regionalist airport terminal in Auckland.

2.5 AUCKLAND AIRPORT

The Importance of the Airport
Today the international airport is the epitome of globalisation with a direct link to the global progression of capitalist expansion. The airport represents prosperity, transnationalism, trade, technology and immigration, – all of which can be associated with globalisation.

Auckland Airport is New Zealand’s largest international and domestic airport and Australasia’s second busiest airport, after Sydney’s Kingsford-Smith.\textsuperscript{55}

Currently Auckland Airport hosts over 14 million passengers per year, eight million of which originate from international flights. This ensures that the airport is an integral part of New Zealand’s economy, of which tourism is the second biggest industry, behind primary industries, and is worth an estimated NZD9.8 billion in export earnings.\textsuperscript{56} Consequently, Auckland Airport plays a significant part in the economic growth of New Zealand, contributing 9% to the annual GDP, and NZD3.5 billion to Auckland’s regional economy through annual visitors, of which

\textsuperscript{55} Auckland International Airport Limited, “Growth Strategy.”

\textsuperscript{56} Auckland International Airport Limited, “Masterplan.”
2.7 million arrived in 2013. Auckland Airport’s total revenue for the financial year ending June 2014 was NZD475.8 million, up 6.1% from the previous year.\footnote{Auckland International Airport Limited, “Annual Report 2014.”}

The airport provides a huge international freight operation, ~ 230,000 tonnes, worth NZD13 billion\footnote{Ibid.} to the New Zealand economy. At present, 92% of New Zealand’s air freight imports and exports are facilitated through Auckland Airport.\footnote{Ibid.}

Currently, Auckland International Airport Limited (AIAL) directly employs approximately 300 staff. 12,000 people are employed within the greater airport precinct, most of which derive from within 30 minutes’ drive time of the airport’s location. With over 443 hectares of land yet to be commercially developed, this could potentially double by 2044.

It is estimated that around 40 million passengers will utilise the airport annually by 2044, 24 million of those will be derived from international flights and 16 million from domestic.\footnote{Auckland International Airport Limited, “Masterplan.”}
It is important to recognise that 72% of all visitors to New Zealand come through Auckland Airport, making it the main gateway to New Zealand. This necessitates the airport be reflective of the country holistically, not simply Auckland centric. Although it has become a symbol of globalism, it must reveal the local inflections and peculiarities of place.

The tourism industry in New Zealand is set to grow by as much as 6% come 2025. Among many factors, aeroplanes are increasing their load capacities. AIAL must, therefore, ensure that its operations cater for the new, much larger aircraft, such as A380 and B787, to ensure this 6% in growth becomes viable. This will also provide the opportunity to open up new direct routes which will have the potential to directly influence relevant industries.

The emerging global economies are Asia-centric and New Zealand already hosts high visitor numbers from China, one of our closest trade partners, and India. Subsequently 66% of their populations will undertake international travel each year by 2034. The current figure of around 200,000 Chinese visitors is set to double by 2020.

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Ibid.

Auckland International Airport Limited, "Growth Strategy."
The airport is located near a growing South Auckland community. Therefore, AIAL must work to establish the value of the airport, not just in terms of economy (jobs, trade and technology) but in terms of community engagement. It is also important to help to establish a cultural position in today’s global community, whilst attempting to connect the traveller with the place that they are departing or arriving to. And further, to bring excitement back to a journey where travellers share a sense of belonging and an experience of place.

History

Auckland Airport began life in 1928 as the Auckland Aero Club which owned three De Havill and Gypsy Moths. The site was eventually built upon to accommodate the three aeroplanes.

There is just a single runway within the airport precinct and much of this was crafted originally on reclaimed land from Manukau Harbour in the 1950s. The reclamation further involved using scoria from the cones of volcanic Puketutu Island. 63

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It was not until 1960 that work started on Auckland International Airport which was to become the primary airport for the region, succeeding Whenuapai Airport to the north west.

The first commercial flight to depart Auckland International Airport was on 28 November 1965. The Air New Zealand DC-8 was headed to Sydney. It was not until 12 months later that the airport was officially opened over Auckland Anniversary weekend, 29-31 January 1966.

All flights during this time operated from what is now the domestic terminal. However, in 1977 a new international terminal named after Jean Batten was constructed.  

Auckland International Airport Limited (Auckland Airport) was formed in 1988, when the New Zealand government privatised Auckland Airport. In 1998, the government sold much of its shareholding and Auckland Airport became the fifth airport company in the world to be publicly listed.  

In 2002 the International Civil Aviation Organization (ICAO) declared that all arriving international passengers were to be separated from departing passengers due to terrorist activity at the time. With increased security, Auckland Airport gained an exemption from this until 2006. However, in 2005 part of the international terminal was altered, separating the departing from the arriving passengers.

In 2003 the marae, Te Manukanuka o Hoturoa, was built to the north east of the international terminal in a partnership between Auckland Airport, Te Arikinui Dame Te Atairangikaahu and the local tangata whenua.  

North west of the current runway is the site of Auckland Airport’s second runway. Construction on this began in 2007 and was initially to be 1200m in length to cater for smaller domestic aircraft. However, in 2009 construction ceased due to the global recession. Construction on this runway is expected to recommence within the short term to be completed to a length of 2150m by 2025. This runway will cater for all domestic

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65 Ibid.
flights and also international flights from Australia and the Pacific, which in the foreseeable future will be classed as domestic.\textsuperscript{67}

In 2009 construction began on an extension to the international terminal and created what is today known as Pier B. Covering 5500m\textsuperscript{2} it is capable of handling two aircraft at any given time, specifically A380s.

In 2013 work was undertaken to upgrade the domestic terminal including roading, baggage facilities and apron extensions.

In 2014 Auckland Airport released its growth strategy which involved a 30 year master plan ensuring the international and domestic terminals combine under a single roof, based around the existing international terminal. In stage one, new piers will be constructed for international flights. The infrastructure including roadding, and rail links will be provided by stage three.\textsuperscript{68} By 2044 in phase four, the northern runway will be extended to 3000m.

\textsuperscript{67} Auckland International Airport Limited, “Growth Strategy.”
\textsuperscript{68} Ibid.
Current Operation

AIAL is the organisation governing Auckland Airport and its commercial and aeronautical operations, which includes both the international and domestic terminals.

Auckland Airport moves over 14 million passengers per year\(^69\), 8 million of which are international travellers\(^70\) and 863,000 of those are transit passengers. This equates to over 120 international and over 300 domestic flights per day – 155,000 flight movements per annum. Auckland Airport accommodates flights to 22 domestic and 34 international destinations and plays host to significant cargo operations, 230 tonnes of freight per annum, worth NZD13 billion.

Currently, 72% of all international visitors into New Zealand come through Auckland Airport, along with 92% of all long haul visitors to New Zealand.

The airport has 300 staff directly employed and operates 24/7 with no imposed curfew, however, noise restrictions apply.

AIAL has ownership of over 1550 hectares of land within its precinct. This land includes 443 hectares earmarked for future commercial property development.\(^71\) The precinct also has 900 businesses and two hotels on site, including the 260 room, four-star Novotel and fully equipped land and sea based emergency response teams.\(^72\)

The current international terminal is 118,643m\(^2\) in size over two levels and the domestic terminal is 21,535 m\(^2\), also over two levels. There is currently one runway which is 3635m in length, 75m wide which includes a 45m structural width and two 15m shoulders. The runway, taxiway and apron areas are made from bitumen and concrete with a Pavement Classification Number (PCN) of 65.

Currently the domestic terminal has eight airbridge stands and four remote stands. The international terminal has 14 airbridge stands, including two that are A380 compatible, and 10 remote stands. In total there are 56 aircraft positions within the airport precinct including emergency and cargo areas.

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\(^{69}\) Auckland International Airport Limited, “Masterplan.”

\(^{70}\) Auckland International Airport Limited, “Annual Report 2014.”

\(^{71}\) Auckland International Airport Limited, “Facts and Figures.”

\(^{72}\) Ibid.
The airport currently accommodates a number of airline lounges for Air New Zealand, Emirates and Jetstar. It also has its own Airport Premium Lounge and there is currently over 16,000m² of retail within both terminals.

Airport revenue is made up of three commercial activities. The first is Aeronautical Revenue which accounts for 46% of revenue; NZD160 million in 2013. Aeronautical operations consist of airfield income, passenger service charges and terminal service charges. Overall revenue is further made up from the Retail Division and includes duty free, foreign exchange, food and beverage, retail and car parking, where airside passenger spend rate is four times that of landside. This sits at around 38% of total revenues and in 2013 was NZD133 million. Finally, Investment Property Revenue plays a significant part in the overall revenue which was NZD21 million in 2013.

Each day 63,000 vehicles enter the AIAL precinct. Parking caters for a small percentage of those within the airport grounds. Currently there are 6,500 public spaces and 2,500 staff spaces primarily in single level car parks. There is one multi storey car park predominantly catering for the domestic terminal but also provides a valet service at both international and domestic terminals.

Public transport to the airport is limited. Although there are a number of airport shuttles, buses and taxis available, there is no rail or sea link. Auckland hosts the Airbus Express which runs 24 hours a day. This connects the CBD to the airport via Auckland’s suburbs. The Downtown Ferry Terminal is opposite the Britomart Transport Centre, which allows bus and train connections to the wider Auckland area. Buses operate on a regular basis. The 380 Airporter operates between the airport and Manukau City via Papatoetoe Railway Station. At Papatoetoe, passengers can connect to rail services heading to Britomart Transport Centre via the Southern & Eastern lines and buses operate half hourly all week.

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73 Auckland International Airport Limited, “Growth Strategy.”
74 Ibid.
75 Ibid.
77 Ibid.
To 2044
This project provides facilities to accommodate travellers in 2044—40 million passengers per annum.

The architects and engineers of airport terminal buildings must always contend with the contrasting requirements to accommodate large volumes of people through the building each day, yet alleviate the long walking distance between arrival and departure points within the terminal. “piecemeal development over time always erodes this ideal, leading to confusing airports with a welter of walkways and remote waiting areas.”

There is a huge requirement for technologies which look to streamline the entire airport experience from check-in to departure. Yet many of these processes and procedures will detract from the friendly, personalised experience requested so often of such institutions. As New Zealanders are known for their welcoming, friendly manner, it is important to enhance this perception through design.

With the steadily increasing amount of people using Auckland Airport, facilities must be expanded to ensure ease of way-finding and directness of route. However, with the technologies predicted the actual physical space required for a lesser dwell time and large bulky hardware will be far reduced, despite the current trend for far larger airports. It can be suggested therefore, that airports are also trending towards becoming places to gather for an entire community, where many airports have become destinations in their own right harbouring community facilities. With more efficient check in services, more dwell time will be created at airports encouraging retail activity and commercial expansion, both landside and airside.

Over the next ten years all passengers will have automated check in facilities enabled on their smart phones which must be (and by 2044 will be) Near Field Communication (NFC) equipped. This technology will be harnessed on a massive scale due to its versatility and applicability to a multitude of airport operations.

Qantas has produced ‘Q Tags’. “These enable the passenger to check in by swiping their card at a reader, drop bags off at a dedicated bag-drop

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78 The recently released AIAL Master Plan has set a target which will accommodate a projected 40 million passengers in 2044. It is a 30 year strategy which forms the basis of this project.
counter and board flights by scanning the cards. Post 2015, NFC communication will be widely spread and adopted by most airlines and where “247 million smart phones will be NFC enabled.”

The IATA has recently sanctioned new check in and security facilities which are designed to streamline the security procedures compulsory in all airports today. Former IATA Director General, Giovanni Bisignani, states “Passengers should be able to get from the curb to the boarding gate with dignity. That means without stopping, stripping or unpacking.”

These new screening techniques will eradicate such a homogenised process and instead it will work with “a more idiosyncratic approach combining intelligence with technology.” Subsequently, the screening process will be initiated prior to the passenger reaching the airport. Behaviour analysis and risk assessment data will be pre-screened by the government. Upon reaching the airport the passenger is biometrically identified and based on secure data analysis, will then be assigned to one of three types: ‘known traveller,’ ‘normal traveller’ or ‘enhanced traveller.’ This is where threat levels are determined for each passenger. This revolutionises the process by alternatively looking for ‘bad people’ as opposed to ‘bad objects’.

Historically check in was controlled by a multi-step process where computer reservation systems (CRS) and departure control systems (DCS) were utilised. In more recent times these systems have been replaced by self-service kiosk and online check-in. This still however involves multiple steps, but does help eradicate stressful queues at check in. It is difficult to predict if, by 2044, these technologies will still be appropriate.

Technological advances pave the way for a paperless check-in. It is unlikely that kiosks will be required in the future, where the most physical presence of a ‘check-in’ would be a bag drop area which airports, such as Mexico City (Foster and Partners) are pioneering.

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81 Ibid.
83 Ibid.
85 Ibid.
In 2044 there will be a target of 10–20% improvement on current runway capacity, due to the streamlining of existing operations and the alleviation of apron congestion through the optimisation of ground services efficiency and space utilisation. This will ensure Auckland Airport accommodates more than 47 aircraft movements per hour and will place an increase on the demand for baggage and security services, along with decreased dwell times and optimised processing. Apron areas will be configured in a more convenient and efficient format to allow for quicker turnaround of larger aircraft in order to accommodate the growing trend of much larger aircraft and an ever increasing number of flights.

Further to this, AIAL will rely on increased revenues to ensure it remains commercially viable. The bulk of the airport revenues come from commercial activity. Research suggests that the bulk of retail, food and beverages are transacted airside. Due to increased dwell time airside (owing to more intuitive way-finding, streamlined technologies for check in, immigration and security efficiency) and less time landside, over 70% of this activity will now be situated airside. Currently 38% of AIAL revenue comes from retail activity. This is due to increase by 16% in 2044.  

The commercial land investment activities of AIAL make up 6% of overall revenue. AIAL acquired much land very early in its existence whilst planning for future growth and by doing so AIAL has acquired all of the land required for operations for the foreseeable future. The commercial activity is there to boost community involvement and engagement and will be expanded beyond 2044. The land will be leveraged and managed by way of maximisation of amenities and facilities encouraging economic and community growth within the AIAL precinct. The flat site is an ideal place for industry and business and as a priority, community activity.

The airport will have a brand new infrastructure network including a rail link, new bus and taxi lanes, cycle paths, multi-level underground car parking facilities and drop off zones. By 2044 a

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rail-link will be a welcome form of transport to Auckland Airport from Britomart and beyond. There will be a double layer, multi-lane ring road to both international and domestic arrival and departure levels. These improvements to infrastructure will ensure a decreased travel time to and from the airport.

Britomart, along with a number of central city hotels, will act as a check-in facility to alleviate pressure on facilities at the airport terminal, where the check-in facilities as we know them will likely be replaced with biometric, RFID and NFC pre-screening technologies.

The development of the northern runway at Auckland Airport is vital in consolidating its role as the preferred gateway to New Zealand. With vastly growing passenger numbers and increasingly large aircraft it will enable better use of the existing runway, and ensure the capacity to meet demands beyond 2044.87

The new runway will be “north of, and parallel to the existing main runway. It is being developed in stages, determined by a number of

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factors, including the demand for capacity on the existing southern runway and apron areas.”

The initial stage of construction is concerned with the creation of 1200m of runway dedicated to smaller aircraft. “The smaller aircraft typically service flights to New Zealand’s provincial cities, regional towns and communities.” There will also be greater distance than previously suggested between the two runways and terminal, piers and airbridges to allow for the increase in larger aircraft. By 2044 it is understood that aeroplanes such as Boeing 747s will become obsolete and there will be a non-correlated increase in flights and passengers (as aeroplanes move more passengers per flight). Airports will also consist of two levels. This will accommodate the larger aircraft predicted to be in service by this time and ensure the separation of arriving and departing passengers.

Studies suggest that by 2044 Auckland will become one of the major airport hubs within the Asia Pacific region, where Auckland Airport will see a major increase in transit passengers and an uncorrelated increase in domestic traffic. This will be in part, due to the consideration of Australian and Pacific flights as domestic in terms of security, baggage and processing.

Efficiency also means reducing the uncertainty often experienced by travellers. This anxiety and stress is most often related to security processing and baggage claim. In 2009 more than 25 million bags were mishandled according to the Transport World Passenger Survey.

Through the adoption of the latest communication technology, processes and internal systems that take advantage of advanced technology and shared information, airlines and airports can improve their service delivery. This is a new age, currently of passenger self-service which is being driven at present by the adoption of smartphones and tablets.

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88 Ibid.
89 Ibid.
90 Auckland International Airport Limited, “Growth Strategy.”
91 Ibid.
92 Ibid.
The major influence on the advancement of airport operations is technology represented by integrated systems. All facets of an airport now progressively share information including between passengers, airlines and baggage. Baggage alone will communicate directly with the passenger via location specific software, ensuring that it is not lost or delayed, improving overall efficiencies.

Airports are keenly investing in the infrastructure for next generation technology as they endeavour to find a balance between operational efficiency, the care of their passengers and the wider community, reflecting an experience of place.

Some of the most up to date technology today may be obsolete by 2044. However, in the interim, through the automation of specific activities such as issuing boarding passes, bag tags and flight delays, the dwell time of passenger spent in queues and in a state of anxiety and frustration will be reduced, improving the overall passenger experience. The main objective at present is to ensure the infrastructure is in place so as to have an holistically, unified communications system. And as such technologies advance, the interaction of the passenger and terminal will ensure an automated check in response to ease the frustration of the passenger to the airline.
Future Proofing 2044+
By 2044 it is predicted that 40 million passengers a year will travel both domestically and internationally, through the airport. Beyond, this number is set to increase at a rate of 3% per annum.

The proposed rail link from Britomart to Mangere will involve two tracks with the expectation that the line will eventually continue south from Mangere. The infrastructure to ensure this becomes a reality will be in place by 2044.

There is a large push to ensure that public transport becomes the preferred mode of transportation in Auckland by this time. However, research does suggest that Aucklanders’ relationship with cars is strong and will remain steady beyond 2044. The infrastructure will be in place to ensure car parking can be expanded past 2044. There will also be advancement in cycle and bus lanes.

The northern runway will have been extended to capacity prior to 2044. Auckland Council will have to consider runway alternatives, primarily at different locations including Whenuapai, Ardmore and the North Shore Aero Club.

After 2044 a new control tower will be constructed to make way for the increase in air traffic movements which by this stage will involve over 260,000 flights per annum.

No extensions will be required to the terminal until at least 2054 at a 3% per annum growth rate. Exploration suggests that a footprint between 400,000–500,000m² will accommodate up to 60 million passenger movements per annum.

Fig.2.5.7 Correlation of International Airports’ Floor Areas and Passengers
However, from this saturation point onwards the following stages of construction will be required where stage one involves an extension to the existing international terminal. Stage two will then involve expansion to include the domestic terminal and stage three will be a new satellite terminal with underground connections, utilising the pre-existing underground rail terminus.

Fig. 2.5.8 Proposed Auckland Airport Expansion, 2044+
2.6 PRECEDENTS

**Incheon International Airport (ICN)**

ICN is 45 km west of Seoul. It moves 41 million passengers per year and is 550,000m² in area. It provides for 76 gates and was designed by Fentress Bradburn Architects. Incheon is one of the central transport hubs of Asia.

Opened in March 2001, it was built on reclaimed land between Yeongjong and Youngyu Islands, which is filled with historical reminders from the Korean War. It houses the Korean Culture Museum, Traditional Culture Experience Zone, Traditional Craft Gallery and Arrival Hall Culture Street, providing domestic and international passengers with opportunities to experience Korean arts and culture. The Arrival Hall’s Culture Street is located across four different areas along the arrivals concourse. Visitors can observe Korea’s natural beauty, the ethos of the people and artefacts from its 5,000 year history where extreme levels of craftsmanship are showcased.

The architecture reflects Korea’s regionalism through the bow of the roofline emulating a traditional temple, whereas the biomorphic train
terminal reflects the cultural technologies of the future. The terminal is described as drawing a “harmony between Korean images and global design trends and technologies.”

On the departure side of the airport, curved canopies oversee the roadside departures which offer shelter from the elements. Horizontal curves and vertical, straight structural members recall early Korean palaces and the dominance of the marine trade. Local materials including steel, granite used on the security areas and wood panelling to soothe in customs areas are showcased.

“Cultural warmth and symbolism” are seen throughout the airport and are reminiscent of modern Korea. Glass elevators connect all five levels of the airport and expose airport operations by way of iconic pieces which help guide the pedestrian traffic. Art, banners and landscapes also help to identify destinations.

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Chhatrapati Shivaji International Airport (BOM)

BOM’s new terminal has an area of 410,000m² to process 40 million passengers per annum over 32 gates.

Much of the interior was designed by local artists and designers calling upon tradition and local materials such as custom stone inlays and mirror work installations.

The dry hot climate ensures that traditional patterns filter light through perforated metal screens with green roofs diminishing heat loads. The architecture is rooted purely in the Indian context, growth and change now being rooted within Indian culture. This city is the country’s financial capital, resulting in an increase in hub traffic. It is also expanding to accommodate India’s financially secure middle class which has resulted in an increase in global traffic. The new terminal is a myriad of ideas that “feels intuitive and responds to the region’s rocketing growth.”

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93 Fentress, Bradburn Architects, 10 Airports (New York: Edizioni Press, 2006), 50.
94 Ibid.
contours are reminiscent of India’s old pavilions which ensure local culture interacts directly with advanced globalised design.

Fig. 2.6.2 Chhatrapati Shivaji International Airport (BOM), Mumbai, India – SOM 2014
Denver International Airport (DEN)
The overall building form of DEN is highly reminiscent of its unique backdrop. The materials used make for a close comparison. The overall context of this airport is dry and barren with the Rocky Mountains behind providing all of the inspiration. The remarkable forms and local materials are in the spirit of critical regionalism by mirroring the context with technological advancements. This renders the building a symbol of its environment which provides the locals and visitors alike, with a sense of place and belonging.

The design of the terminal is unmistakeable, creating unique colours and shadows which become more profuse as the sun moves. Fabric was chosen for the main material as it was thought to best emulate the objective of the design and offered inspired similarities to its backdrop.

The terminal colour ensures that it blends in with the barren outlook and speaks “to the confluence of mountains and plains, the intersection of land and air, and the magic of flight.” Further to this, the culture of innovation and technology celebrates progress and achievement, whilst allowing for a timeless quality.

The floors of the terminal are crafted out of granite and have detailed patterns that resemble the qualities of the roof. The terminal also provides a number of specific points where the terminal connects best to the Rocky Mountains.

A vital component of critical regionalism is acknowledging the varying climates in specific areas. There is a level of engagement to be undertaken, which DEN achieves through allowing “stratified hot air to escape by radiating through the fabric and due to its translucency minimises the need for artificial lighting.” The airport has also been designed with a number of clerestory windows to further enable the relationship with the natural environment.

Part of the airport has been subsumed as an art gallery with an ever changing array of works to help engage community. There are also a number of more permanent works which include paper aeroplanes

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95 Fentress, Bradburn Architects, 10 Airports, 13.

97 Ibid., 19.
suspended from the roof in the arrivals hall. These works are said to “enhance the overall aesthetics, they also enhance the airport’s functionality, acoustics and maintainability.”

The airport has capacity for 50 million passengers annually, utilising 94 gates. This airport has become a global gateway with regional attributes and functional solutions.

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Ibid., 20.
Barajas International Airport (MAD)

MAD is located near Barajas, on the outskirts of Madrid, Spain, and was designed by Rogers & Lamela in 2004. The current total floor area of this airport is over 760,000m² and is located within greater Madrid, 9km from the central business district and 13km away from Madrid’s infamous historical hub. This airport infrastructure is key and includes rail links to aide in moving 70 million passengers per year.

Due to the size of the airport, it is critical for travellers at the airport to experience ease of way-finding. This is achieved effectively by utilising varying ceiling heights to indicate specific areas within the building. For example, the roof extends lower around the retail areas and security barriers. Contrastingly, where there is more freedom of movement, the roof soars upwards providing a sense of light and space. Further, there is a strong local climate and thus the airport was designed to respond effectively to the changing seasons. To provide ample light into the terminal, the roof forms, which are reminiscent of huge waves, are constructed of louvres to effectively move as the day and climate progress. There are a series of canyons cut through these flowing waves which also allow light to transmit to the lower levels.

Structurally the airport roof is contained by large beams protruding from the floor. These are ‘v’ in shape and provide regiment and order to an otherwise freeform structure. The split level terminal does well to separate secure areas, yet allow a sense of freedom where aircraft can also be seen. The forms are also punctured with lighting which provides direction and gives the impression of “passing through high level bridges, over much lower landscapes.”

Fig. 2.6.4 Barajas Airport Terminal 4 (MAD), Madrid, Spain – Rogers & Lamela 2004
Fig. 2.6.5 Matt Moriarty, Helvatiki
3.0 PROJECT DEVELOPMENT

3.1 SITE

The proposed site for this project is that of Auckland Airport located in Mangere, 20 kilometres south of Auckland’s central business district.

Fig. 3.1.1 Location Map
The site currently caters for over 14 million passengers per annum, eight million of which are international. Per month this equates to the movement of around 700,000 passengers within the international terminal. The airport turns around 4,000 aircraft a month.

The site sits within the protection of Manukau Harbour and is exposed to all day sun and Auckland Council noise restrictions. The temperate maritime climate is reaches high temperatures and humidity in the summer months and with low temperatures and much rain during winter.

Auckland is the largest urban region within New Zealand. The average maximum temperature is 24°C and is usually experienced in February, whilst the average lowest temperature is in July at around 7°C.1

The airport terminal is subject to offshore winds and bounded by Manukau Harbour to the south and west, and by its waterways to the east. North of the airport lies a heavy commercial area, zoned for further development. The site is also subject to Auckland’s prevailing south westerly winds.

Currently there is car accessibility and bus links to the airport. These vehicles predominantly access the precinct by way of the Southern Motorway and George Bolt Memorial Drive which is the main arterial route into the site. There are currently no rail or sea links into the area. However, rail does link to the Mangere township and an extension to the airport has been discussed, but as yet there are no imminent plans to extend.

The journey to Auckland Airport is all important by both road and air. By air the approach is predominantly from the west where remote surf beaches and rugged landscape can be found. By road the approach is vital in that there is one major arterial route approaching from the north which adjoins the eastern and southern motorways.

The site is made up of concrete, asphalt and grassed areas. Specifically, the runway and ancillary services consist of bitumen and concrete (PCN 120/R/D/W/T). Much of the runway was constructed on reclaimed land using scoria.

There is little to no vegetation on site. Some mangroves do appear however to the south eastern boundary, the rest is predominantly

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farmland, with some smaller attractions such as Butterfly Creek and a golf driving range.

The site is operational 24 hours a day, 365 days per year. The majority of air traffic falls between the hours of 6:00am-11:59pm.

Owned by AIAL, the entire site is made up of 1500 hectares with 443 of those available for commercial property development. Auckland Airport is key to generating economic activity within the region.

The airport district currently has 303,000m² of developed business including two hotels, over 16,000m² of retail and food and beverage outlets, office space, warehousing, recreational facilities and more than NZD520 million worth of total assets. Auckland Airport is committed to a strategy of long-term investment in commercial property and strives to generate increased economic activity. There are currently amenities for 12,000 workers within the site, 300 of which are Auckland Airport staff.

The site consists of two terminals, international and domestic. The international terminal alone has 14 airbridge stands and 10 remote stands for aircraft, covered and uncovered car parking for over 6,500 vehicles in both long and short term designations. The entire site plays host to over 65,000 vehicles a day.

Currently the site has a single runway which is 3635m long and 75m wide which includes a 45m structural width and two 15m shoulders. Due to global positioning and climate guidelines, the runway stretches from a north east position to south west. Located next to the runway are the emergency services which consist of fully equipped land and sea fire fighting vehicles and trained emergency personnel. Next to this is the aviation engineering facility that caters to both international and domestic traffic. The control tower currently resides between the international and domestic terminals.

Running parallel to, but north-west of the current runway, is another runway site to be constructed within the next ten years, to cater for increased aircraft and passenger numbers. At this time a new and fully integrated terminal is also planned to cater for both international and domestic traffic.

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102 72% of all visitors to New Zealand use Auckland Airport as a gateway.
As expected the site is predominantly flat, with minimal undulation.

There are ample vantage points within the site for viewing the airport’s operations and these make up the greater commercial site. Over the estuary to the east lie two large car parks utilised for plane spotting.

3.2 PROGRAMME

Factors that will determine the airport’s programme are varied. Primarily however, it will include the Standard Busy Rate (SBR) which measures the number of passengers in the 30th busiest hour of use and is a globally standardised measure of passenger and visitor movements. Other factors involve aircraft movements (arrivals, departures, size of aircraft, passenger movements), baggage quantities (per passenger), visitors (those accompanying departing and arriving passengers), employees (per organisation), landside transport (public and private), secure areas, commercial and revenue operations, baggage trolleys, visitor ratio and dwell time (20mins in departures and 10mins in arrivals for passengers and 30 minutes for visitors – approx. 5,000 people per hour (visitors 0.2-0.5 per passenger)), passenger flows and processing rates.

Further, separate arrival and departure areas are required as per recent Civil Aviation Authority (CAA) regulations. Consequently, the terminal must have centralised facilities on a minimum two level split with vertical segregation.

It is also important to understand the trends within airport design culture. At present there is a move towards much larger airports than operationally required and the following programme calculations are based on averages.
calculated from formulas contained within Neufert, Blow and Hart. Contained within this literature are basic calculations to formulate an airport terminal. The outcomes have been combined with data from international airport terminals with a global perspective. This data specifically considers SBRs, passenger movements and floor size. Further information has been used such as population growth, climate, economic outlook, historical qualities, so as to adjust where appropriate. The outcome has been as follows. Initially it can be noted that data from the literature is calculated as a bare minimum and ignores any qualitative factors. Hence the areas calculated are much smaller than airports actually utilise today, according to research. Of note, airports are becoming a destination in their own right, where they are their own attraction in terms of shopping and added leisure facilities, such as movie theatres and parks. Consequently, a large number of non-travellers are frequenting airport precincts. This is consequently where all of the extra floor areas are utilised. The remaining excess floor space is divided into an even percentage gain over the remainder of the terminal facilities. There is a dichotomy however, that the latest security services and protocols involve much less space than they previously required, so space appears to be added as an investment in the growth of the future airport. The other factor that came to light was the number of airports undergoing expansion or relocation at present. Satellite terminals can be useful here, however, older terminals are being completely overhauled and the latest satellite terminals seem to be specifically hub terminals used only by a single airline.

Auckland airport will be no different. It needs excessive amounts of new parking and infrastructure as a minimum. Cargo facilities and operational assets such as the runway and control tower will be retained. The domestic and international terminals will be united so as to share many facilities in a more effective and efficient manner, where Pacific and Australian traffic will be considered domestic for the purposes of this project. This is in line with Auckland Airport’s long term shareholder plan.

As a consequence of the above the following initial figures have been achieved. See Appendix B for breakdown:

- **Landside Amenities** = 61,673 m² (excluding parking)
- **Airside Amenities** = 224,359 m² (excluding runways, cargo, catering, control tower)

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106 Auckland International Airport Limited, ”Annual Report 2014.”
• Estimated full building coverage of 286,032m², based on 18 hour operational day at 110,000 passengers per day and 40 million per annum

Further calculations were undertaken in an attempt to bring the above into line with the objectives of today’s airports. Specifically catering for a wider community, where airports become a destination in their own right. This means increasing spaces for ancillary activities such as shopping and restaurants.

Further programmatic calculations were then undertaken and median numbers utilised to devise the approximate space requirements for each area on both land and airsides. Appendix B breaks down these figures further. The adjusted size totals 511,390m².

Fig 3.2.1 Programmatic Calculations
3.3 ARCHITECTURALISING ‘NEW ZEALANDNESS’

In order to architecturalise within a culture, one must have an understanding of the application of New Zealand identity to physical construction, spatial arrangement, environmental attributes and architectural elements for which a building typology can be explored. One must also consider the architecture that has gone before.

1. Exploration of the Pa. One of New Zealand’s first architectural achievements came very early with the construction of the Maori pa – a fortified settlement. Pas were considered the socio-political centres of all iwi107 and were often constructed on terraced hillsides, particularly on headlands around the North Island. Extinct volcanoes also provided an advantageous setting to ensure an unhindered visual connection with the surrounds so as to safeguard land, people, weapons and food from invasion. Much like the airport today, the pa was designed for economic efficiency and advantageous pursuits.108

Where pas were constructed away from the shore, trenches and ramparts were built to protect the sides open to enemy attack. Trenches could also be utilised today, where non-intimidating boundaries are required, flooded with tidal waters, these incite a connection to the environment and could be utilised effectively around the proposed terminal at Auckland Airport.

Pas were often circular in shape, constructed by the very first settlers in New Zealand. These settlers introduced the circular types of Polynesian houses, modified to suit local conditions with at times, verandas appended. A radial repetition of boundary (terraces) is relevant for contemporary airports as we see increasingly stringent levels of security as each journey progresses.

107 The airport can be reminiscent of this and provide the resources to ensure traditions and activities continue to take place at the airport and within the immediate community.

Because of its positioning, shape and size, the pa did well to engage with its environment, and due to its coastal position, Auckland Airport evokes the same opportunities. Although a degree of height and varying levels will be utilised, the sheer scale of the structure will in fact render it long and low, as it engages with the flat South Auckland site which must, in effect, be fortified and yet, welcoming.

In order to achieve similar fortification to the pa some restrictions to passenger movements will apply, in keeping with CAA regulations. However, as was with the pa, the journey is important and emulates the initial stages of international travel. Upon approach, the airport and its outlook must be clearly perceived so as to provide transparency to counter the anxieties of travel chaos and provide implied way-finding where a sense of freedom, empowerment and liberalism prevail. Connection to the shoreline from the outset of the journey is vital and materials reminiscent to the pa should be utilised to amplify local building techniques, and enhance what would otherwise potentially be a dull and monotonous procession, with little connection to those left landside. Providing wharfs or cantilevers to the south west will increase the connection to the sea.

Fig. 3.3.1 North Island headland pa

109 JFK’s Terminal 4 achieves a profound degree of transparency by allowing passengers to be seen from the time one gets out of a car at the departure hall. This does a lot to help travellers find their way and decrease the anxiety of travel.
Of further note are the materials that were used in the construction of the pa, almost predominantly timber which was and is today, readily available (assuming the timber is no longer native to New Zealand). The palisades placed around the settlement at various levels were there to deter intruders, much like a fence, to deter and to contain, and are reminiscent of security processes as seen today.

Other materials used in early construction were, according to Michael King, obsidian and argillite. These have volcanic origins from extinct volcanoes such as Puketutu Island. The land reclaimed to build the current Auckland Airport runway was derived from local volcano sites and providing a link to the airport to acknowledge this is essential.

Frampton discusses the vernacular, and an international terminal at Auckland Airport must reflect the resources of the built area and meet the demands of the multiple cultures and rituals placed upon it.

2. Exploration of the Bach. The earliest European settlers arrived in New Zealand devoid of the resources to build. Consequently they utilised the “style and construction methods of Maori dwellings and adapted them according to European ideas of hygiene and comfort.” The essence of New Zealand building has today, not altered dramatically. It is steadfast and unwavering, highlighting “ingenuity and economy.”

An iconic piece of New Zealand architecture is that of the archetypal bach – timber framed, informal, pragmatic, simplistic in nature, yet rugged in its ability. Timber is still highly regarded and is currently the overwhelming preference for residential framing and cladding.

The bach was traditionally a seaside holiday home of basic amenity that typified New Zealand life. Even today the essence remains the same, where the elements have been “predetermined by traditional patterns of behaviour and association, modified only by economic limitation and social class.”

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3. Exploration of the Veranda. Verandas take their form originally from the whare, found traditionally at the heart of the pa, called roro. They are space defining and protective. They allow a relationship with the external environment, so are supremely ‘Kiwi’. The veranda can be interpreted in different ways such as places in between, in or out, here and there.

Baches also regularly have timber verandas which act as a transition from indoors to out. So too, the airport is a transitional place where passengers progress from New Zealand to the ether of airside, to a final destination.

Verandas ensure that the relationship between the building and the land hosts “a more intimate connection.” That connection enables protection from the extreme elements.

Architecturalising ‘New Zealandness’ is about the consideration of alternative inspiration, primarily concerned with spatial arrangement, with direction and a sense of welcome.

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It is important to remember that with “new global communications technologies, external cultural infiltration by migration, deregulation, and privatisation: the move towards a global world economy, with homogenisation of products in the interests of presenting a readily recognised consumer item: these processes directly undermine local identification and diversity.” Frampton discusses information and communication at length and suggests that consumers are overwhelmed by the global reach, which mitigates the desire and need for local affinities. Cultures have now become so overwhelmed with optimised technology that “the possibility of creating significant urban form has become extremely limited.” It can be argued however that this is not primarily the case with Auckland Airport, where optimal technology can override the need for additional space, thus allowing for further climatic and cultural consideration.

New Zealanders have fewer boundaries imposed upon them. The constraints are less obvious, because as an island nation, New Zealand is that much further away from other cultures; New Zealand has no-one to gauge against. Thus New Zealanders are intrepid and pioneering which can be architecturalised through technologies and innovation.

How to represent a mountainous and undulating landscape, where there is little rise above sea level? In New Zealand’s case, there is a wide range of topographies and multi-ethnic groups throughout. As Frampton suggests, much diversity can be found in both geological form and local tradition. This provides vastly different urban and rural landscapes throughout the country, which makes typology and topography a fundamental part of New Zealand’s identity. As such, this project ensures the integration of local architectural forms, regional customs, commercial activity and cultural sensibilities with specific geographic landforms showcased within the airport through varying levels, much like that of an Auckland volcano or North Island pa. These can further be represented through the journey of flight. Commencing the journey architecturally, the terminal then ascents with the sky where there is height in form and protection from the elements.

Frampton discusses the need to be distinct in terms of critical regionalism, in order to reflect a deep connection to place, while at the same time displaying a profound knowledge of contemporary forms and social realities. This concerns the exploration of the senses

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and how cultures experience the hierarchy of spatial arrangement. Within New Zealand this includes the dampness of forest air, the smell of freshly cut grass and the moment the heat and smell pours from the summer BBQ.

The shoreline continues to be extremely important to the New Zealand way of life, whilst beaches also serve as thresholds. The beach, much like the airport is located at the undesignated space of place. The Auckland Airport site follows a part of the Manukau Harbour’s shoreline and inlets. There will need to be an obvious connection where passengers understand the water’s edge is as much part of the journey as the airport’s thresholds.

Frampton discusses the architectonic and scenographic and how to manage the structural composition of architecture, specifically the terminal, to showcase honesty, structural tradition, whilst complementing the natural forces of climate and the progression of time. This is where structure outwardly displays its cultural value and environmental awareness. This is an ironic perception where the globalised and highly structuralised airport needs to be transparent, exposed and must relish New Zealand culture. The challenge is to ensure an airport terminal that is transparent in its essence. Architecture can be created from the “humblest New Zealand traditions. A shed can be merged into a more complex home and a basic shelter, such as the humble bus stop can be cultivated”117 to reflect the ‘New Zealandness’ of people at any given time.

This project explores nature within architectural spaces, how climatic conditions of the region are addressed, and what natural and artificial elements can be incorporated to enhance the experience of the terminal. The artificial interacts dynamically and widely with the ecological foundations. As Frampton discusses, one seeks a balance that provides both comfort and connection to place. Such technologies negate the regional variety where New Zealanders are innovative, outdoorsy and green. Globalisation has dictated how we should experience our surrounds through the elimination of the natural climate.

Dwell times are expected to lessen on landside as check-in becomes far more automated, yet there is a dichotomy between this and the welcoming gestures that individuals offer. Spaces must be created for people to gather and then progress with their journeys and perhaps the welcoming and ceremony commences in some respect, as early as the

baggage hall. Vantage points dictated by radial iterations and skyward apertures can be positioned to be reminiscent of the Southern Cross. These spaces must be climate aware and not overcome with globalised air-conditioning, the antithesis of 'New Zealandness' and the polarisation of the airport experience.

The need to honour the regional climate is obvious. It should be embraced as opposed to excluded and giant skylights, which reduce the need for artificial lighting, will endeavour to do this within the deeper areas of the terminal. The temperate climate of Auckland will also be acknowledged through passive means and complimentary materials.

Radial forms commence this journey metaphorically and literally. The rite of passage for a young New Zealander is the OE. The initiation of this journey quite often commences when family and friends gather to farewell their loved one. Eventually, on return, the circle will be complete when in turn, family and friends gather to welcome their loved one home, - the completion of the circle and ceremony. These personal experiences take place in a very public realm, as if grandstanding. So much so that there is a design opportunity to stage these moments and provide an audience of support for the occasion. This will showcase those attributes of New Zealanders that should be shared.

The overall form of the airport should be representative of the fundamentals of critical regionalism. It should provide fluid shapes that represent New Zealand’s liberal nature and free from constraint, it should be strong and determined, represented by repetition of form and offering unwavering exploration. As a symbol of unification of this bicultural nation there will be an inclusive roof. This roof will represent New Zealanders in the broadest sense, made up of many facets to acknowledge the diversity of cultures.

As part of the journey, users of the new terminal will be able to view the operational areas including check in and security through long channels of vision creating a sense of place, which in turn reduces the levels of anxiety and stress often associated with air travel. The journey will be efficient, with only the temptation to deviate the extended radial forms that offer freedom of exploration. As an egalitarian nation with a classless society, flat hierarchies would best be linked by the continuity of radial forms.

There is a requirement for ample green areas to embody New Zealand’s forestry industry and connection with the land. These green areas will be used for impromptu games of touch rugby and bull-rush. Greenery will be
used to mitigate hard surfaces resulting in a less clinical, friendlier experience.

Local materials will need to be utilised alongside innovative, pioneering technologies. Less formal space will be required with plenty of cross purpose uses. With local materials such as timber and locally produced steel, glazing and concrete, contemporary building techniques can be pioneered in conjunction with techniques used in the days of the pa where tying and weaving with natural materials such as flax was common. The key is diversity utilising various construction techniques to reflect a diverse culture.

Research suggests that New Zealanders are open and honest. This will be expressed by highlighting structure through types and placement of glazing, and exposing activity. Security will no longer be undertaken surreptitiously. Exposing services will be key to promoting the ease of travel. Glazed walls of both commercial and residential scale will be used not unlike the Rotherham house in Auckland which provides a “clear connectedness to a tradition of New Zealand building in attitude, form and materials… is dense while striving to be clear and optimistic.”

High studs will provide openness, freedom and light ensuring a connection to the sky and the natural environment. Barriers will be minimised so as not to provoke anxiety and to evoke a feeling of calm and laid-backness where new technologies will ensure efficiency of space and movement. Apertures will also be provided to expose the airport to climate, night, day and seasonal peculiarities, exposing the passenger to the procession of travel through navigation.

It is important in this overall journey that time and motion can be monitored particularly to enhance experience through witnessing the new day come and the old dissipate. These views to the east and west will be critical and verandas will be exposed to ensure a notion of connectedness. The uniqueness here is that New Zealand is the first on the globe to experience the new day.

Through sensory experience the traveller will encounter a multitude of textures on floors and walls to enhance their experience. These should be native materials that are unique to New Zealand.

There will be symbolic gestures to highlight the collective memory of the nation such as colour and pattern. There will be clusters of space reminiscent of both Maori and European, provided to provoke interaction.

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118 Ibid.
and highlight New Zealand’s bi-cultural status. Frampton’s work on myth and reality suggests that whilst New Zealanders accept they are formally bi-cultural, they very much perceive themselves as multi-cultural, particularly within the greater Auckland region where new immigrants predominantly reside. Cultural significance can only be achieved, should the local inhabitants, be they temporary or permanent, allow and can only fully partake in a culture, once they are accepting of it. However, New Zealanders in this respect are insecure and uneasy as the perception is that new cultures have a duty to adapt to the indigenous – to formally undertake what it is to be ‘Kiwi’.

Auckland airport is not so much a commuter hub, as it is an international airport which is reflective of New Zealand’s isolation and intrepid outlook. It is about personal growth, the growth of a young nation and coming of age, experiences of life. The airport brings people together under such a proposition that both the arrivals and departures halls will be poignant.
3.4 DESIGN DEVELOPMENT

1. Initial Brief. The initial design process commenced by way of the design brief which was formulated in order to lay solid foundations for the project.

It was important to understand how the initial research was to be undertaken, what the project hoped to achieve, airport functions, architectural elements to be explored and how they relate to one another. This brief has established itself as the benchmark for progression of the project.

2. Definitions. Concurrently with the above I began to research suitable definitions for critical regionalism, how the concept developed and what it means today. As a foundation I explored the initial literature from Liane Lefvaire and Alexander Tzonis, Kenneth Frampton and eventually Steven Moore. It does appear that tradition, although important, is not fundamental to current regionalism. Technology and ecology play a large part and critically, regionalism must be based in today’s climate (economic and otherwise). I repeated this process with the notion of globalisation.

3. Site. The next stage of the design process was to gain an understanding of the site and its requirements, particularly in terms of size and building placement. The first response was to understand the scale of the project and site available to AIAL, North Shore Aero Club, Whenuapai Airport and Auckland Aero Club at Ardmore. As a result of this exploration it was deemed that the current Auckland Airport site would be the most appropriate for this project. The reason for this early decision was two-fold. After initial site analysis was undertaken it was understood that AIAL holds 1500 hectares of land within its portfolio. This land accounts for much of the farmland to the west of the airport and the majority of commercial land to the north. It was concluded that there would be ample room for a larger facility on this site, with room to grow. Utilising the current site also meant that I could retain many of the ancillary services which included the control tower, runway, cargo facilities, engineering and catering areas. Critically, work on a second runway had commenced in 2007 but ceased due to the economic climate. The infrastructure for this runway has been established and the eventual extensions, acknowledged.
4. Transport. Key explorations here involved the analysis of those entering the Auckland Airport site. Specifically, critical information required included the distance visitors travelled, where their journey originated (particularly within the Auckland Airport catchment area) and their specific reason for the commute. Much of this information was recovered directly from AIAL and was analysed in conjunction with local business, their employment numbers and those who were on site for travel purposes. Further analysis was undertaken to track the current transport options to site and their capacities.

Many of those were found to be working within the airport precinct and the majority came by private vehicle, few people caught buses or rode bikes, and there are currently no train of ferry links established. Alternative routes to and from the airport precinct were proposed but private cars were a popular option particularly for those travelling, or collecting passengers due to the constraint of luggage.

With information from Auckland Council on future infrastructure projects and predicted numbers throughout the precinct, it became clear alternative transport would be required. The initial response was to plot the public transport options for 2044 when 40 million passengers would travel through the airport. This figure did not include those who were travelling to the expanded precinct for other purposes such as commercial reasons. It was established that rail links will be key to the success of this project and ultimately commence from Britomart in the CBD. Two tracks will be utilised with expansion in mind. It is considered that the airport train will eventually be en route to more southern destinations.

I explored the prospect of having sea links to the airport from downtown Auckland. Unfortunately with the tidal patterns and sea bed depth, this would not be feasible as it stands today. Further resources would have to be invested and the local community in agreement.

Improved cycle paths and pedestrian access to the site will also be included. However, private car use is something Aucklanders are unlikely to forego in the near future and direct roading links from the CBD and corresponding motorway connections will be required.

Multiple lanes will be constructed within the site that split vertically in order to separate arrivals and departures traffic. Two lanes per level will be dedicated to taxis and buses and there will be two lanes of loading zones for the length of the departures and arrivals kerb. Data analysed on dwell times, and passenger movements saw the need to create around 400m in length of kerbside per terminal, at the drop off or collection areas, by 2044.
However there will be a proposal to have bags dropped kerbside and this will double the amount of space required by private vehicles in drop off zones as dwell times double. The response to this was to have two drop lanes with multiple access lanes, thus creating around 900m of loading zones where strict time limits will be imposed.

Ultimately to deal with the increase in the requirement for parking facilities, there will need to be expanded car parking buildings. Currently there is one multi-storey car park within the precinct. It sits above ground, catering mostly for long term or domestic passengers. Using parking precedents and Neufert data on waiting times, a multi storey car park will be required with placement directly underneath the terminal. The structure and placement of the car park will ensure that any future expansion can be managed. The precinct will have to cater for over 20,000 staff and visitor cars that will visit the airport on a daily basis by 2044, according to an analysis of AIAL data.

Fig. 3.4.1 Airport showing transport links
5. Building Footprint. This was critical in understanding the effects a larger airport might have on the current site. It also exposed the facilities that could be retained and which needed to be replaced. As a response, a number of airports were researched as precedents and their typologies considered. At this stage AIAL had predicted to receive 25 million passengers per annum in by 2025. These airports provided vital information in terms of size, movements, connections and site location. Outcomes included moving the footprint closer to the shoreline, redesigning the apron areas, maximising a second runway north of the existing runway and establishing that the building footprint need be no more than 140,000m².

However, this was short lived. AIAL soon after released their vision for the future. This required an airport that combined domestic and international terminals and a second extended runway for 40 million passengers per annum. This, said AIAL, would be required and subsequently achieved by 2044. To keep in line with this development the brief for this project was extended. Designing an ‘interim’ airport, when the ‘client’ effectively required responses to a much greater vision, was of little value.
<table>
<thead>
<tr>
<th>Airport</th>
<th>Pax pa</th>
<th>Footprint m²</th>
<th>Gates</th>
</tr>
</thead>
<tbody>
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<td>Auckland Airport, New Zealand (AKL)</td>
<td>14 million</td>
<td>85000</td>
<td>22</td>
</tr>
<tr>
<td>Heathrow Terminal 5, London (LHR)</td>
<td>28 million</td>
<td>70,000</td>
<td>60</td>
</tr>
<tr>
<td>Fort Lauderdale Hollywood Airport, Florida (FLL)</td>
<td>25 million</td>
<td>74,000</td>
<td>57</td>
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<tr>
<td>Stansted Airport, Essex (STN)</td>
<td>17 million</td>
<td>85,700</td>
<td>125</td>
</tr>
<tr>
<td>Zurich Kloten Airport, Switzerland (ZRH)</td>
<td>22 million</td>
<td>144,000</td>
<td>90</td>
</tr>
<tr>
<td>Changi Terminal 3, Singapore (SIN)</td>
<td>22 million</td>
<td>95,000</td>
<td>28</td>
</tr>
</tbody>
</table>

Fig. 3.4.2 Precedent airports showing footprint
6. Functional Typologies. Different functional typologies have been explored independently of one another. This was an important step in understanding the functional relationships within the airport and the degree to which these must be organised. Precedents for each were identified and variations explored. The response to this ensured the most efficient typology was chosen – curvilinear. Precedents show that there is a resurgence in radial form, as expansion options are explored. Variations of such were also explored and vertical segregation was selected so as to ensure efficiency and that all ICAO regulations were met. From the precedents studied this is the most common type of airport terminal.
7. Process Flow. From very early on within the project I understood how vital the functional relationships within an international airport are. These functions need to be effective operationally and financially, and maximise process through design. The airport is without doubt, process driven. The exploration was to understand the hierarchy of processes and the length of times and spaces involved.

Due to regional and international regulations most of the airport process is not flexible and must follow a specific order as dictated by the CAA and other international governing bodies such as the ICAO and the International Air Transport Association (IATA).

The following diagram is a comprehensive representation for international air travel and aided in my exploration of area sizes by way of percentiles. It lead to an understanding of the ancillary public space now required in airports, as if the original purpose of the airport is somewhat secondary.
Fig. 3.4.5 Airport Process Flow
8. Technical and Operational Requirements. Notwithstanding the reinvention of the airport, ancillary services were explored through the use of precedents. Airports are process driven by nature and there was little deviation achieved by this process. Ultimately due to regulations of governing bodies, no processional changes were made from the assessment of precedents.

9. Expansion Requirements. Through research it was understood that an aspect of current airport design concerns expansion. Traditionally radial forms have been difficult to expand often resulting in an additional terminal building where resources are no longer centralised. However, through exploration of radial forms it became apparent that with iterations, extension can be achieved. In the long term it is conceded that there will need to be a detached terminal to meet consumer demand. However, the infrastructure from the rail links would provide the basis for an underground transfer and due to locality would still be able to utilise the centralised operational services. The northern runway will be constructed in the forthcoming years and will therefore provide the secondary runway and apron areas required for an expansion such as this.

10. Transparency and Way-finding. One of the most common pieces of feedback from travellers is the difficulty they have in navigating the airport terminal. The stress and anxiety provoked from such experiences is in stark contrast to the way New Zealander’s are perceived. Research suggests the use of colour is important to enable easy passage. Many airports utilise colour and signage already, as per the precedents analysed. Through sketching and understanding the initial draft floor plans it became apparent that the route needed to be centralised within the terminal. The option is now there to deviate, however, a direct route has been establish through the realignment of floor plans on both ground and upper levels.

11. Materials. I wanted to explore the viability of utilising traditional and readily available materials. Fortunately within the Auckland area, critical building supplies are manufactured and/or supplied. Timber has been a key element historically in New Zealand building and it is therefore important to utilise this within the structural elements of the build and ensure they are exposed to provide a transparency coinciding with the journey and show cased as honesty of structure which included the use of timber laminate beams.
Fig. 3.4.6 Initial plans and way-finding
Steel will be used for structural entities and glazing will be used extensively to showcase the transparency of operations and ease of passenger journey. In doing so, the airport will have less boundaries and more effective sight lines.

12. Kiwiana. It was important to explore the ideas of symbols and in particular, Kiwiana and to differentiate between the two. Kiwiana is regarded as kitsch and research suggests that this idea of symbolism works to exclude others, “Kiwiana works to alienate others… Resorting to images that depend on nostalgia is a way of excluding newcomers.”¹¹⁹ Yet there becomes a delicate balance between obvious identity and theming and actually expressing a people in a more sophisticated and spatial way. The process is dynamic but it is imperative for an airport at Auckland to be open, restful, laid back and liberal without theme. An airport devoid of Kiwiwana ensures visitors are welcome and not excluded.

13. Exploration of the Circle. I considered very early on a number of well documented and perceived symbols that could represent the New Zealand identity. These symbols came tangibly at times, but were more metaphorical at others. An initial line of enquiry began by looking at primary shapes, their meaning and how they would correspond to this process oriented piece of architecture. Correspondingly I began reviewing airport precedents from very early in the history of aviation. What I discovered were a number of circular shaped, single use buildings such as Gatwick’s first airport. These I discovered were long out of favour, primarily due to expansion restrictions. However they were beginning to vaguely reappear through the popular expansion strategy of creating satellite and hub terminals as seen in the States where hub and domestic traffic play a massive part in the aviation industry. Examples include Kansas City International Airport, JFKs JetBlue hub terminal, Paris Charles de Gaulle’s Terminal One, North Korea’s Pyongyang Sunan International Airport, Lyon-Saint Exupéry Airport, and further, many of South Korea’s Seoul Incheon Airport design competition entries were informed by similar radial contributions.

¹¹⁹ Claudia Bell and Steve Matthewman, eds., Cultural Studies in Aotearoa New Zealand: Identity, Space and Place (Melbourne: Oxford University Press, 2004), 177.
These precedents informed early design ideas which were required to be produced in parallel to inform and understand the functional relationships within this international airport.

In parallel to the above some of the strong characteristics of New Zealanders that were prominent in the initial research included the laid back, welcoming, steadfast, democratic and determined. The laid back needed to be architecturalised first and I began to physically explore such characteristics through drawn images. Determination became repetition of shape, steadfast was enduring and solid, but it was welcoming that appeared to invoke drawings of openness and ease within a democratic ideal.

What transpired from the above was circular, democratic in nature and steadfast in its infinite lines. The spatial organisation was to be based upon the radial. The following exploration then turned to uncovering New Zealand democracy by way of the circle. A number of precedent buildings were explored in terms of hierarchical spatial arrangements including the Beehive and European Parliament. However, this I learned quickly was to lead to little with varying research opinions on what a circle essentially stood for and that it might actually be less democratic than other primary
forms. I soon began to change direction and returned to the interpretations and iterations of the Southern Cross.

14. Southern Cross. The Southern Cross forms an integral part of New Zealand culture. The four main stars; Alpha, Beta, Gamma and Delta Crucis can be identified by way of the two Pointers and sit all year round in the Southern Hemisphere night sky. In autumn the Cross is upright and high overhead, come spring it is upside down but sits low in the sky. Once a patriotic song for New Zealand’s war heroes, it is symbolic of national pride, depicted on the nation’s flag.

The Southern Cross is well known as a global navigational tool, depicting south. Exploration began as to how the Cross may be embodied within the initial design. It was felt that it held poignancy as it represents New Zealand, navigation and journey. The ideas became based on a cross axis with four individual hubs representing each star. The size of each radial form was explored through understanding basic astronomical data including distance from the earth and positioning in the night sky. Radial forms had been used in early airport terminals but were swiftly replaced by rectilinear primarily due to ease of way-finding and expansion requirements.

The initial response was to understand iterations of radial compositions, to define space whilst representing a continual journey. Furthermore, these early forms began to resemble that of the North Island’s traditional headland pas, which were very much at home in Auckland in the 19th century.

Further illustrative exploration began to merge a number of radial inflections as plotted on a cross, within a circumference. What this displayed were fluid lines, the symbolism of the Southern Cross, circular iterations and repetitions, determination and a clear functional relationship segregated by these iterations providing direction and simple way-finding. Radial ultimately works in terms of aircraft apron areas, centralised facilities and expansion.

The response then became to ensure that the Southern Cross is available year round in the night sky over Auckland Airport. The cladding patterns explored in conjunction with evening site visits were orientated to ensure that the path of the Cross was exposed for each season through apertures within the airport structure. They were also arranged for ease of way finding.
Fig. 3.4.8 Exploration of the Southern Cross

Fig. 3.4.9 Initial cladding pattern
15. Connection to the Water. New Zealand is an island nation and has an automatic affinity with the ocean. The airport is situated on the water’s edge and it is important to retain a natural connection, particularly for those arriving and departing. Ways to specifically engage with the water were explored through transport links by sea and primarily through a visual connection. Another archetypal architectural icon is that of the wharf or jetty. These are prevalent all over the country help to engage New Zealanders with water. Maintaining a connection with the water is vital and further explorations about how to achieve this have been undertaken. Tidal water reflects the specific environment and verandas and wharfs are seemingly the best way to gain this connection. Having the water engage with the building and not simply the reverse is a valid exploration and is central, literally and metaphorically to the regionalism of the airport as tidal water flows into the middle of the development.

16. Ceremonial Practice. Spatial awareness ensures that we acknowledge the difference between physical space in New Zealand where life is lived indoors and where community interacts in the wider environment. It is important to create space where the local community interrelates and more so, with those from foreign communities. This is all about how we live, what we do and when we do it – it is about openness and connection. In New Zealand the definition of place may not necessarily be where life and community traditionally interact. The airport must be allowed to be defined by our social character which Frampton advocates by way of spatial awareness, connections and structure.

As discussed, one of the defining elements of New Zealand life is the OE. It is also about supporting those that leave and those that return. Through exploration and many site visits I became aware of the ceremony and ritual involving those that travel. Unique to New Zealand is the gathering en masse of family and friends whenever a New Zealander departs or returns to the country. This is apparent through all of New Zealand’s dominant cultures. Whether they be acknowledged through the haka, powhiri, kava ceremony or even a Japanese tea ceremony. Exploring ways to acknowledge this lead me to understand that these are not private displays of affection. They are very much a public practise and I have been trying to find ways to acknowledge this coming together of people, ceremony, song, dance, food and drink. This path led me to the idea of grandstanding. Providing space for those to perform, partake and observe. Rows of seating and central performance space are required, ideally with
sight line connections throughout the various processes within the airport. These areas will primarily be maintained within the arrivals and departures concourse, landside.

17. Roof Exploration. It was very important form early on in the design process that the airport terminal represented one nation. New Zealanders are well known as egalitarian and harmonious amongst culture. I began to explore how this unification, as perceived abroad, could be represented in a physical typology.

Through precedents observed, it became apparent that centralised facilities and services within airport typologies were favoured. This is primarily down to cost where all operational processes are located within a single area. It is also preferable for those travelling, as it makes for shorter distances between amenities, gates and lounges, which in turn creates increased dwell times.

However, my initial explorations of form began to heed radial iterations, which were not conducive to a wholly centralised plan, beneath a single roof. I began to explore different types of cladding propositions as above and began to understand that the airport form could be, as such, under one skin. As these shapes progressed into 3D form, I began to understand how these forms could radiate across the kerb areas to protect people from the elements, how they could passively ventilate, enhance the journey, be structural yet transparent. The roof began to demonstrate a connectedness to the earth and I believed it to represent flight and journey, as we identify with a flightless, nocturnal bird.

Fig. 3.4.10 Roof Inspiration
Fig. 3.4.11 Informed roof design
18. *Exploration in Plan.* This formed the initial exploration of spatial arrangement and building footprint with that of the precedents previously researched.
19. *Exploration through Section.* This is where the radial concept is first explored in 3D in an attempt to qualify the functional with the spatial.

Fig. 3.4.13 Exploration in Section
Fig. 3.4.14 Exploration in Section 2
4.0 CONCLUSION

This research project looked to investigate issues that contribute to recognising architecture by way of its place. This is key in an ever expanding global society where the use of local resources, such as culture and site, are vital in order to connect people with a place that contributes to a sense of belonging.

Through such research this project identified the contributing factors as to how a space becomes a place, whilst redefining critical regionalism and condensing the broader contemporary theory.

In order to evolve and sustain a sense of place this project successfully amplified regional interdependencies that are cultural, social and physical, as opposed to being homogenised by a globalised world.

Furthermore, this project successfully attempted to define and establish formal and spatial qualities inherent to a New Zealand regionalist culture. The research also assisted in forging a national identity based on the advancement of considered theory. This was applied accordingly to an appropriate architectural response, specifically an alternative
international and domestic terminal at Auckland Airport that enhances a
traveller’s sense of arrival to or departure from, whilst ensuring an
energising quality to an otherwise prosaic procession of movement from
one place to another, whilst ensuring the traveller can readily identify
with the given location.

Furthermore, the project has culminated by way of a number of relevant
and sympathetic architectural responses, – an alternative international
terminal at Auckland Airport, which reflects current regional planning
issues, increased urban densification and globalisation, whilst reflecting
what it means to reside within the Auckland region and what it means to
be a New Zealander. This established the needs required to formulate a
sense of place and belonging within the confines of the airport terminal.

Finally, this project identified the specific aspects of critical regionalism
that contribute to developing a space that portrays a sense of place; one
that identifies with people through commonalities such as culture,
environment, community, space, technology and shared experience.

Finally, this project avoids the inclusion of a New Zealand ‘theme,’
ensuring there is a minimum of kitsch and tawdry. The project
alternatively provides an application of New Zealand’s unique and
innovative culture to functional, spatial and structural considerations.


Pallasmaa, Juhani. The Eyes of the Skin: Architecture and the Senses. Chichester: John Wiley & Sons Ltd., 2012


http://en.wikipedia.org/wiki/Auckland_Airport

6.0 APPENDIX
6.1 APPENDIX A

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Programme Calculations

Estimated full building coverage of 160,000m², based on size and operational figures of airport precedents:

Landside Amenities = 56,820m² (excluding parking)

1. Departures/Retail/Duty Free, Food and beverage outlets (70% less profitable than airside)
   - 3.5m per person x 5000 pax per hour = 17,500m² departing
     - passengers/visitors (1.5 per passenger based on local cultures)

2. Arrivals/Retail/Duty Free, Food and beverage outlets (70% less profitable than airside)
   - 3.5m per person x 5000 pax per hour = (2000/6+3000/2)
     1833 or 2000 x 3.5m per person = 7,000m² arriving at 30% of expected passengers/visitors (1.5 per passenger based on local cultures)

3. Check in (2000 passengers per hour based on 25 million pa including transfers)
   - Peak number incl visitors = 5000/40 = 125 check in desks at 3m centres and depth of 2m = 6m² x 125 = 750m² + queue space

   - Queue depth 40 pax at 6m² = 240m² per check out. Total queueing area 240m² x 125 = 30,000m²
   - Retail - F x 10, M x 8 and x 3 urinals x 2 unisex accessible
   - Corporate offices – F x 6, M x 5 and 3 urinals, 2 x unisex accessible
   - Check In – F x 4, M x 4 and x 2 urinals x 2 unisex accessible
   - Arrivals Hall – F x 6, M x 5, and 3 x urinals x 2 unisex accessible
   - Departures Hall – F x 7, M x 6, and 3 x urinals x 2 unisex accessible

5. Observation decks (design dependant)

6. Parking = 9,000 with rail and sea links to be considered
   - 2.5 x 5.7m per park, excluding disabled, parent, taxi and bus = 14.25m² x 9,000 = 128,250m²

7. Kerbside Drop Off/Pick Up (based on 2000 passengers landside per hour)
   - Number of passengers kerbside per hour = 1000 with 1.7 passengers per car/taxi (1000/1.7) = 588 per hour. Number
of cars at any one time (588/40 with 1.5 minutes wait time) = 16. Length of car+ is 7 m x 16 = kerbside length at 112 m x 5 m depth = 560 m²

8. Corporate offices including security, police, airport etc = 1200 m²

**Airside Amenities = 102,485 m²** (excluding runways, cargo, catering, control tower)

9. Arrivals/Retail/Duty Free, Food and beverage outlets (70% more profitable than landside)
   - 3.5 m² per person at 2000 per hour = 7,000 m² at 70% of passengers

10. Departures/Retail/Duty Free, Food and beverage outlets (70% more profitable than landside)
    - 3.5 m² per person at 2000 per hour = 7,000 m² at 70% of passengers

11. Departing Security at Xray 200 per hour at 2000 passengers per hour = say 12 Xray machines at 5 m x 4 m = 20 m² x 12 = 240 m². Queues of 40 pax at each at 2 m x 2 m = 4 m² x 40 = 160 m² per queue at centres of 5 m per machine = 5 m x 160 = 800 m² x 12 machines = 9600 m²

12. Toilets and shower facilities at an average of 0.7 x 1.64 + basins x 250 = 290 m²

- Retail – 11800 m² = F x 20, M x 18 and 6 urinals x 4 unisex accessible
- Arrival areas – 16471 m² = F x 28, M x 24 and 7 x urinals, 4 x unisex access
- Departure Areas – 17947 m² = F x 30, M x 27 and 7 x urinals, 4 x unisex access
- Corporate Offices – F x 6, M x 5 and 3 urinals, 2 x unisex accessible

13. Corporate offices including security, police, airport, MAF etc = 1200 m²

14. Cargo facilities (retain current facilities)

15. Observation decks (design dependant)

16. Catering facilities (retain current facilities)

17. Arrival Customs at Xray 200 per hour at 2000 passengers per hour = say 12 Xray machines at 5 m x 4 m = 20 m² x 12 = 240 m². Queues of 40 pax at each at 2 m x 2 m = 4 m² x 40 = 160 m² per queue at centres of 5 m per machine = 5 m x 160 = 800 m² x 12 machines = 9600 m²

18. Immigration with 30 desks 3.5 m x 3 m = 10.5 m² x 30 = 315 m² with 70 passengers per desk per hour with say 50% queue = 35 pax x 4 m² space = 140 m² x 3.5 m = 490 m² centres x 30 desks = 14700 m²
19. Airbridges – 4.5m height clearance with A380 considerations. Min length 10m apron clearance and 10m extension per bridge.
   20m x 2.5m = 50m² x 60 (based on Heathrow T5 calculations) = 3000m² including A380 twin airbridge requirements

20. Gates x 60 = 1.5m² per person at 100% load factor of largest average aircraft at 500 = 750m² x 60 = 45,000m²

21. Bagage Claim at 1000 passengers per hour = 10 units at 600m² per unit = 6000m² and with service level of 2m² x 1000 = 2000m². Assume wide bodied aircraft with 100% load factor. 500 x 10.

22. Airline Lounges = 20m x 15m x 8 = 2,400m²

23. Transit Lounges = 20m x 15m x 3 = 900m²

Estimated full building coverage of 286,032m², based on 18 hour operational day at 110,000 passengers per day and 40 million per annum:

Landside Amenities is 3050 per hour = 61,673m² (excluding parking)

24. Departures/Retail/Duty Free, Food and beverage outlets (70% less profitable than airside)
   - 4.5m² per person (exceeds level of service A)
   - 3050 pax per hour plus 1.5 visitors per passenger (based on local culture) = 7625 people per hour
   - Peak factor, 50% in approx. 20 minutes = 4525 peak x 4.5m² = 20363m²

25. Arrivals/Retail/Duty Free, Food and beverage outlets (70% less profitable than airside)
   - 3.5m² per person (exceeds level of service A)
   - 3050 people per hour plus 1.5 visitors per passenger (based on local culture) = 7625 people per hour
   - 7625 people per hour = (3050/6 + 4575/2) 2596 peak passenger flow and dwell times x 4.5m² = 11682m²

26. Check in includes those being checked in at any given time and is irrespective of configuration of desks.
   - 3050 pax per hour
   - Peak factor, 50% in approx. 20 minutes (equiv. number per hour) = 4575
   - Number of desks 4575/40 = 115 check in desks at 5m centres and depth of 5m = 25m² x 115 = 2875m² + queue space
   - Queue depth 50 pax at 2.7m² (exceeds level of service A) = 135m² per check in desk. Total queuing area 135m² x 115 = 15525m²

27. Toilets at an average of 1.2 x 2.64m = 3.17m² + basins x 214 = 678m²
   - Retail - F x 24, M x 18 and x 12 urinals x 2 unisex accessible
- Corporate offices – F x 18, M x 12 and 10 urinals, 2 x unisex accessible
- Check In – F x 18, M x 12 and x 10 urinals x 2 unisex accessible
- Arrivals Hall – F x 18, M x 12, and 10 x urinals x 2 unisex accessible
- Departures Hall – F x 12, M x 10, and 8 x urinals x 2 unisex accessible

28. Observation decks (design dependant)

29. Parking = 12,000 with rail and sea links to be considered
   - 2.5 x 5.7m per park, excluding disabled, parent, taxi and bus = 14.25m² x 12,000 = 171,000m²

30. Kerbside Drop Off/Pick Up (based on 3050 passengers landside per hour)
   - Number of passengers kerbside per hour = 3050 with 1.7 passengers per car/taxi (3050/1.7) = 5185 per hour.
   - Number of cars at any one time (5185/40) with 1.5 minutes wait time) = 130. Length of car+ is 7m x 130 = kerbside length at 910m x 5m depth = 4550m²

31. Corporate offices including security, police, airport etc = 6000m²

**Airside Amenities = 224,359m²** (excluding runways, cargo, catering, control tower)

32. Arrivals/Retail/Duty Free, Food and beverage outlets (70% more profitable than landside)
   - 3.5m² (exceeds level of service A) per person at 3050 per hour = 10675m² at 70% of passengers

33. Departures/Retail/Duty Free, Food and beverage outlets (70% more profitable than landside)
   - 3.5m² (level of service A) per person at 3050 per hour = 10675m² at 70% of passengers

34. Security at Xray at 3050 passengers per hour = say 44 Xray machines at 5m x 5m = 25m² x 44 = 1100m².
   - Queues of 40 pax at each, at 3.5m² = 140m² per queue x 44 at centres of 5m x 5m per machine = 25m² + 140m² x 44 machines = 7260m²

35. Toilets and shower facilities at an average of 1.2 x 2.64m = 3.17m² + basins x 250 = 793m²
   - Retail – 11800m² = F x 20, M x 18 and x 6 urinals x 4 unisex accessible
   - Arrival areas – 16471m² = F x 28, M x 24 and 7 x urinals, 4 x unisex access
   - Departure Areas – 17947m² = F x 30, M x 27 and 7 x urinals, 4 x unisex access
   - Corporate Offices – F x 6, M x 5 and 3 urinals, 2 x unisex accessible
36. Corporate offices including security, police, airport, MAF etc = 4000m²
37. Cargo facilities (retain current facilities)
38. Observation decks (design dependant)
39. Catering facilities (retain current facilities)
40. Arrival Areas (20,000,000pa / 54794 per day = 3050 per hour based on 18 hour service day)
   - Immigration = 3050 (max at any given time) passengers per hour with 48 desks at 25m² = 1200m². Queues of 20 pax at each, at 3.5m² = 70m² per queue x 48 at centres of 3m x 5m per counter = 15m² + 70m² x 48 = 4080m²
   - Customs = 3.5m² per person x 3050 an hour = 10675m². Queues at 40 people at 3.5m² = 140m² per queue x 24 at centres of 3m x 5m per counter = 15m² + 140m² x 24 = 3720m²
   - Gates – Pier configuration. 3.5m² per person (exceeds level of service A) at 100% load factor of combination of aircraft sizes (max A380 525 Capacity) = 525 x 3.5m² = 1838m² x 30 = 55125m²
   - Airbridges – 4.5m height clearance with A380 considerations. Min length 10m apron clearance and 10m extension per bridge. 20m x 2.3m width = 46m² x 30 (based on Heathrow T5 calculations) = 1380m² including A380 twin airbridge requirements
   - Baggage Collection 3050 passengers per hour (exceeds service level of A) 4.5m² = 13725m². Assume 50% arrive by wide bodied aircraft (future proofing) and 50% arrive by narrow bodied aircraft with 100% load factor (525 in A380 and 289 in 757-300). 1525/525 = 2.9 or 3 aircraft and 1525/289 = 5.3 or 6. Say 6 narrow bodied devices (4.5 x 289 x 6 = 7803m²) and 3 wide bodied devices (4.5 x 525 x 3 = 7088m²) = 14891m²
   - Transit Lounges = 20m x 40m x 2 = 1600m²
41. Departure Areas Arrival Areas (20,000,000pa / 54794 per day = 3050 per hour based on 18 hour service day)
   - Security (based on 3050 passengers per hour with two items of baggage). Machine capability is max 600 per hour with 2 xray units and 1 x metal detector 5m wide x 5m deep = 25m² each station x minimum 8, ideally 16 = 400m². Queues are hard to predict due to volatile nature of process at 40 people at each, at 3.5m² = 140m² per queue x 24 at centres of 3m x 5m per counter = 15m² + 140m² x 24 = 2480m²
   - Immigration = 3050 (max at any given time) passengers per hour with 48 desks at 25m² = 1200m². Queues of 20 pax at
- **Customs**: $3.5\text{m}^2$ per person x 3050 an hour = $10675\text{m}^2$.

- **Queues**: At 40 people at $3.5\text{m}^2$ per queue x 24 at centres of $3\text{m} \times 5\text{m}$ per counter = $15\text{m}^2 + 70\text{m}^2 \times 48 = 4080\text{m}^2$.

- **Gates – Pier configuration**: $3.5\text{m}^2$ per person (exceeds level of service A) at 100% load factor of combination of aircraft sizes (max A380 525 Capacity) = $525 \times 3.5\text{m}^2 = 1838\text{m}^2 \times 30 = 55125\text{m}^2$.

- **Airbridges** – 4.5m height clearance with A380 considerations. Min length 10m apron clearance and 10m extension per bridge. $20\text{m} \times 2.3\text{m}$ width = $46\text{m}^2 \times 30$ (based on Heathrow T5 calculations) = $1380\text{m}^2$ including A380 twin airbridge requirements.

- **Airline Lounges**: $20\text{m} \times 15\text{m} \times 8 = 2400\text{m}^2$.

- **Baggage Handling Areas**: $1000\text{m}^2$.

- **Transit Lounges**: $20\text{m} \times 15\text{m} \times 2 = 1000\text{m}^2$. 
6.3 APPENDIX C

Final Presentation Drawings