

Industrial Revolutions

Examining the potential of redundant railway land within provincial New Zealand cities.

Industrial Revolutions

Examining the potential of redundant railway land within provincial New Zealand cities.

Joseph Bailey

Submitted in partial fulfillment of the Master of Architecture (Professional)

Victoria University of Wellington

School of Architecture

Abstract

Economic and technological shifts over the last half of the 20th century have seen widespread changes in the way the New Zealand rail network operates, and are continuing to lead to the eminent decline of sections within the network as priorities shift to ensure its long-term survival as a whole. The decline in rail operations to the present point has already seen railway stations, goods yards and associated industrial areas in many rural areas and some smaller centers falling into disuse, and it is inevitable that many more will follow.

The aim of this research is to identify and analyze these rail facilities, both redundant and operational, within provincial New Zealand cities with the intention of establishing possible strategies for re-integrating these sites back within the surrounding urban fabric of their respective cities, while retaining links to the cultural and industrial heritage of the sites in terms of the role they played in the birth and development of provincial New Zealand.

A review of relevant literature has been conducted in unison with a graphic analysis of both current and redundant rail sites in ten provincial New Zealand cities.

The former railway goods yard in Oamaru was selected for the design case study as it encompasses the common issues identified throughout the graphic analysis, while also presenting a number of unique issues.

In response to the initial aim of this research, the design case study for Oamaru concludes that, once redundant, these former rail facilities can be successfully re-integrated with their surrounding urban fabric, without compromising the unique inherent cultural and industrial heritage of the site.

Acknowledgements

Firstly, I would like to thank my parents, Raelene and Gilbert, for their unrelenting support and encouragement over the last five years, always to be counted on for advice, clarity and a reassuring word in moments of stress and severe sleep deprivation.

To my tutor, Chris McDonald, thank you for your guidance, support and supreme patience as this research has research has taken form. We got there eventually.

And finally, I would like to thank my classmates, with whom I have shared many experiences, emotions, beers and late nights in getting to this stage of our degree. As long and hard as the road has been, I have thoroughly enjoyed it and will take away great memories of our time together at the SOAD.

Table of Contents

Abstract	v
Acknowledgements	vii
Table of Contents	ix
List of Figures	xiii
1.0 Introduction	1
2.0 Literature Review	7
2.1 Background	7
2.2 Integration & Connectivity	9
2.3 Recognising Industrial Heritage	16
2.4 Discussion	22
3.0 Survey of Provincial Railway Land	23
3.1 Figure Ground	25
3.2 Street Grid	26
3.3 Zoning	27
3.4 Green-space	28
3.5 Land Forms	28
3.6 Discussion	29
4.0 Oamaru Case Study - Background & Briefing	53
4.1 History of the Oamaru Harbour	55
4.2 Harbourside Case Study	59
4.3 Design Implementation	62
4.4 Design Criterea	64
5.0 Oamaru Case Study - Design	69
5.1 Masterplan	71
5.1.1 Vehicle Movement	77
5.1.2 Pedestrian Movement	79
5.1.3 Green Network	81
5.1.4 Rail Sidings	83
5.1.5 Built Fabric	85

5.2 Architectural Scale Development - Meek's Elevator Building	91
5.2.1 Architectural	93
5.2.2 Urban	95
5.3 Discussion	104
6.0 Discussion/Conclusion	109
Bibliography	115

List of Figures

All drawings & photographs are the authors own, unless stated otherwise.

Literature Review

Fig 1: Investigation of connectivity across rail sites in provincial New Zealand cities

Fig 2: Creating connections within an existing network

Sourced from Urban Design Compendium, 2007. Retrieved from <http://www.urbandesigncompendium.co.uk>

Fig 3: Investigation of rail associated industrial structures in provincial New Zealand cities

Mapping Studies

Fig 4: Survey Site Locations Map

Fig 5: Figure Ground Plan Whangarei

Fig 6: Additional Graphic Analysis Whangarei

Fig 7: Figure Ground Plan Rotorua

Fig 8: Additional Graphic Analysis Rotorua

Fig 9: Figure Ground Plan Gisborne

Fig 10: Additional Graphic Analysis Gisborne

Fig 11: Figure Ground Plan Whanganui

Fig 12: Additional Graphic Analysis Whangarnui

Fig 13: Figure Ground Plan Palmerston Nth

Fig 14: Additional Graphic Analysis Palmerston Nth

Fig 15: Figure Ground Plan Masterton

Fig 16: Additional Graphic Analysis Masterton

Fig 17: Figure Ground Plan Blenheim

Fig 18: Additional Graphic Analysis Blenheim

Fig 19: Figure Ground Plan Greymouth

Fig 20: Additional Graphic Analysis Greymouth

Fig 21: Figure Ground Plan Timaru

Fig 22: Additional Graphic Analysis Timaru

Fig 23: Figure Ground Plan Oamaru

Fig 24: Additional Graphic Analysis Oamaru

Pre Design

Fig 25: Oamaru Harbour (1870)

Photograph sourced and reproduced with permission from the North Otago Museum archive collection, Oamaru

Fig 26: Oamaru Harbour (1879)

Photograph sourced and reproduced with permission from the North Otago Museum archive collection, Oamaru

Fig 27: Oamaru Harbour (1962)

Photograph sourced and reproduced with permission from the North Otago Museum archive collection, Oamaru

Fig 28: 'Harbourside' Stage One Plan drawing

Sourced from Harbourside Landscape Design Strategy, 2008. Retrieved from www.waitaki.govt.nz/NR/rdonlyeres/F4D4DBF8-738F-4CD7-A898-102CC624D020/55941/harbourside.pdf

Fig 29: Existing railway goods shed

Fig 30: 'Harbourside' railway goods shed drawing

Sourced from Harbourside Landscape Design Strategy, 2008. Retrieved from www.waitaki.govt.nz/NR/rdonlyeres/F4D4DBF8-738F-4CD7-A898-102CC624D020/55941/harbourside.pdf

Design Case Study for Oamaru

Fig 31: Graphic Analysis of wider Oamaru context

Fig 32: Aerial photograph of existing railway goods yard in Oamaru

Sourced & reproduced with permission from the GIS service at the Waitaki District Council, Oamaru

Fig 33: Proposed masterplan for the former railway goods yard in Oamaru

Fig 34: Vehicle movement system

Fig 35: Pedestrian movement system

Fig 36: Green network system

Fig 37: Rail movement system

Fig 38: Maximum indicative built fabric

Fig 39: Important sightlines

Fig 40: Minimum indicative built fabric

Fig 41: Meek's Elevator Building (1887)

Photograph sourced and reproduced with permission from the North Otago Museum archive collection, Oamaru

Fig 42: Meek's Elevator Building (2010)

Fig 43: Aerial photograph of existing Itchen/Tyne/Humber Streets intersection

Sourced from Google Earth

Fig 44: Proposed Itchen/Tyne/Humber Streets intersection

Fig 45: Proposed rear addition to Meek's Elevator Building

Fig 46: Existing approach from Thames Street

Fig 47: Proposed approach from Thames Street

Fig 48: Existing approach from Tyne Street

Fig 49: Proposed approach from Tyne Street

1.0 Introduction

*‘The brownfield site is continuous with the fabric of the city, as the city is likewise continuous with the slum’
(Gans & Weisz 2004).*

This research looks at the changing role of rail facilities within provincial New Zealand cities as economic and technological shifts are seeing widespread changes in the way the New Zealand rail network operates, and are leading to the eminent decline of sections within the network as priorities shift to ensure its long-term survival as a whole.

The aim of this research is to identify and analyze these rail facilities, both redundant and operational, within provincial New Zealand cities with the intention of establishing possible strategies for re-integrating these sites back within the surrounding urban fabric of their respective cities, while retaining links to the cultural and industrial heritage of the sites in terms of the role they played in the birth and development of provincial New Zealand.

As the newly established colony in New Zealand began to grow, rail was seen as a quick and cheap way to open up the country, with the first branch line opened in 1863. Initially, branch lines were used to connect port settlements to the agricultural hinterland and, as the country became industrialised, to mines and quarries. By the late 1870s attention shifted to creating trunk lines that would ‘link the nine far-flung settlements of the colony into one nation’ (Leitch & Stott 1988). As the trunk lines began to form and settlements were connected, rail took over from sea-travel, but the rapidly expanding road network began to outcompete the branch lines and subsequently saw many of them closed. While the North Island trunk line was completed in 1908, the Southern trunk line took until 1945, by

which time road freight transport had become increasingly cheaper, faster and popular, to the point where restrictions were placed on the road freight industry to regulate and protect rails share of the market (Leitch & Stott 1988). The interislander rail ferry linked the two trunk lines from 1962, almost a century after the first lines were laid, and over 80 years since a country-wide network was mooted (Leitch & Stott 1988). By this time the rail network had reached its economic peak in the mid 1950's and was beginning to decline as it suffered financially, with widespread downsizing that continues today. The restrictions on road freight transport were gradually relaxed, until the mid 1980's when they were finally withdrawn (Atkinson 2007). The dominance of road freight over rail in present conditions is self evident when driving the main state highways throughout the country, where truck and trailer units far outnumber the trains passing along the neighboring main trunk line.

A number of reports have been written on the future of New Zealand's rail network, and are summarized in a 2009 report (*The History and Future of Rail in New Zealand*, Heatley 2009) that questions the long-term economic viability of retaining the network in its current form as costs to maintain the ageing network escalate and use dwindles in some areas. It highlights that presently only 30% of the network is carrying 70% of the total freight moved by rail, with the regions comprising the 30%, including Auckland, Waikato, Bay of Plenty, Canterbury and the West Coast, also predicted to be high growth areas for the industry. The report suggests that by closing the remaining 70% of the network, potentially billions of dollars worth of land could be freed up to fund upgrading and maintaining the remaining lines to modern standards. While this would see large sections of both the Northern and Southern trunk lines removed, it is argued that they are not essential to the success of the network, drawing on the fact that rail operated for the best part of a century before the trunk lines were completed. The decline in rail operations to the present point has already seen railway stations, goods yards and associated industrial areas in many rural areas and some smaller centers falling into disuse, and with this potential proposed shift in priorities for the national network it is inevitable that many more will follow.

Within the major cities attention has already been drawn to ex-industrial areas such as Centre Port in Wellington, and Wynyard Quarter and Quay Park in Auckland; however less attention has been given to similar sites within smaller

urban centers. These centers, such as Timaru and Gisbourne, cater for an urban population less than 40,000 as well as supporting their surrounding rural communities by providing amenities, produce marketing and importing/exporting opportunities. Port and rail facilities were instrumental in the early establishment and growth of these towns, both in providing vital links to other centers around the country and further abroad, and as economic and social hubs from which settlements could grow. As the towns have developed, these facilities have generally retained a high profile, with strong links to the town center and waterfront areas, even as their importance and role within society has dwindled. In their current states these underutilized or even empty rail sites are occupying important and useful land while economically and physically providing little return to the city for what they can offer. Alongside this a number of these sites also contain examples of early colonial industrial architecture or important early structures in each towns history which, with architectural interventions, could offer a centerpoint or catalyst for new urban plans. However there is little pressure to develop these central sites when, especially in today's auto-dependant society, an abundance of greenfield land on the city limits is generally only a short trip from the center of town. Alongside this, provincial cities generally lack the population base and finances to justify large flagship office or housing redevelopment schemes that are usually undertaken on similar sites in larger centres, and as almost all of the provincial cities are within a 2-3 hour commute to a main urban centre there is little need for large scale sport or event facilities either.

Following this introduction, the second chapter is a review of existing literature. The basis for much of this research stems from findings through the mapping studies in chapter three. The chapter examines two literatures concerning the two main themes in the aim of this research - integration and industrial heritage - which produces two approaches to re-using the rail sites, before being drawn together and discussed.

The third chapter provides a graphic analysis of the physical environments of rail sites within ten provincial cities throughout New Zealand. Mapping studies are constructed from aerial photography gathered from Google Earth and are examined in layers, including figure ground, rail and street grids, zone designations, public green spaces and land forms. Through comparisons drawn between the maps, common characteristics and issues inherent across all of the rail sites are highlighted, and form an initial set of general criteria for the design case study to address.

The fourth chapter introduces the North Otago town of Oamaru, the location of the selected site for the design case study. A brief history of the site describes its evolution from treacherous anchorage, to bustling harbor, and eventual decline leading to the current situation. This is followed by a discussion of an existing plan for the site, 'Harbourside', which compiles a number of ideas concerning the site that have been submitted to the local council in recent years, and as such offers a unique look into how the local residents view the site, and what features and amenities they consider important. Finally, the general issues and criteria identified and outlined in the previous two chapters are assessed against the Oamaru site analysis to create a set of site-specific criteria that will inform the design case study in the following chapter, and subsequently evaluate it.

The fifth chapter discusses how the issues identified in chapters two & three are addressed in the design case study for the former railway goods yard in Oamaru. The design details an overall masterplan solution for the Oamaru site, before developing an important intersection within the masterplan at an architectural scale, with both stages addressing the site-specific design criteria outlined in the previous chapter.

The final chapter draws together and discusses the main issues and findings identified in this research. Alongside this the Oamaru case study design from the previous chapter is analysed and discussed, in relation to the remaining nine rail sites examined in chapter three, to present general design strategies, criteria and further research paths for the re-development of redundant rail facilities in provincial New Zealand cities.

2.0 Literature Review

This chapter provides a critical review of existing theories and practices relevant to the discussion of the two main themes in this research - integration & connectivity and industrial heritage. This chapter was conducted in unison with a survey of existing rail facilities in provincial New Zealand cities, discussed in the following chapter, and focuses particularly on issues highlighted across the sites relevant to the above two themes.

2.1 Background

By most estimates, the number of brownfield sites is massive - US Government estimates put the number of American brownfields at about half a million, and in Asia and Europe the totals may be just as high. Brownfields are found in both cities and towns, in the rural hinterland and the inner suburbs. Brownfields are suspected to be present on nearly every continent of the globe, with the greatest prevalence in post-industrial zones - places where industry boomed in the 19th & 20th centuries and has since waned (Hollander, Kirkwood & Gold 2010)

Much of the literature written on brownfield and former rail site developments in particular stems from the UK, US and Europe, and focuses on larger urban centers world-wide. Of the smaller cities discussed most cater for an urban population of 250,000 or more, which in the context of New Zealand is comparable to main centers such as Dunedin or Hamilton, which is outside the scope of this study. Where existing studies have covered smaller urban areas that are relevant to the provincial New Zealand city, they are usually suburbs or parts of large metropolitan areas (Burayidi 2001). The situation is best summed up by Jane Jacobs in the introduction of her greatly influential and well-refer-

enced book *The Death and Life of Great American Cities*, where she states:

I hope no reader will try to transfer my observations into guides as to what goes on in towns, or little cities, or in suburbs which are still suburban. Towns, suburbs and even little cities are totally different organisms from great cities (1961).

This is further elaborated on by Kent Robertson, a leader in the field of downtown revitalisation, who isolates some key differences between the downtown areas of large and small urban centers. While these findings are based on his experiences in US towns, the selected points are also relevant in the New Zealand context. Robertson finds that small city downtowns generally;

- have a more human scale, through the lack of tall and imposing buildings, lack of large crowds, and walkable distances between destinations;
- lack the large scale 'signature' developments, including stadiums, indoor shopping centers and convention centers, that are commonplace in larger centers as development anchors;
- are not divided into specific-use districts as larger centers are, where it is common to find separate financial, political, entertainment, shopping and historic districts, each with their own function, character and feel;
- are closely linked and often within walking distance to their neighbouring residential suburbs, which is rare in larger centers because of greater distances and the prevalence of a transition zone between downtowns and residential neighbourhoods that contain light and medium industrial businesses and parking lots amongst others;
- are likely to contain a higher percentage of historic buildings than larger centers, due to less demand for their demolition to make way for new developments in smaller centers (Burayidi 2001).

Alongside these key differences Robertson highlights a small number of common characteristics between the downtown areas of large and small centers which emphasizes that regardless of current size, most cities grew from similar circumstances. The downtown areas in most cities;

- are likely to be situated very close to the historic beginnings of the city, often in proximity to or bordering a body

of water;

- contain most of the historic and important buildings, in terms of both architecture and public use, in the city;
- maintain a strong public identity amongst local residents;
- generally possess greater built densities than other areas (Burayidi 2001)

As highlighted by the mapping studies of rail sites within provincial New Zealand cities in the following chapter, the majority of the ten sites examined are in immediate or close proximity to their respective town centers. With this in mind, recognising and understanding these similarities and differences between the downtown areas of smaller and larger cities will help to extract information that is relevant to the scope of this study from the wider body of existing material concerning brownfield, rail and urban redevelopments.

2.2 Integration & Connectivity

Massive single uses in cities have a quality in common with each other. They form borders, and borders in cities usually make destructive neighbours (Jacobs 1961)

Massive single use borders, such as railway lines, sever areas and create problems with connectivity either side of them (Jacobs 1961, Lynch, 1965). Looking forward to the mapping studies of rail sites in ten provincial New Zealand cities in the following chapter, the predominant recurring issue across all of the sites is a lack of permeability into and across them. (*figure 1*) presents a comparison of connectivity investigations, which highlight the disruption caused to the movement patterns of the surrounding urban fabric in the respective cities. This ranges from severed connections between residential suburbs, to separation of residential areas from the town center, and finally a detachment of the town center from particular destinations, including waterfronts.

Often these borders are thought of as passive objects or simply edges, however a border exerts an active influence (Jacobs 1961, Lynch 1965). While almost all of the literature on brownfields refer to the effects on neighbouring properties from long-term pollution and the stigma effect on property values associated with abandoned and derelict

fig 1: Investigation of connectivity across rail sites in povincial New Zealand cities

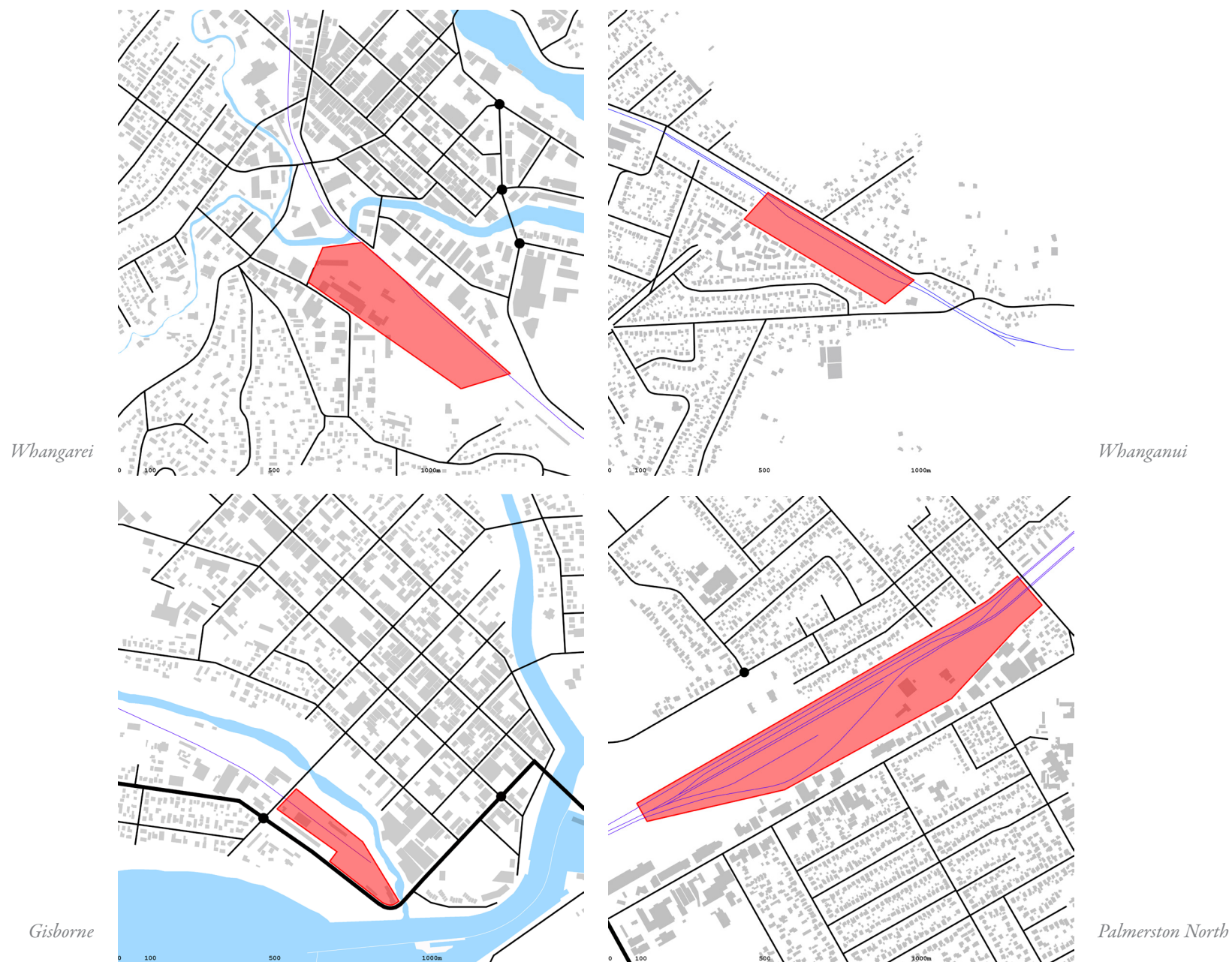
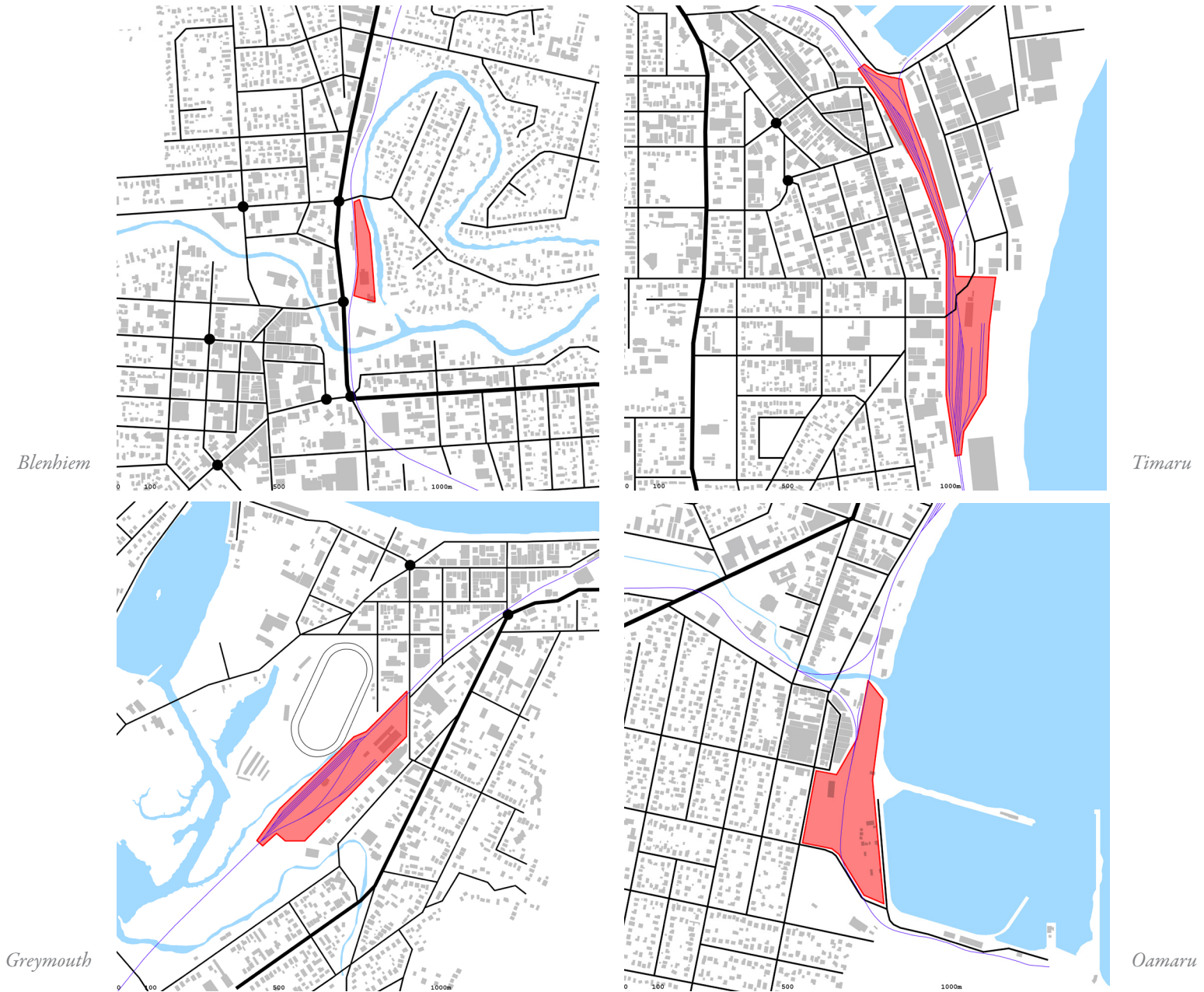


fig 1: Investigation of connectivity across rail sites in provincial New Zealand cities



sites, Jacobs and Lynch in particular discuss this active influence in relation to the issues it creates around connectivity. Jacobs elaborates that

the root trouble with borders as neighbours is that they are apt to form dead-ends for most users of city streets. They represent, for most people most of the time, barriers. Consequently, the street that adjoins a border is a terminus of generalised use. If this street, which is the end of the line for people in the area of the 'ordinary city', also gets little or no use from people inside the single-use border forming territory, it is bound to be a dead-end place, with scant users. The deadness can have further repercussions. Because few people use the immediate border street, the side streets adjoining it are also less used as a result. They fail to get a by-the-way circulation of people (or traffic) going beyond them in the direction of the border, because very few people are going to that beyond (Jacobs, 1961).

whatever lively and diverse growth occurs to either side, it is likely to happen beyond these zones, inward and away from the tracks. The zones of low value and decay which we are apt to find beside the tracks in our cities appear to afflict everything within the zones except the buildings that make direct, practical use of the tracks itself or sidings (Jacobs, 1961).

Wherever there are significant 'dead places' in downtown areas it causes a drop in the intensity of pedestrian traffic and use of the city in and around those areas. Sometimes the drop is so serious economically that it causes business to decline (Jacobs 1961). With the majority of the ten sites examined in the following chapter in close proximity to their respective town centers, this is of particular concern. Exemplary of this is the authors home town of Timaru, where the northern end of the main street is flourishing, with strong pedestrian and vehicle connections passing over a single rail line to Caroline Bay and the port, both prominent local amenities. In contrast, the southern end of the main street is littered with 'dead places' in the form of vacant shops and derelict properties, which can be partially attributed to the number of adjoining streets that are disrupted by, or terminate in the nearby railway goods yard.

The *Urban Design Compendium*, compiled by the British Commission for Architecture and the Built Environment (CABE), is the most concise and up-to-date publication on core urban design principals, presenting a number of accepted models and guidelines around integration and connectivity. It is evident that, in revisiting Robertsons key elements of smaller city downtowns, the provincial cities at the focus of this research already strongly represent many of the positive attributes of current urban design theory and practice. In particular this refers to the human scale of built forms, walkable distances between destinations, and a vibrant and practical mix of building types and uses (Burayidi 2001). The scale of these sites disrupts a large area of movement and as such offers a large scope for new development and connections. It is important to acknowledge these positive attributes and use the opportunity to continue these within the site to enhance the surrounding urban fabric.

Layout is a major influence on how people choose to travel. Over the last 50 years or more the planning of developments has been dictated primarily by the geometry of road design, and this has had the effect of encouraging car use, even for journeys which could have been made on foot or by cycling (Jacobs 1961, Gehl 2010, English Partnerships & Housing Corporation 2007). To reverse this tendency means designing with all forms of movement in mind, not just the geometry of road layouts. What matters is that, wherever possible, movement on foot, by bicycle or public transport should be as easy and convenient as using the car. This doesn't mean excluding the car, what is needed is an appropriate balance between traffic and other users to create attractive, lively, safe and interesting places (Gehl 2010, English Partnerships & Housing Corporation 2007). In addition, legibility is of great importance as people need identifiable objects in order to understand the layout of a place. Lynch suggests five key elements that are required for legibility - nodes, edges, paths, districts and landmarks (Lynch 1965).

The *Urban Design Compendium* outlines the contextual analysis that will provide the basis of a movement framework will need to establish

- how routes from the new site will link with the existing structures;
- the provision made for all forms of movement, with positive discrimination in favour of walking, cycling and public transport;

- how the new development can benefit the area as a whole, for instance by the extension of a major route, or a more direct footpath to the neighbourhood center;
- how movement will be provided for at all stages of the development (English Partnerships & Housing Corporation 2007).

The connections between a site and its surroundings are important even for the smallest of developments. A site that becomes available for development will have existing points of access, but they may not be suitable, or be in a suitable location (Hollander, Kirkwood & Gold 2010, English Partnerships & Housing Corporation 2007). This is particularly true for a number of the rail sites at the focus of the research, where the number and location of existing access points are limited by the layout of the rail lines and sidings in each respective site. However, as these sites become redundant there is opportunity to redefine access points and align them with major thoroughfares to create a more practical basis for an internal movement system (*figure 2*).

Direct, attractive connections between key facilities, avoiding dead ends, help to create more convenient and comfortable places. An assessment of how best a site can plug into the wider movement networks should aim to provide the maximum number of direct connections to main streets carrying through traffic. The more direct the links between main streets, the greater the potential for mixed uses (the links do not have to be vehicular). Decide what links are most important to extend into the scheme to provide the basis for an internal movement structure (English Partnerships & Housing Corporation 2007).

Any new links through these sites will only be useful if people are aware of them, so it is important to incorporate new movement routes as continuations from as many access points as possible outside the site, and make sure they can be seen to be leading to a destination (Bentley, 1985).

Well connected movement networks enhance access and give people a choice of routes, but these networks need to offer people more than just access alone. They must also provide high quality spaces and routes that people find safe



Consider how best the site can be connected with nearby main routes and public transport facilities



The typical cul-de-sac response creates an introverted layout, which fails to integrate with the surroundings



A more pedestrian-friendly approach that integrates with the surrounding community links existing and proposed streets, and provides direct links to bus stops



This street pattern then forms the basis for perimeter blocks, which ensure that buildings contribute positively to the public realm

Key
 Principal routes
 Internal streets
 Bus stop

fig 2: Creating connections within an existing network

and enjoyable to use. Over half of the ten provincial cities examined contain loose networks of green spaces and bodies of water. The majority of rail sites in these cities are in proximity to these networks, as well as maintaining strong connections to waterways and coastlines due to their historic association with the shipping industry. These attributes highlight the opportunity to link these existing green spaces into a more cohesive system through the rail sites, which benefit from the strong external links to other areas around their respective cities.

Open space networks are often more useful for visual amenity, recreational use and wildlife corridors than isolated and unrelated landscape elements. They not only serve to organise larger projects but also create linkages to existing urban areas, other sites and the wider landscape (English Partnerships & Housing Corporation 2007).

Green corridors incorporate pedestrian and cycle paths and typically follow linear elements such as streams, coastlines, wooded belts and even redundant rail lines, with fingers penetrating from surrounding rural areas, through the city edge and into the urban center (English Partnerships & Housing Corporation 2007). Operating within an open space network, these corridors may join up parks, reserves, playing fields and gardens, as well as plugging into streets that contain pedestrian and cycle routes, reduced car traffic and mature trees (Gehl 2010, English Partnerships & Housing Corporation 2007). As a result, they encompass a wide range of characteristics throughout their length. Socially, green corridors have recreational uses, a place to play, gather or rest. They give people a sense of place, of identity and belonging. Environmentally, green corridors provide a high quality of life through integrating nature into the urban environment and stimulating the senses with their simple colour, sound, smell and motions (Brebbia & Carpi 2010).

A successful movement framework provides the maximum choice for how people will make their journeys, takes full account of the kinds of movement a development will generate, and makes clear connections to existing routes and facilities (English Partnerships & Housing Corporation 2007).

We can see that in city after city where conditions for life on foot are improved, the extent of walking activities increases significantly. We also see even more extensive growth in social and recreational activities... More roads invite more traffic, better conditions for cyclists invite more people to ride bikes, but by improving conditions for pedestrians we not only strengthen pedestrian traffic, we also - and most importantly - strengthen city life (Gehl 2010).

2.3 Recognising Industrial Heritage

As outlined in the introduction to this study, rail played a important role in the formative years of New Zealand and its individual settlements. Looking forward to the mapping studies of rail sites in ten provincial New Zealand cities in the following chapter, it is already evident that in two of the redundant sites examined, Rotorua and Whanganui, there are no remaining traces of the former rail activity in or around the sites. The typical age and location of these rail sites within these cities dictates that, alongside the rail elements, there is most likely buildings and/or structures of local historical importance contained within them (Burayidi 2001), and it is important to the context and identity of the city to acknowledge these before further examples are lost. Most of the rail sites examined, both redundant and operational, still contain most of their rail elements in their original setting, which is argued to be an asset as it contains a context for a railroad structure and setting (Riskin 2005). Neil Cossans elaborates on this argument further, stating

The overwhelming importance of the railway, in all its various manifestations, is such that it must form part of the past that we choose to take forward into the future. And what we take forward must be in a sufficient state of completeness and authenticity so that our successors may gain some tangible comprehension of its extraordinary impact on humanity... The material evidence of the railway - its pre-history, history and subsequent development - still survives in profusion. That record is unique and sufficiently complete to represent an outstanding archeological, historical and - perhaps more importantly - cultural asset that we can ill afford to lose (Burnam & Stratton 1997).

To put this quote in context, Cossans is referring to large scale retention and development of entire lines that are of historical importance within the UK, however there is no reason for this argument not to apply at a smaller scale to those rail facilities identified in this study. In a number of small rural settlements around the country, former rail associated buildings and structures have been retained, and in recent years been developed with an eye towards tourism in particular. Pleasant Point, west of Timaru, is one such example where over 2km of rail line has been preserved for a restored steam engine to travel between the original station in the center of town, to a large warehouse on the outskirts that houses memorabilia and function facilities. The popularity of this development has seen most businesses and functions in the small rural town adopt rail orientated themes, giving the area a strong identity. However this doesn't seem to be the case in at least two of the provincial cities examined, potentially due to higher land values giving greater incentives for rail companies to demolish and remove buildings and structures from the site. (Riskin 2005). While some buildings on and around the sites examined are heritage listed, including the Gisborne and Blenheim stations, the Masterton locomotive shed and the former mill structures in Timaru and Oamaru, this doesn't necessarily ensure their survival. In fact has often been hard to see industrial culture as heritage at all, since heritage is most often thought of in terms of relics from a pre-industrial history (Alfrey & Putnam 2005).

In recent decades there has been an expansion of what is considered a heritage resource. The number of buildings, artifacts and landscapes afforded some form of heritage recognition and protection has increased dramatically, and more importantly, diversified in type (Alfrey & Putnam 2005). James Richards argues this is partly because of the cycle of taste, we have only recently become capable of looking dispassionately at the 19th century (Richards 1968). One of the more significant aspects of this expansion is the importance placed on the retention of the contextual setting;

In terms of artifact size, the expansion of recognition has been greater with large objects than with smaller ones. This is because of the discovery that the future of the individual site or monument can not be isolated from that of its environmental context (Fitch 1990).

fig 3: Investigation of rail associated industrial structures in provincial New Zealand cities



fig 3: Investigation of rail associated industrial structures in provincial New Zealand cities



Despite this expansion of thinking, Alfrey & Putnam highlight the prejudices that still remain to an extent in recognising and isolating industrial remains within a setting. Selection based solely, or largely, on architectural qualities may mis-represent industrial histories by identifying ‘exceptional’ rather than ‘typical’ examples (Alfrey & Putnam 2005). It is important, however, to retain these ‘typical’ examples as, at the very least, they are almost always a part of the contextural setting of the ‘exceptional’ (Fitch 1990). Many ‘typical’ industrial buildings may not be recognised because they are too recent, too altered, or have no conventional architectural aesthetic. Emphasis on original condition or visual integrity may not be very relevant for many industrial buildings that have had to be adapted to keep abreast of technological and economic changes as the price of their survival (Alfrey & Putnam 2005). James M. Richards catalogued a number of 19th century industrial structures throughout England, including mills and sheds that are comparable to structures typically found in the rail sites examined in this study (*figure 3*), to emphasise their important qualities. These qualities include their expressive use of materials and their trimness of detail. In fact they display, unobscured by the irrelevance of ornament, the essential attributes of architecture (Richards 1968).

Their lesson for us is in their subtle and infinitely varied use of unselfconscious idiom derived from meeting the challenge of function fairly and squarely (Richards 1968).

In their book *The Industrial Heritage: Managing Resources and Uses* Alfrey and Putnam surveyed a wide range of people involved in heritage developments world-wide to define industrial heritage and what it involves;

- piecing together the remnants of long-lost (or recent) industry to understand how it functioned;
- protecting and caring for old buildings, sites and machinery because of their technical, historical or aesthetic interest;
- finding new uses for redundant but irreplaceable elements of the industrial landscape;
- restoring disused machinery and working practises to use
- recording the knowledge, skills and experience of the industrial populations;
- and using the results of the above to show how past generations lived and worked (2005).

The third and fourth points are of particular interest in this study as a majority of the buildings and structures associated with the rail sites examined are no longer fit or relevant for their original intended purpose. These include stations, goods storage sheds, sidings and platforms, and rail tracks, alongside the mill buildings and port facilities that border some of the sites. While it is possible for these buildings and structures to host a new use or uses with minimal intervention, short of treating them as museum pieces this is rare. Peter Burman argues that with such structures, much more likely is the kind of conversion to a new use that, while respecting the original fabric and character as far as possible, involves a certain or even radical degree of intervention (Burman & Stratton 1997).

Paul Byard, an architect, worked on several high-profile building restorations in New York over the last 30 years, including Carnegie Hall. He did not view heritage as a matter of casting the past unaltered in amber, instead arguing that

every act of preservation is inescapably an act of renewal by the light of a later time, a set of decisions both about what we think something was, what we want it to be and what we want it to say about ourselves today
(Byard 1998).

A number of authors have identified and defined four increasing degrees of intervention for conservation purposes, and the ICOMOS New Zealand charter is one of these sources. ICOMOS (the International Council on Monuments and Sites) is an international organisation of heritage professionals engaged in the conservation of places of cultural heritage value, and the New Zealand charter contains a set of guidelines on cultural heritage conservation that is particular to the country. The four degrees of intervention as outlined in the New Zealand charter consist of;

- Preservation, through stabilisation, maintenance, or repair;
- Restoration, through reassembly, reinstatement, or removal;
- Reconstruction; and
- Adaption (2010).

Of these, the process of adaption is the most flexible and useful to this research. This is further defined in the charter as

Adaption: The conservation of a place of cultural heritage is usually facilitated by it serving a socially, culturally or economically useful purpose. In some cases, alterations and additions may be acceptable where they are essential to continued use, or where they are culturally desirable, or where the conservation of the place cannot otherwise be achieved. Any change, however, should be the minimum necessary and should not detract from the cultural heritage value of the place. Any additions and alterations should be compatible with the original fabric but should be sufficiently distinct that they can be read as new work (2010).

Ames and Wagner acknowledge that designing additions to historic building is perhaps the most challenging activity within the field of historic preservation, to strike a balance between extending the historic fabric seamlessly and differentiating the addition so that it isn't mistaken for the historic building. The refinement of appropriate detailing is also of considerable significance, as such detail or ornament must simultaneously respond to the historic context while fulfilling contemporary requirements and sensibilities (Ames & Wagner 2009).

2.4 Discussion

This chapter discusses two literatures -integration & connectivity and industrial heritage - and has identified two approaches to re-using redundant railway facilities in provincial New Zealand cities.

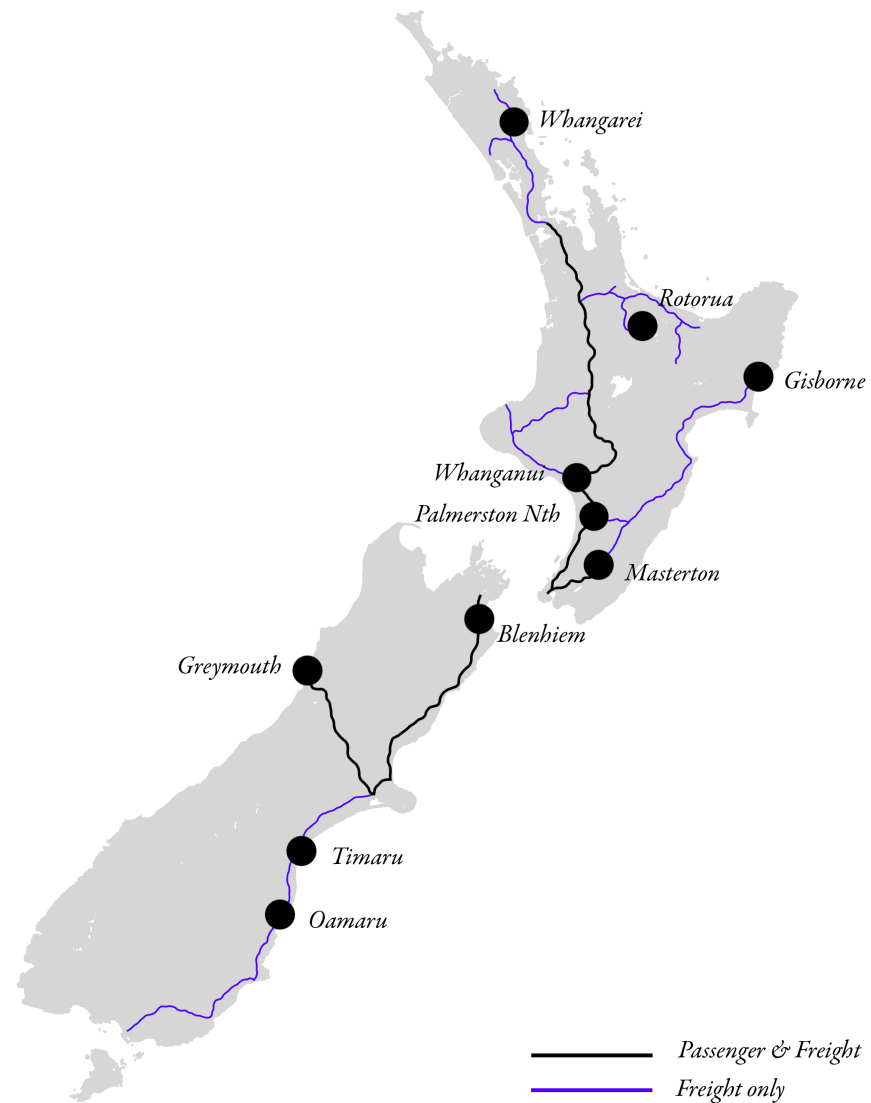
Investigations of connectivity through mapping studies identified the disruption caused by rail sites to the movement patterns of the surrounding urban fabric, with the predominant recurring issue across all of the sites being a lack of permeability into and across them due in particular to the number of rail lines and sidings. Jacobs highlighted the problems these dead-ends causes to the usability of neighbouring streets and spaces. Dissecting the site with direct, clear connections between main streets and destinations either side to create movement across the site provides a basis for new development to grow and improves the quality of and access to areas neighbouring the site.

Investigations into the industrial heritage of the rail sites reiterated their status as important historical and cultural assets, not only due to their part in the establishment and growth of provincial New Zealand but also the impact of rail on mankind. Recent expansions in regards to what is considered a heritage resource have placed emphasis on the importance of retaining the contextual setting of such sites, rather than isolating and retaining individual elements. As a result, it was argued that these rail facilities are important enough to warrant retention as an entire system, in their original setting to provide sufficient state of completeness and authenticity.

These two approaches are seemingly at odds with each other, as retention of a entire rail context within a site, even when redundant, would still affect and restrict connections across the site and severely limit the scope and scale of new development within the site. This would effectively create a situation not dissimilar from the status-quo.

This conflict can be avoided through only selecting and retaining elements that are critical in allowing an understanding of the contextual setting of the site. For instance, it is not necessary to retain the entire system of rail lines and sidings, instead by isolating a main indicative rail line along with two or three sidings as organisational elements a strong physical and visual rail-orientated presence can be maintained in the site. This then reduces, if not eliminates the disruption to connections across the site, and importantly allows more space within the site for new development, allowing a greater opportunity to successfully integrate the site within the surrounding urban framework.

fig 4: Survey Site Locations Map



3.0 Survey of Provincial Railway Land

This chapter provides a graphic analysis of the physical environments of rail sites within ten provincial cities throughout the country. As described earlier the small city within a New Zealand context is catering for an urban population of 60,000 or less as well as supporting their surrounding rural communities by providing major amenities, produce marketing and importing/exporting opportunities. The bulk of urban centers that are within these parameters are represented in the following ten examples. These include Whangarei, Rotorua, Gisborne, Wanganui, Palmerston North, Masterton, Blenheim, Greymouth, Timaru, and Oamaru.

The maps were constructed from aerial photography gathered from Google Earth, and cover a 1.5km block that looks to focus on the site and its proximity to the town center in each example. Within each map various elements, including figure ground, street and rail grids, zone designations, public green spaces and land forms, are isolated to present specific information that helps to construct a greater understanding of each environment, and through comparing the maps, a greater understanding of the nationwide situation. As well as drawing comparisons, each site studied has unique characteristics and present differing opportunities. These have been summarized alongside each map as they appear later in this chapter.

3.1 Figure Ground

Immediately obvious when comparing the maps is the placement of the rail sites within each city, with each situation either centrally located or a satellite site. The majority of the sites examined are within a 10 minute or 400m walking radius to the town centers of their city. Exceptions to this are the sites in Masterton, Wanganui and Palmerston North, referred to as satellites because they are both located further to the outskirts of the city, separated from the

town center by residential suburbs. Most of the centrally located sites lie within close proximity to clusters or belts of large industrial buildings.

Focusing in on the rail sites themselves, buildings are either isolated within the center of the site due to their position between rail lines and sidings, or are bordering the site and remaining in contact with the surrounding built environment. From a pedestrian perspective these two differing configurations can significantly affect how the site is perceived. The former, as found in Masterton and Wanganui, appears more open and accessible, while at the other end of the scale the sites in Timaru and Palmerston North are lined with large industrial buildings that physically and visually block the site off from the surrounding environments. A large number of the buildings in the latter case are either historically or currently associated with rail activities with their main facade opening out to the rail site, effectively looking inward and turning their backs to the city.

It should also be noted that although too small to map at this scale effectively, features such as fences which are common around the edges of these rail sites also significantly affect permeability at a pedestrian scale both visually and physically.

3.2 Street Grid

These maps highlight the vastly different roading systems that shape New Zealand cities. All of the sites studied are typically located within proximity of at least one locally significant road, a necessity to allow heavy traffic sufficient access in and out of the site, however only a small number are immediately adjacent to a state highway. These include the Greymouth, Blenheim, Rotorua and Gisborne examples.

In almost all cases, suburbs surrounding the examined sites appear to suffer from poor connectivity to each other. This ranges from severed connections between residential suburbs, as in Palmerston North, to separation of residential areas from the town center, exemplified by Rotorua, and finally a detachment of the town center from particular destinations, such as the Oamaru waterfront. Contributing to this are safety issues around level crossings between

road and rail, where the least number of crossings possible is desirable to minimize risks. These crossings are almost exclusively placed in areas where the rail is only one track wide, which limits the opportunities, especially within the shunting yards studied, for roading to pass through the site. Only in Timaru, Wanganui and Palmerston North is there a road passing over more than one rail line at a time, with the latter two using an overpass to achieve this. This has essentially created a 'superblock' far out of scale from the rest of the city, with some stretching over a kilometer in length, exemplified in Palmerston North and Timaru.

These rail sites have generally played a formative part in their respective cities, and as a result the streets have grown *around* the site, with only one or two minor side streets leading *into* the sites themselves in most instances.

3.3 Zoning

As expected, these sites are predominantly embedded within industrial use designated zones. The exception to this is the disused shunting yards in Gisborne, which has since been redesignated for inner city residential use. The surrounding environment of each site varies, however comparisons can be drawn between certain examples. The centrally located sites, such as in Timaru and Whangarei, typically border both heavy and light commercial areas, while at the other end of the scale, satellite sites like Masterton and Palmerston North are embedded within primarily residential areas.

The disused shunting yards in Oamaru provide a more diverse palette of surroundings, framed by residential and rural zones to the south and a light commercial zone and historic precinct to the north. The designated historic precinct covers a large area of stone buildings that reflect the wealth in the district of the town's formative years and workability of the local limestone as a building material. This precinct has a strong presence within the former rail area, and consequently any restrictions placed on the built forms may affect how the site can be developed around this zone. The only other example to have a designated heritage precinct within the area examined is Masterton, covering a small residential block identified as having significant historical heritage associated with the age, character and social background of development in the area. Unlike in Oamaru however, this area is re-

moved from the rail site and therefore has no immediate bearing on it, but it is part of a potential corridor between the rail site and the town center which creates an opportunity to raise the profile of this area within the town.

3.4 Green Spaces

The significant amount of space required for the shunting yards are immediately obvious when compared to other areas of open reserves. However the perceived size of the sites can differ depending on the nature of the neighboring or nearby open land. Where the sites in Timaru, Oamaru and Palmerston North appear dominant, similar sized sites in Masterton, Rotorua and Greymouth are dwarfed by the park areas and rural land that surround them.

There is some evidence of existing networks between the green spaces and waterways within some examples. Blenheim features the strongest system, with the river that winds its way through the town providing a walkable and cyclable path that adjoins green spaces along its length to link these areas together, including the rail site. A similar system operates through parts of Oamaru, with the central creek running through a rural land reserve, the botanical gardens, the central city, and finally meeting the sea at the edge of the rail site. In this case the site provides an opportunity to link this system to the forestry plantation and quarry area to the South. In the same manner the site in Greymouth has potential to allow for physical links between the wetlands and inner-harbor beyond with the forestland to the East. The remaining examples contain seemingly isolated pockets of open space and parkland that service each of the various suburbs without adhering to an overall system.

3.5 Land Forms

To maintain consistency throughout the sites examined, the topographical representation is limited to 20m intervals. While this limits the level of detail, particularly in the Timaru example, the images still provide a useful understanding of the position of the rail sites in relation to significant surrounding land forms. Again, as expected, the topography of the sites examined is typically flat, which is dictated by the program of the shunting yard. Some of the sites are, however, restricted in size and suffer limited access due to surrounding land forms including hills, coastline and streams. Exemplary of these are Timaru and Oamaru, both adjoining areas of cliffs and steep land that require unique

responses to land use and access compared to other sites.

The rolling terrain in Timaru dictated the need to reclaim land to create an appropriate flat area for rail services to effectively service the port. The main rail lines themselves follow a path along the original foreshore, separated from the city by cliffs along much of their length. While the change in height is less than the 20m contours used in this study, the street grid map illustrates how the road structure is hampered by these cliffs, with very little connectivity between the city and port systems. The drop in height between the city and port lands gives an 'out of sight, out of mind' feel to the area, with much of the rail site out of view along major view shafts in the central city.

Oamaru features a similar rolling terrain, and the large historic quarry site at the south-east edge of the harbor indicates some reclamation has been necessary to create the current topography of the harbor and former shunting yards. Areas of the surrounding terrain slope upwards significantly, particularly the large hill to the south of the site which restricts access to and from the quarry area, the penguin colony popular with tourists, and the Oamaru Yacht and Power Boat Club popular with the locals, to just one road. In contrast to the Timaru example, the site in Oamaru has a high profile with many of the suburbs on the surrounding hills overlooking the coastline and port.

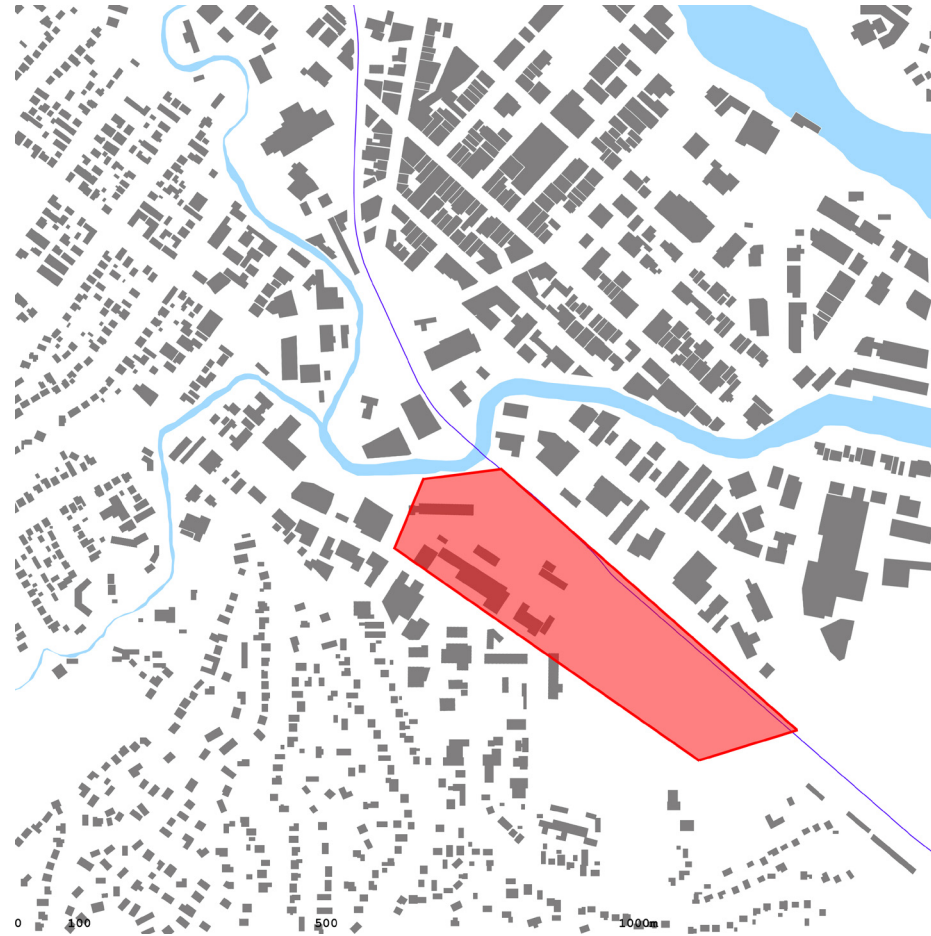
3.6 Discussion

From this graphic analysis of rail sites within ten provincial cities throughout the country, several common qualities and issues have been identified.

- Most of the sites examined form 'superblocks' which need to be dissected to a scale that relates to the surrounding streets and movement patterns within each particular urban setting, to greatly improve connectivity between areas either side of the sites. In almost all cases, suburbs surrounding the examined sites appear to suffer from poor connectivity to each other. This ranges from severed connections between residential suburbs, as in Palmerston North, to separation of residential areas from the central city, exemplified by Rotorua, and finally a detachment of the central city from particular destinations, such as the waterfront and the penguin colony in Oamaru harbour.

- Buildings are either isolated within the center of the site due to their position between rail lines and sidings, or are bordering the site and remaining in contact with the surrounding built environment. From a pedestrian perspective these two differing configurations can significantly affect how the site is perceived.
- Over half the sites are in close proximity to loose networks of green spaces and waterways. In these situations the site provides an opportunity to link these existing public spaces in to a more cohesive system, which also benefits the sites by providing strong external links to other important areas around the city, including waterfronts and town centers.
- Due to the nature of industrial zoning (ie), a revision of zone designations in these areas will most likely be necessary for future development to take place. The use of zones could potentially inform the desired direction a development may follow, or could be implemented on a case-by-case basis as the development progresses over time, to allow for greater diversity and allow for unexpected needs as they arise. The latter is particularly important, as these developments will be taking place over long periods of time and priorities may change.

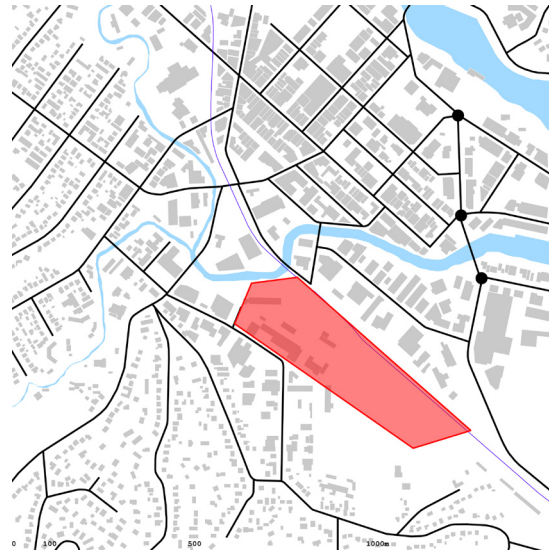
fig 5: Figure Ground Plan Whangarei



Whangarei

- *The rail track through Whangarei is part of the northern main trunk line that terminates a short distance away in Paihia.*
- *The roading system consists of a regular orthogonal grid organizing the central city, while the outer suburbs are less rigid and appear to have grown from what were once rural arterial roads.*
- *The site lies within an industrial zone, bordered by heavy commercial enterprises.*
- *The site cuts off much of the southern suburbs from the town center.*

fig 6: Additional Graphic Analysis Whangarei

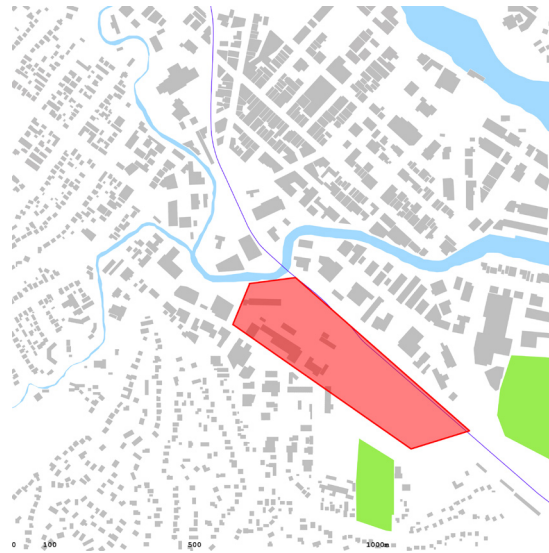


Street Grid

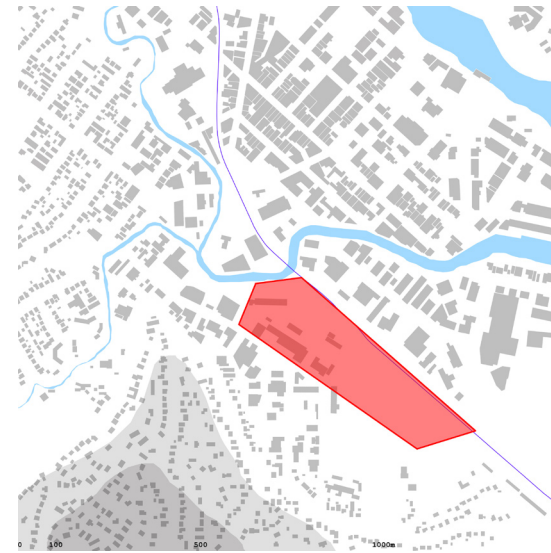


- Residential
- Commercial
- Industrial

Zone Designations



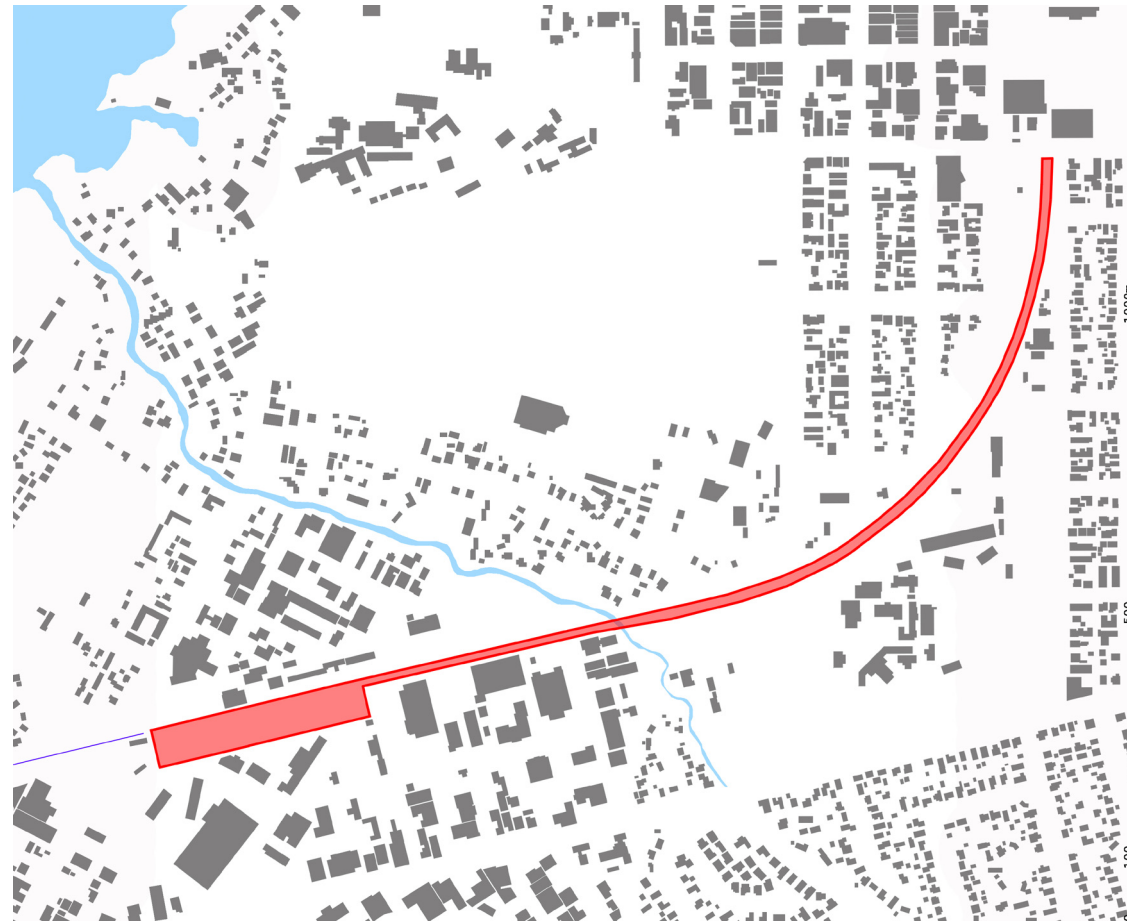
Public Green Spaces



- Low
-
-
-
- High

Topography (10m contours)

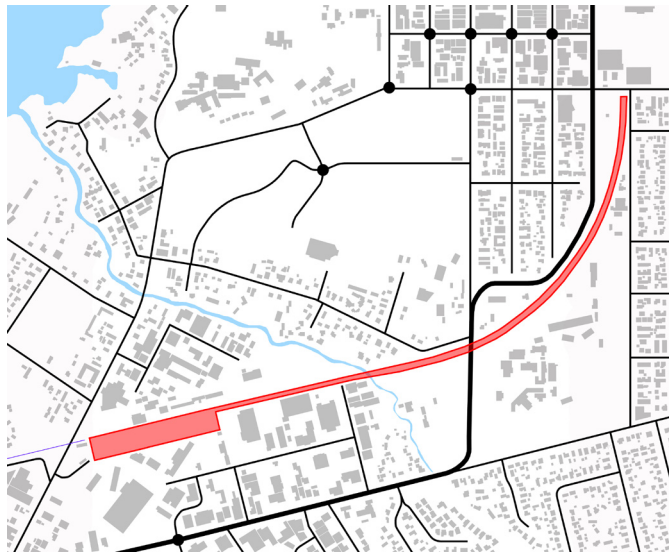
fig 7: Figure Ground Plan Rotorua



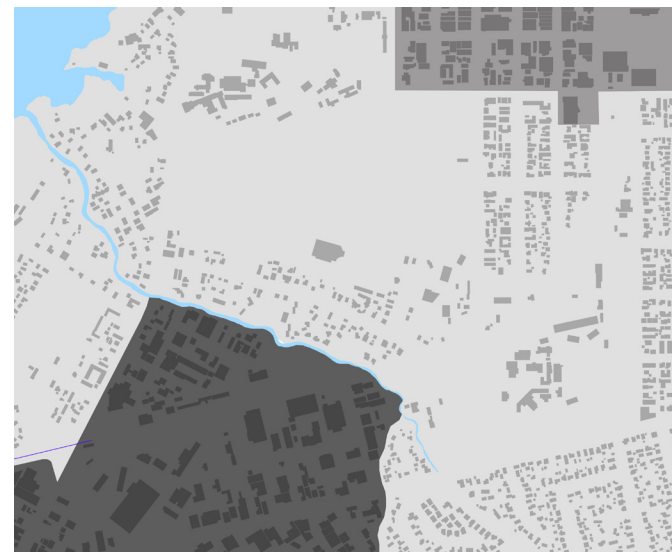
Rotorua (rotated 90° CCW)

- The rail track into Rotorua is the termination of a branch line that passes through Tauranga, connecting to the northern main trunk line through Hamilton.
- While the rail line from the former shunting yard onwards has been cleared, the disused land still creates a barrier between a large residential area to the south-west and the Central Business District/Botanical Gardens.
- The former shunting yard site is imbedded in an industrial use zone, while the remainder of the rail land passes through residential land.
- Areas of the site are either neighbouring or nearby State Highway 5.
- The stream passing through the site provides a physical link to Lake Rotorua, a major amenity of the city.

fig 8: Additional Graphic Analysis Rotorua

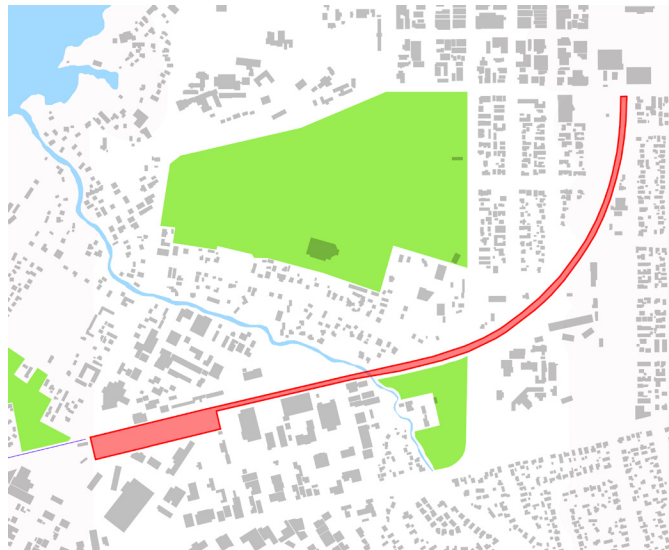


Street Grid

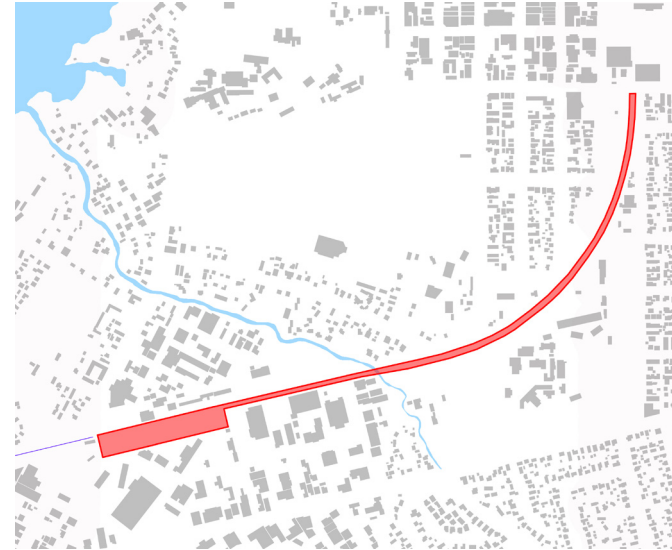


Zone Designations

- Residential
- Commercial
- Industrial



Public Green Spaces



Topography (10m contours)

- Low
- High

fig 9: Figure Ground Plan Gisborne



Gisborne

- *The rail track into Gisborne is the termination of a branch line that runs through Napier and Hastings, connecting to the northern main trunk line through Wellington and Palmerston North.*
- *The roading system consists of a regular orthogonal grid organizing the surrounding central city area.*
- *Most of the rail line in the former shunting yard has been cleared, leaving a large area currently unoccupied.*
- *The former shunting yard site has been re-zoned as Inner City Residential, and is the only example within the cities studied to have been re-zoned.*
- *The site has potential to allow improved links from the town center through to Waikanae Beach, an important local amenity.*

fig 10: Additional Graphic Analysis Gisborne



Street Grid



- Residential
- Commercial
- Industrial

Zone Designations



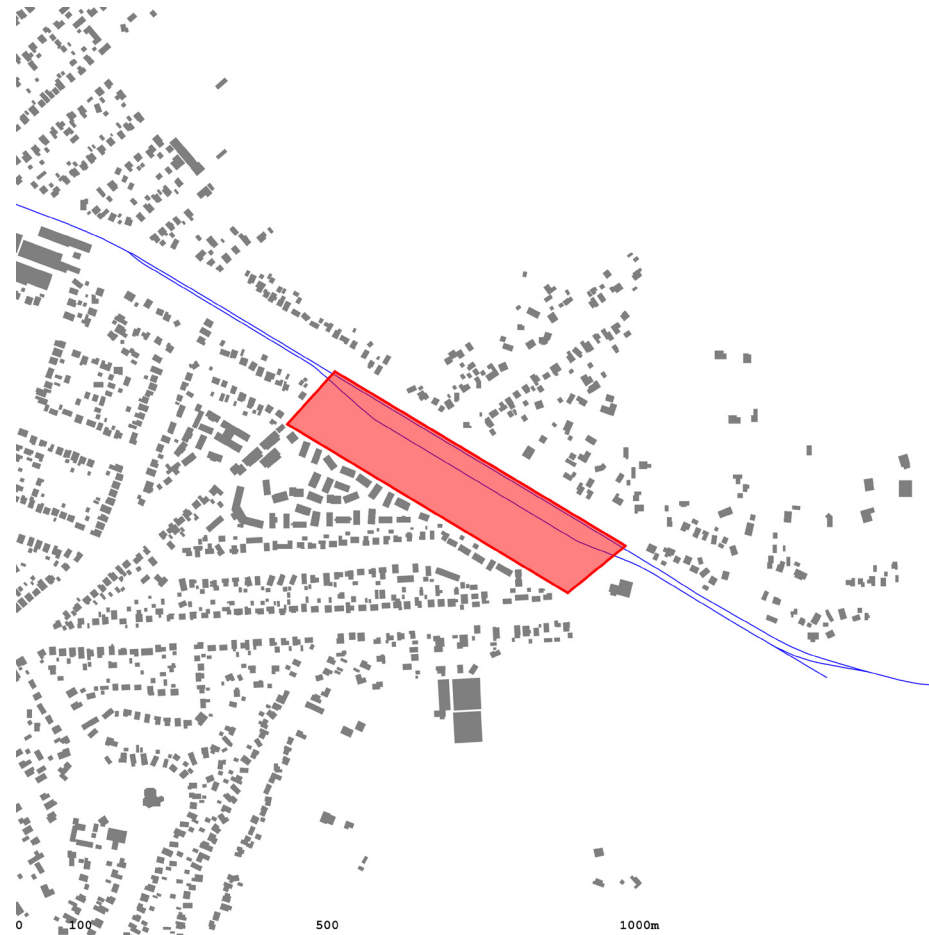
Public Green Spaces



- Low
-
-
-
- High

Topography (10m contours)

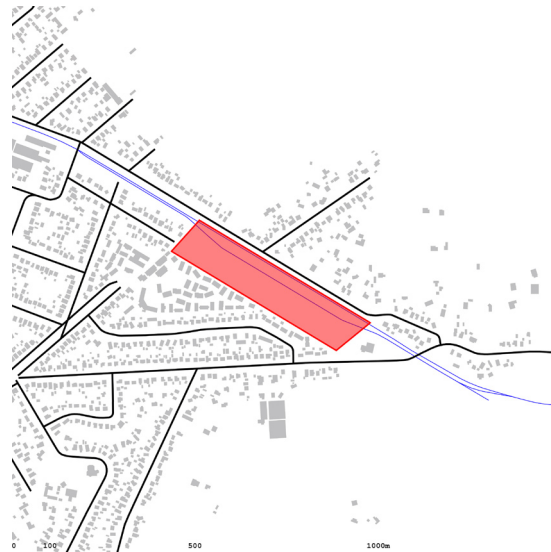
fig 11: Figure Ground Plan Whanganui



Whanganui

- *The site lies within a residential zone on the edge of the city, surrounded by a large area of rural land.*
- *The site itself is roughly 2.7km in a straight line from the CBD to the south-west, or 3.2km when taking into account the need to cross the river.*
- *The roading system has no structured grid and appears to have grown from what were once rural arterial roads.*

fig 12: Additional Graphic Analysis Whanganui

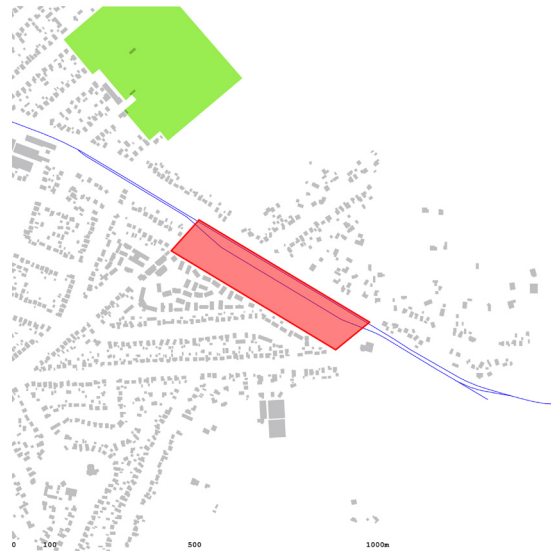


Street Grid

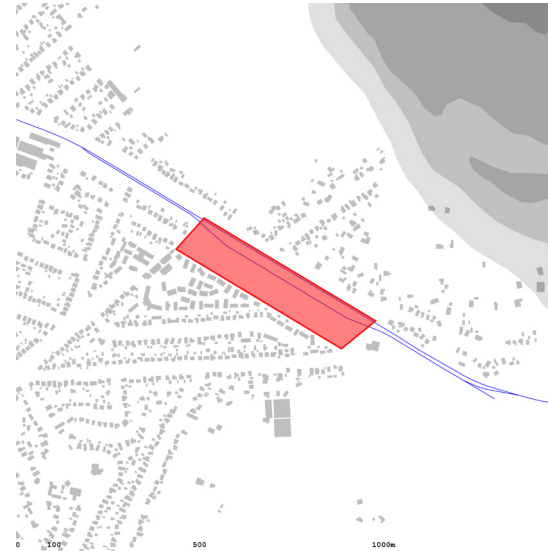


Zone Designations

- Rural
- Residential
- Commercial
- Industrial



Public Green Spaces



Topography (10m contours)

- Low
- Medium
- High

fig 13: Figure Ground Plan Palmerston North



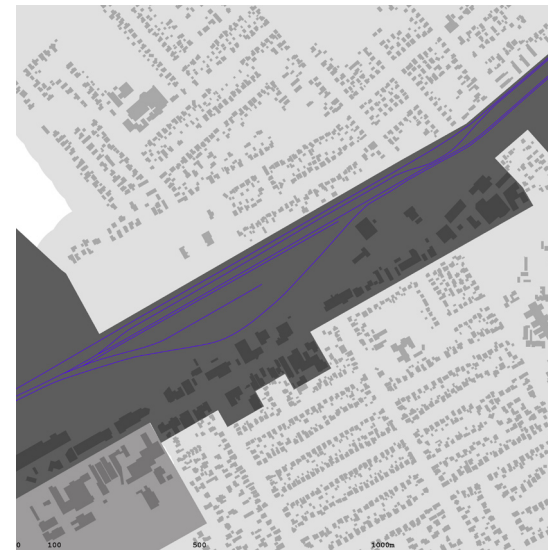
Palmerston North

- *The site itself is roughly 2km in a straight line from the town center, which lies to the south-east.*
- *The roading system consists of a regular orthogonal grid.*
- *The rail line follows an industrial belt, which splits two residential suburbs.*
- *The size of the shunting yards, along with safety issues around level crossings dictate only two roads linking the two suburbs at either end of the yard, creating a 'superblock' 1.5km in length.*

fig 14: Additional Graphic Analysis Palmerston North

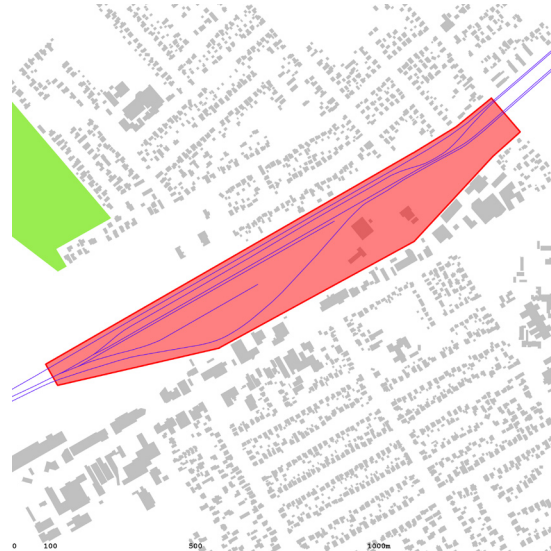


Street Grid



Zone Designations

- Residential
- Commercial
- Industrial



Public Green Spaces



Topography (10m contours)

- Low
-
-
-
- High

fig 15: Figure Ground Plan Masterton



Masterton

- *The rail track through Masterton is part of the branch line that leads through to Gisborne from Wellington.*
- *The site itself is a satellite site at the edge of town and lies roughly 1km in a straight line from the town center.*
- *The roading system consists of a regular orthogonal grid organizing the central city, while the outer suburbs are less rigid and appear to have grown from what were once rural arterial roads.*
- *The historic precinct covers a small residential block, identified in the district plan as having 'significant heritage associated with the age, character and social background of development in the area.' This area is not directly associated with the rail site, but is part of a potential corridor between it and the town center.*
- *One edge of the site separates industrial and residential zoned areas, while the other borders rural land at the town edge.*

fig 16: Additional Graphic Analysis Masterton

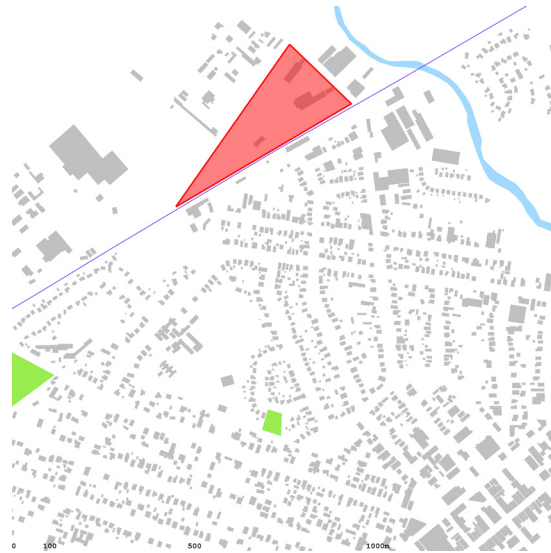


Street Grid



Zone Designations

- Rural
- Residential
- Commercial
- Industrial
- Historic



Public Green Spaces



Topography (10m contours)

- Low
- High

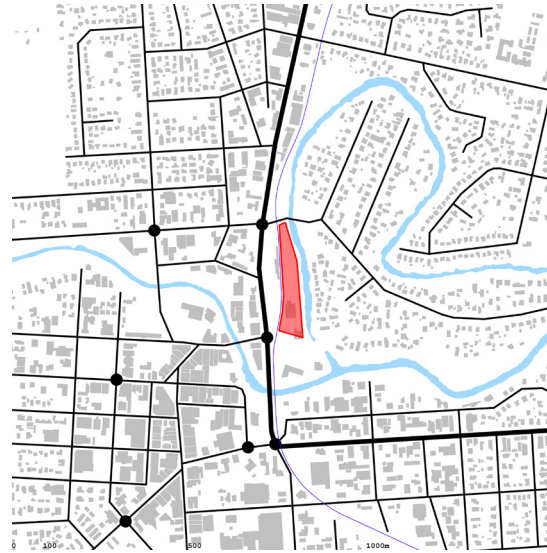
fig17: Figure Ground Plan Blenheim



Blenheim

- *The rail track through Blenheim sees both freight and passenger traffic from Picton through the southern main trunk line to the lower regions of the South Island.*
- *The rail line follows an industrial belt through the center of the city, alongside State Highway 1.*
- *The rail lines in the former shunting yard area have been cleared, leaving a large area beside the main trunk line currently unoccupied.*
- *The local district plan outlines a potential State Highway 1 realignment that would pass through the site.*
- *The site has potential to allow for improved links between the town center and the eastern suburbs.*

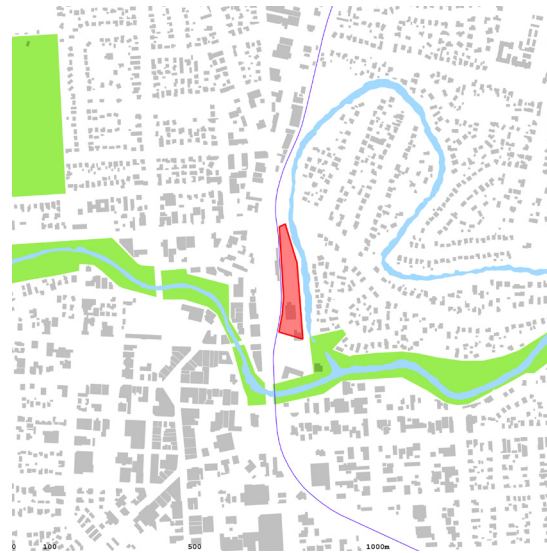
fig 18: Additional Graphic Analysis Blenheim



Street Grid



Zone Designations

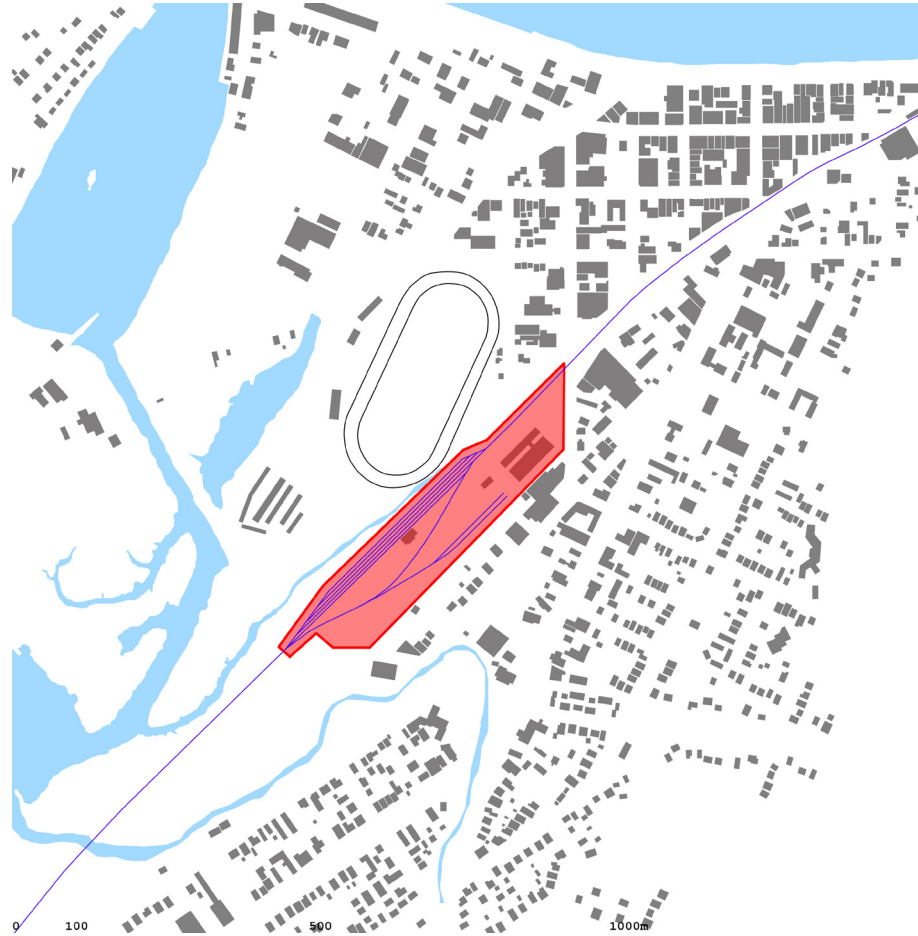


Public Green Spaces



Topography (10m contours)

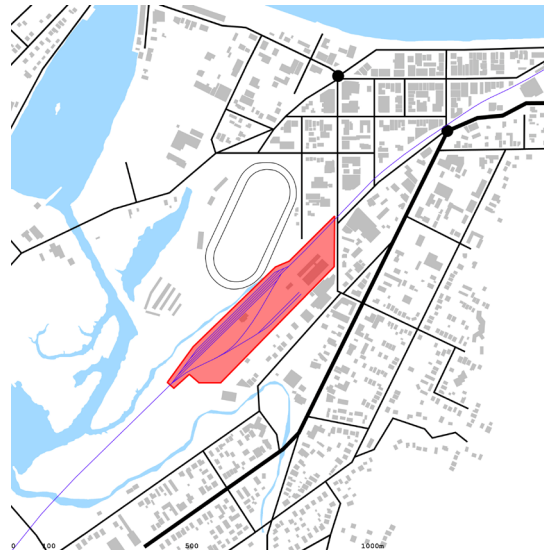
fig 19: Figure Ground Plan Greymouth



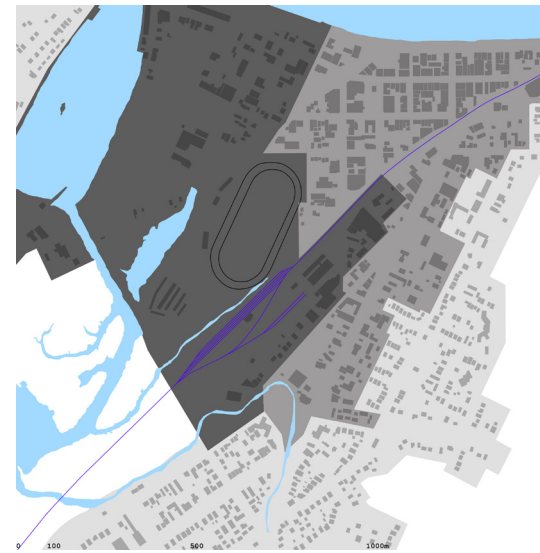
Greymouth

- *This particular rail track is part of a branch line that carries freight and passenger traffic from the southern main trunk line in Christchurch across the width of the south island to Greymouth.*
- *The site lies within an industrial zone, adjacent to a large area of rural wetlands and the local horse racing track.*
- *The site has potential to allow for improved links between the town center and the wetlands.*

fig 20: Additional Graphic Analysis Greymouth

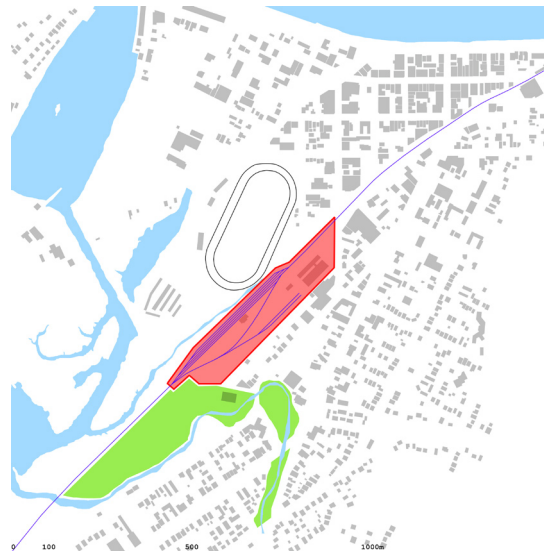


Street Grid

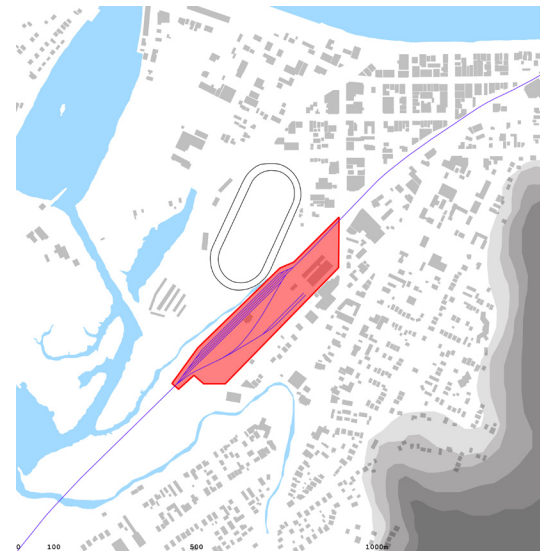


Zone Designations

- Reserve
- Residential
- Commercial
- Industrial



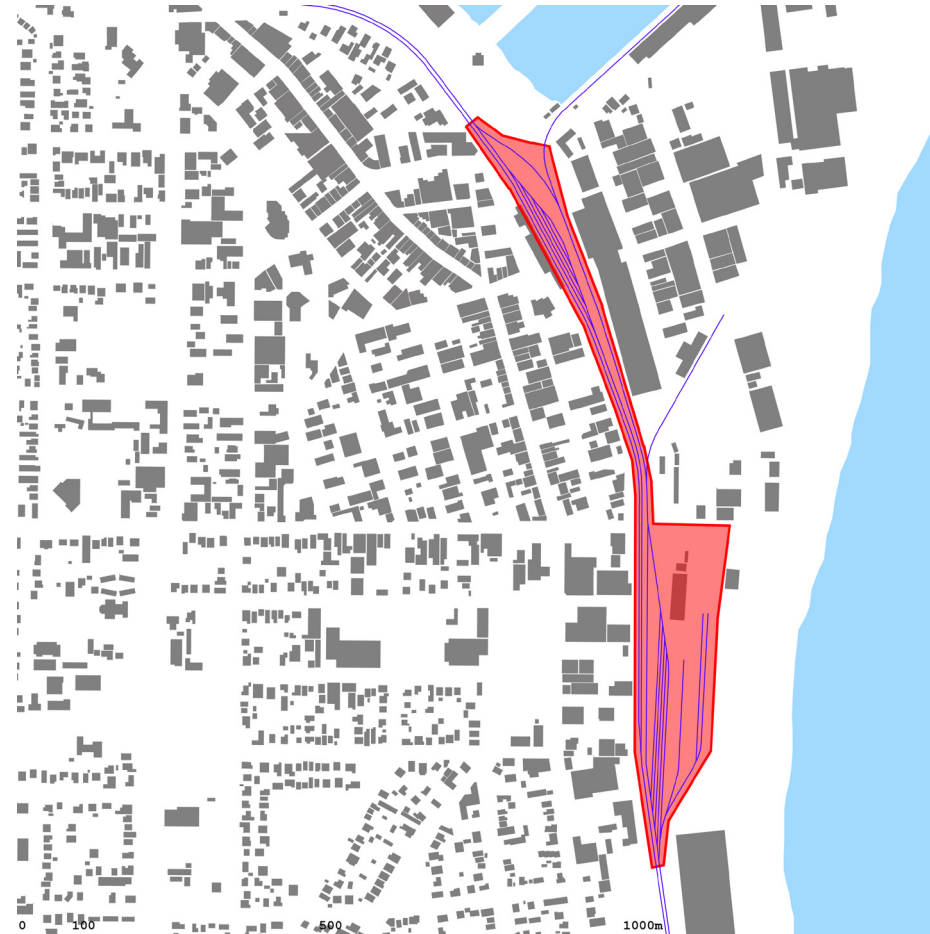
Public Green Spaces



Topography (10m contours)

- Low
- High

fig 21: Figure Ground Plan Timaru



Timaru

- *The rail track through Timaru is part of the southern main trunk line.*
- *The site is in close proximity to the city centre, a result of the combined rail and port activities role in the early development of the city.*
- *The rail line follows the original foreshore line, with the majority of port land reclaimed. As a result, the port land lies at sea level, below the rest of the town. Cliffs along the city-side of the rail line restrict interaction between the two areas.*
- *The roading system of the town follows a regular orthogonal grid, while the port area operates on its own separate grid. The effect the cliffs have on access between the town and port can be seen in the road structure along the edge of the rail lines.*
- *The distribution of historic buildings, predominantly consisting of large milling structures, follows the original foreshore and rail line. The scale of the buildings presents an imposing edge to the site.*

fig 22: Additional Graphic Analysis Timaru

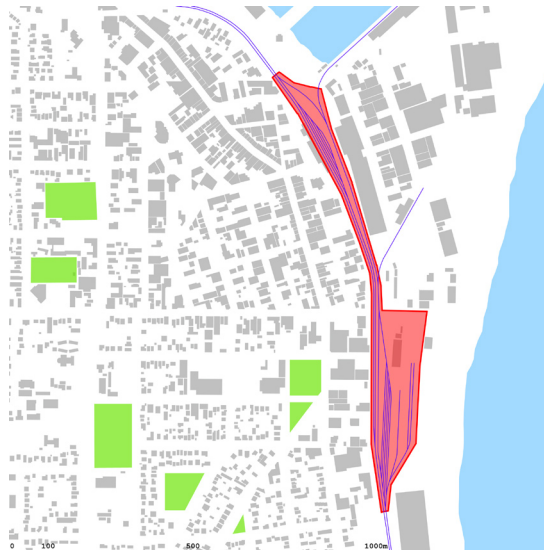


Street Grid

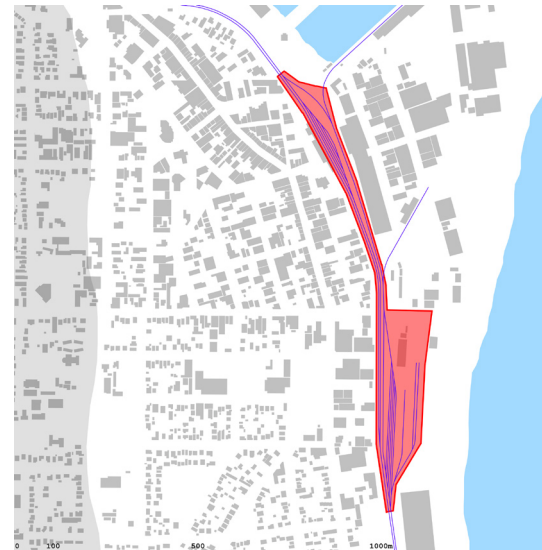


- Residential
- Commercial
- Industrial

Zone Designations



Public Green Spaces



- Low
-
-
-
- High

Topography (10m contours)

fig 23: Figure Ground Plan Oamaru



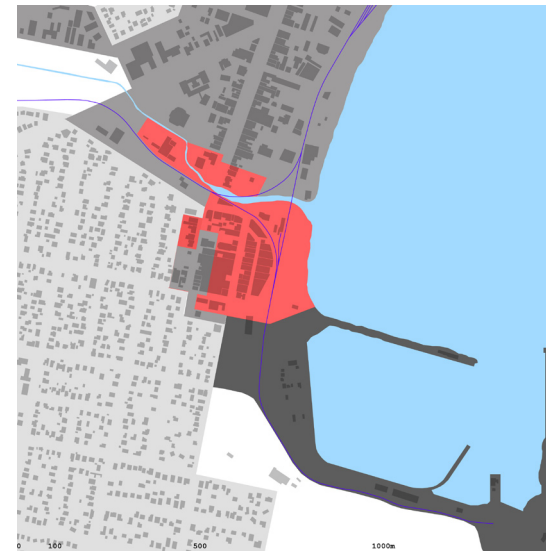
Oamaru

- The rail track through Oamaru is part of the southern main trunk line.
- The original port shunting yards to the south have been cleared, leaving a large unoccupied space currently underutilized as vehicle parking and storage.
- The site is in close proximity to the town centre, a result of the combined rail and port activities role in the early development of the city, splitting the main street from the waterfront port and beach areas.
- Oamaru is well known for its white stone buildings, with most remaining examples refurbished and celebrated throughout the town, however the block adjacent to the site contains some equally impressive examples that remain relatively untouched and in need of attention.

fig 24: Additional Graphic Analysis Oamaru



Street Grid



Zone Designations

- Reserve*
- Residential*
- Commercial*
- Industrial*
- Historic*



Public Green Spaces



Topography (10m contours)

- Low*
- High*

fig 25: Oamaru Harbour (1870)



4.0 Oamaru Case Study - Background & Briefing

From the sites examined, Oamaru has been chosen to investigate further and develop as a design case study. This is due to a number of reasons. The Oamaru site encompasses the common issues identified throughout the mapping studies in the previous chapter, while also presenting unique issues such as access around the site due to topographical limitations. As the author is from Timaru, Oamaru is easily accessible for frequent field visits, and was chosen over Timaru because it is one of only three (the others being Rotorua and Gisborne) redundant sites that are no longer in use for rail activity. The palette of local and tourist based amenities surrounding the site, including the local beach, historic precinct & port and the penguin colony, provide plenty of design scope. Lastly, there is an existing development plan to transform the site in to a mixed use area, known as 'Harbourside'. This plan compiles a number of ideas concerning the site that have been submitted to the local council in recent years, and as such offers a unique look into how the local residents view the site, and what features and amenities they consider important.

This chapter begins by outlining a brief history of the site and the wider Oamaru context. There is little recorded information on the development of the rail goods yard site itself; however there is some documentation of the history of the adjacent port, which allows an insight to the boom and bust of the rail activity in the area. Alongside this a series of photographs highlight periods in the development of the area, illustrating the changing size and quality of facilities and visiting ships, which are all useful indicators of the growing prosperity of the site through to its peak. Following this the existing 'Harbourside' development plan will be assessed and discussed. Finally, the issues and criteria identified and outlined in the previous two chapters are assessed against the Oamaru site analysis to create a set of site-specific criteria that will inform the design case study in the following chapter, and subsequently evaluate it.

fig 26: Oamaru Harbour (1879)



4.1 History of the Oamaru Harbour

Colonial New Zealand depended on sea transport. Every major or aspiring center had to have a port. At different times, and with a different cast of characters, similar stories were acted out throughout New Zealand (McLean 2008)

The early source of wealth in the area stemmed from the Otago gold rush, which allowed the young settlement to begin to flourish. However it was the prosperity of the fast-developing agricultural sector that saw the town rapidly grow and provided the stimulus for what would become a thriving commercial port and harbor area (McLean 2002). Initially though, Oamaru was no port. In the absence of breakwaters or wharves, ships had to anchor out at sea, with cargo transferred to and from land by surfboards. The exposed beach and coastline made it one of the country's most dangerous anchorages, and until the completion of an initial breakwater in the mid 1870's, Oamaru was notorious for the number of ships wrecked or damaged while there (McLean 2008). With virtually all people and cargo transported by sea at the time, local merchants recognized that a safer port arrangement was vital to the success of the town. Retaining the status quo meant rising ship insurance costs that would have driven trade to other ports, leaving Oamaru to fall behind rival towns (McLean 2008).

As a result, the Oamaru Harbourboard was established in 1874, and within the following decade completed the breakwater and constructed a number of wharves, notably Sumpter Wharf which opened the port up to the frozen meat trade, with ships running direct from Oamaru to London. A freezing works opened up to the North of the port and the railway goods yard began expanding to handle the increasing trade (McLean 2008). The huge costs involved in constructing the port to this point almost bankrupted the Harbourboard at the turn of the century; however a boom in trade and local farming produce created the much needed funds for the construction of Holmes Wharf in 1907, which enabled the port to continue handling the newer and larger British ships. Tonnage coming into the port continued to grow over the following decades, and in the late 1930's the Harbourboard began working on an extension to the breakwater to deepen the entrance channel, again to accommodate the growing size of overseas ships (McLean 2008). However, midway through the second world war the British ships ceased trading with Oamaru, de-

fig 27: Oamaru Harbour (1962)



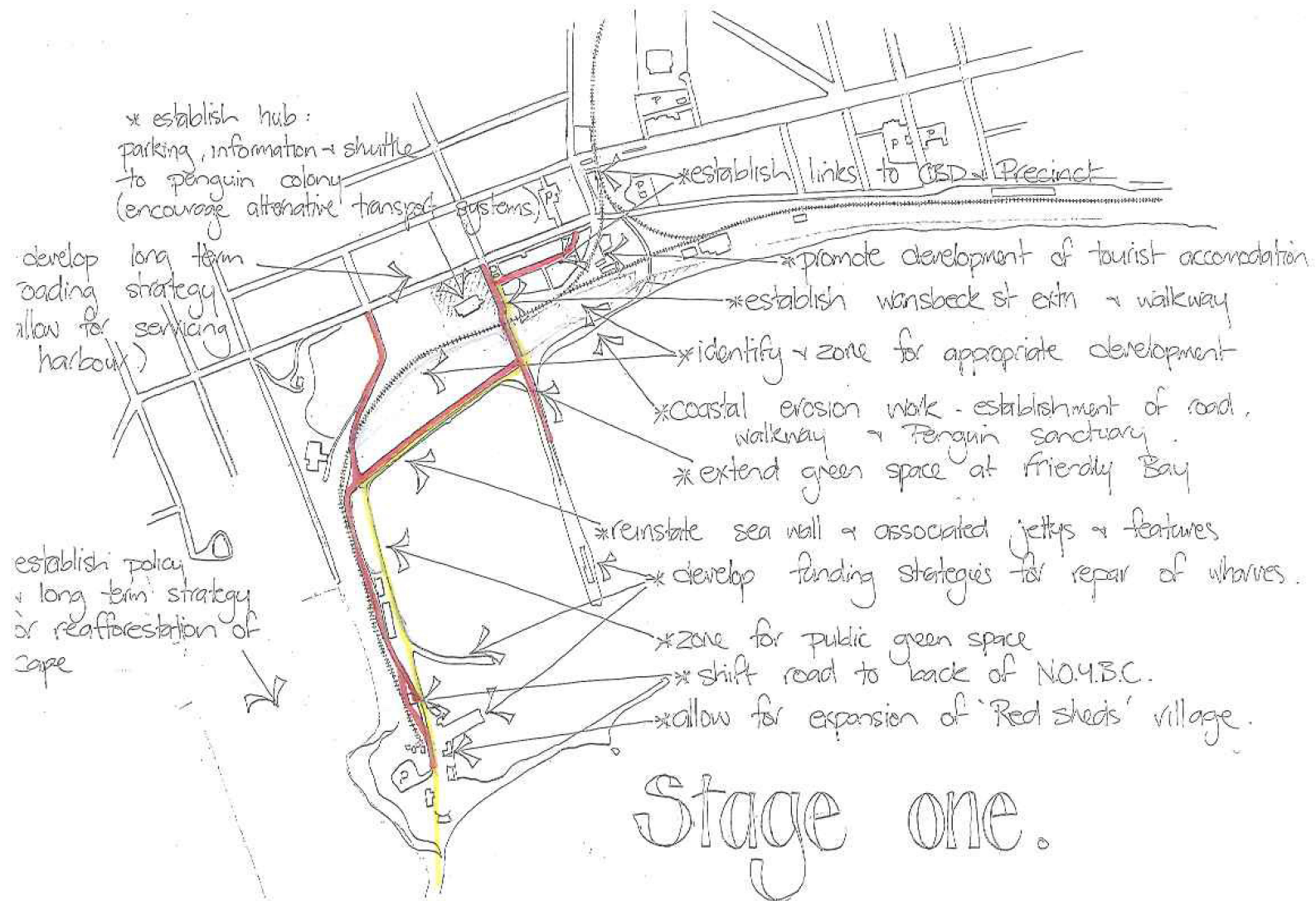
scribed as a temporary wartime economic measure, although the overseas ships never returned after 1945 and the port then relied solely on trans-Tasman and coastal shipping (McLean 2008). Despite this, the port continued to flourish, handling oil, lime, grain, flour and general cargo.

As the 1960's drew to a close the Cook Strait rail ferries opened, connecting the Northern and Southern main trunk lines and offering a faster and cheaper freight alternative for businesses which, alongside major changes in shipping, bought about the demise of commercial activity in Oamaru. The harbor would have needed further expansion and dredging to accommodate these new larger oil and container ships, and the Oamaru Harbor Board decided not to gamble on spending money to recapture diminishing trade (McLean 2008). As the last of the conventional ships left Oamaru in 1974, the Harbor Board celebrated its centenary, and was dissolved a few years later, with the port facilities sold on to the Waitaki District Council. In the years since commercial activity ceased, the harbor has been solely used by small fishing vessels, private boats and rowers. New Zealand Railways began down-sizing the railway goods yard that serviced the port, eventually shifting it north, adjacent to the current railway station where it remains today.

Presently the railway goods yard site in particular gives away little of the previous activity that occurred over the years. Most noticeably absent from the 1962 photograph (*figure 27*) are the majority of the rail sidings that have been removed as the use for them declined and the goods yard relocated, as well as almost all of the locomotive and storage sheds. All that remains are three distinct rail sidings, a modified government issue goods storage shed, and an early footbridge constructed of timber and rail-line iron that crosses one of the sidings.

In recent years Oamaru has become an increasingly popular destination for tourists, due particularly to the revitalization of the historic precinct, and the introduction of Victorian themed attractions that celebrate the early prosperity of the town. In 2007 the Waitaki District Council bought the former rail yard area and rail lines after almost 20 years of negotiations with New Zealand Railways. The council wanted to use the land, a vital link between the historic precinct, the harbor and King George Park, as part of the Harbourside redevelopment project.

fig 28: 'Harbourside' Stage One Plan drawing



4.2 Harbourside Case Study

Of the mapped examples in the previous chapter, only Oamaru has a current design plan for its former rail and port areas. Drawn up in 2008 by Nelson born Oamaru artist Dugal Armour, who runs his own gallery and studio locally, the plan compiles ten years of reports and submissions to the local district council regarding the site. The plan places strong emphasis on retaining much of the open areas within the site, and goes into intricate detail in matters concerning landscaping and planting. As a result descriptions and proposals for the existing and new built forms within the site are lacking the same level of detail. This is most likely due to Armour's landscaping and sculpture background, including smaller-scale works in the Oamaru Botanical Gardens.

The Harbourside proposal aims 'to allow for the current and future needs of the community, while preserving and enhancing the unique historic, spiritual and ecological integrity of the area.' Implementation of the plan is considered to be a 10-15 year project, and has been divided into three stages accordingly.

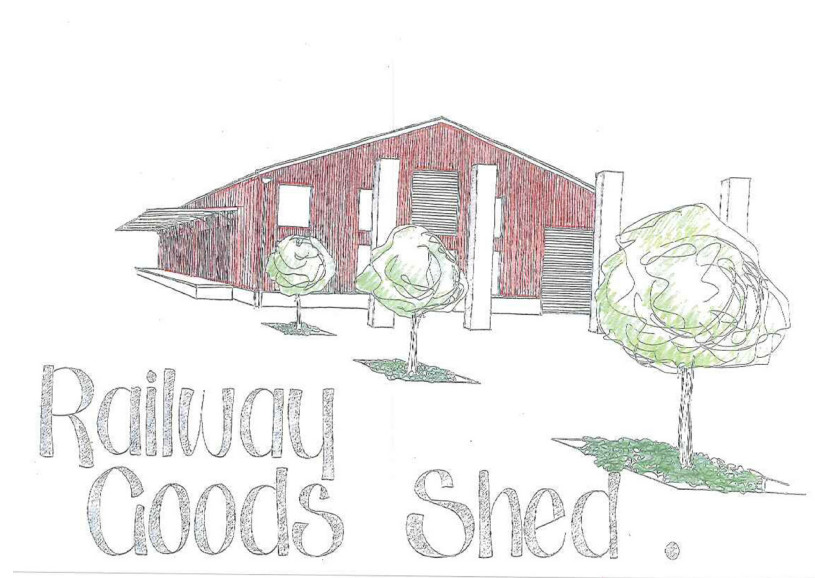
The proposal rightfully highlights the uniqueness of both the harbour and historic precinct settings and their importance within the town from historic, economic and recreational points of view. Alongside this, a number of features in these areas are identified as having particular qualities that create potential areas of focus for a new urban plan. These include;

- Friendly Bay; the only recreational swimming beach in the immediate Oamaru area.
- Marine Parade; a source of important waterfront edge access around the harbour.
- Clay Cliffs and the Quarry; significant landscape features that shape the southern end of the site.
- Penguin Colony; the biggest drawcard to the area, the colony has been instrumental with initial developments and adds a unique ecological theme to the harbour.
- Rail Sidings; the remaining rail lines on the site are identified as key elements to understanding the prior configuration of the area.

fig 29: Existing railway goods shed (2010)



fig 30: 'Harbourside' railway goods shed drawing



One of the biggest proposed changes to the site sees roughly half the former shunting yard area designated as parkland, to facilitate an extension of King George Park to the north, with the intention of eventually closing off Arun Street to join the two park areas. This is an interesting decision, as Arun Street provides a primary thoroughfare around the southern edge of the site for the Oamaru Yacht and Power Boat Club members as well as tourist buses destined for the Penguin Colony. It would seem more beneficial to retain this access route to cater for these regular users, keeping the larger trailer and bus traffic moving around the site rather than through the middle of it. Another issue that arises from this decision is the dead edge presented on Tyne Street by incorporating the park. This effectively creates a situation not too dissimilar from the existing plight. It would be desirable to have a majority of this edge lined with built forms, creating a strong presence for the new development while also providing continuity along the street edge with the neighbouring historic precinct buildings.

As mentioned earlier, there is a sharp contrast in the level of definition given between landscape elements and built forms in the proposal. In terms of the former, perscribed details include *'light earth coloured modulated pavers as providing the best surfacing for both walkways and open spaces'*, and information panels *'no more than 1m high, with the panel at a 20° slope towards the point of reading'*. However, this same level of detail is not afforded to the proposed new commercial development, despite it being acknowledged as the key to economic vitality in the area. Only a roughly sketched block outline designates the intended area of the development on one of the plans, and little additional information is given on the built forms other than that *'a height restriction of 10m and appropriate roof pitch design would allow this development to be absorbed into the built character of South Hill'*. Initial criterea outlined in the proposal highlight the importance in retaining major viewshafts to help read the harbour, alongside ensuring that all new built development be distinguishable from its existing surroundings to avoid confusing the integrity of the harbour. Further details would need to be perscribed for built forms in the proposed development to ensure these important initial criterea are met. The proposed development, approximatly twice the size of the existing commercial and industrial area, is intended to *'support a medium to high density development'* with land either sold off in seperate lots or *'alternativly a village-style development could allow a greater concerntration of leasable business space'*.

The former goods store (*figure 29*) is the only building on the site to be discussed in some detail in terms of potential uses and architectural treatment, although the descriptions are still vague. A 1970's era government designed building, the former goods store sits isolated within the open expanse of the former shunting yard. This, coupled with its slightly rotated orientation and bland, disjointed aesthetic leaves the building at odds with the adjacent historic precinct especially. This is acknowledged by Armour who vaguely suggests that '*while the exterior of the building has been seen as out of context with the surrounding architecture, this could be easily remedied with a change of roof pitch and re-cladding the exterior*' (*figure 30*). The proposal sees a new parking hub placed alongside the former goods store, with a suggestion of it accommodating a museum or information kiosk, although this could disrupt existing museums in the CBD and historic precinct as well as the nearby iSite. An indoor market or craft brewery are among other suggested programs for the building, and are probably more appropriate for the building type. Although, as the goods shed holds no particular historic or aesthetic value, the best option may be to remove it to make way for more appropriate structures. A visit to Oamaru by the author identified a number of historic buildings located around the edge of the site that are also currently unoccupied and in varying states of disrepair, which were not addressed in the proposal. One such structure is Meek's Elevator building, which is located at a key intersection in the area, and with urban and architectural interventions has potential to strengthen links between the harbour and the lower CBD.

A small amount of work has already begun on the 'Harbourside' proposal, with sea-wall repairs, restorative plantings and some initial pathway preparations under way, however as the development is phased there is still time to address issues and modify objectives and aims for the proposal.

4.3 Design Implementation

Due to the time frame of this study, it is unrealistic to be able to resolve the design of the site entirely. The design case study for Oamaru will instead focus on the first phase of a multi-phase development which specifically addresses the aims of this research, restoring connectivity and developing the remaining rail-orientated buildings and structures. Phased development is appropriate, especially in a low-growth environment represented by the majority of the cities

investigated for this research.

A site of this size and nature is usually likely to be a multi-disciplinary design, involving a number of specialists working as part of an overall design team. In his book, *Urban Design: a typology of products and procedures*, respected urban design professor Jon Lang examines 50 international case studies to identify four distinct types of urban design implementation, otherwise described as mechanisms available for shaping design means and ends (Lang 2005). These are summarised as;

- Total urban design, is as outlined above, when an entire project is carried out under one auspice and under the direction of an individual designer or group acting as an individual. It is completed as one piece of work from property development to design implementation. The strength of total urban design, their unity of appearance and boldness of form, is often cited by critics as its weakness;
- All-of-a-piece urban design, many urban redevelopment projects are so large in size that single developers and their backers are incapable of financing these single-handed. In these cases, a consulting team develops one illustrative masterplan of the whole development. The pieces of the scheme are parcelled out to different developers and their design professionals to finance the design. To ensure the intention of the masterplan is not lost, each subdevelopment has to be built in accordance with a set of guidelines. Sometimes these guidelines are generic to the whole development, sometimes they are specific to each site developed;
- Piece-by-piece urban design, is more planning based. It does not, like all-of-a-piece urban design, begin with a specific concept plan showing the desired physical end state of a precinct. Rather it begins with a generalised mental image of how an area should perform and what it should contain to get that performance. Zoning controls and incentives are employed to encourage the construction of specific building types, and/or facilities within a particular precinct to strengthen its existing character or create a new one;
- Plug-in urban design, refers to the design and implementation of an infrastructure project in order to obtain some catalytic reaction. There are two types of plug-in design. The first involves the provision of the infrastructure of a precinct and the selling of sites into which individual developers can later 'plug-in' buildings. The second involves plugging the infrastructure into an existing urban fabric to enhance its amenity value. Sometimes the

process of building the fabric of the precinct is heavily controlled, with design guidelines specified for each developer to follow. In this case the process is really a variant of all-of-a-piece urban design, however this approach allows those property developers plugging their projects into the provided infrastructure to be free to respond to the market place as they will. The assumption in this case is that the market knows best what is in demand and thus appropriate to build when required (Lang 2005).

Of these, Plug-in urban design is the most appropriate moving forward to the design case study for Oamaru. This infrastructure-based framework allows a more intensive exploration of connectivity on all levels of the urban web hierarchy from pedestrian to green network systems, within the time frame of this study. Alongside links, the elements of infrastructure include buildings or places providing for special uses that will, it is hoped, have a catalytic effect on surrounding property (Attoe & Logan 1989). This allows for rail-orientated elements and buildings to form an integral part of the design, adding a point of difference for the area. Subsequent phases of the development are able to be addressed and outlined through guidelines, specifically to define new built forms to ensure they are appropriate and sympathetic to the scale and heritage of the area.

4.4 Design Criteria

The general issues and criteria identified and outlined in the previous two chapters are assessed against the Oamaru site analysis to create a set of site-specific criteria that will inform the design case study in the following chapter, and subsequently evaluate it.

- *Dissecting the 'super-block'*

The harbour and historic precinct are intertwined with each other, however the large expanse of empty open land left after moving the shunting yard to the northern end of town has created a large physical barrier between the two. What rail, harbour and storage associated buildings that did exist, referencing the 1962 photograph (*figure 27*) have been mostly removed, with only one isolated goods store and a small block of industrial buildings on the waterfront remaining. After moving through the narrow streets, between the tall buildings in the historic precinct, the emptiness of the former shunting yards leading to the waterfront is exaggerated.

This open 'super-block' needs to be dissected to a scale that is sympathetic not only to the neighbouring blocks, but also to the historic precinct, to allow for continuity through and beyond the site.

- *Recognising industrial heritage*

Consideration must be given with regard to the railway goods yard and the surrounding harbour, and its place in the early history and growth of Oamaru as a commercial port. Because the port closed to commercial shipping at the end of the conventional shipping era it has retained its original character, unlike other ports in similar centres that underwent significant restructuring to accommodate larger modern ships. The harbour holds the distinction of being New Zealand's oldest surviving authentic Victorian-era port, a fitting parallel to the historic precinct.

The site contains a wealth of rail-orientated buildings and structures and it is important that parts of this are retained, preferably in a useful capacity either for tourism or local business, to maintain a rail context on the site.

- *Networking green spaces*

There are a number of existing green space systems in the wider Oamaru context, with the botanical gardens and the Cape Wanbrow reserve the most prominent. The coastline also forms another system, and is currently un-developed with areas to the north of the site in particular suffering from erosion at a dramatic rate. With the site positioned in very close proximity to these three systems especially, an opportunity is afforded to network these systems through the site itself. Incorporating new and existing pedestrian paths through green corridors can help raise the profile of both while providing strong external links in to and through the site.

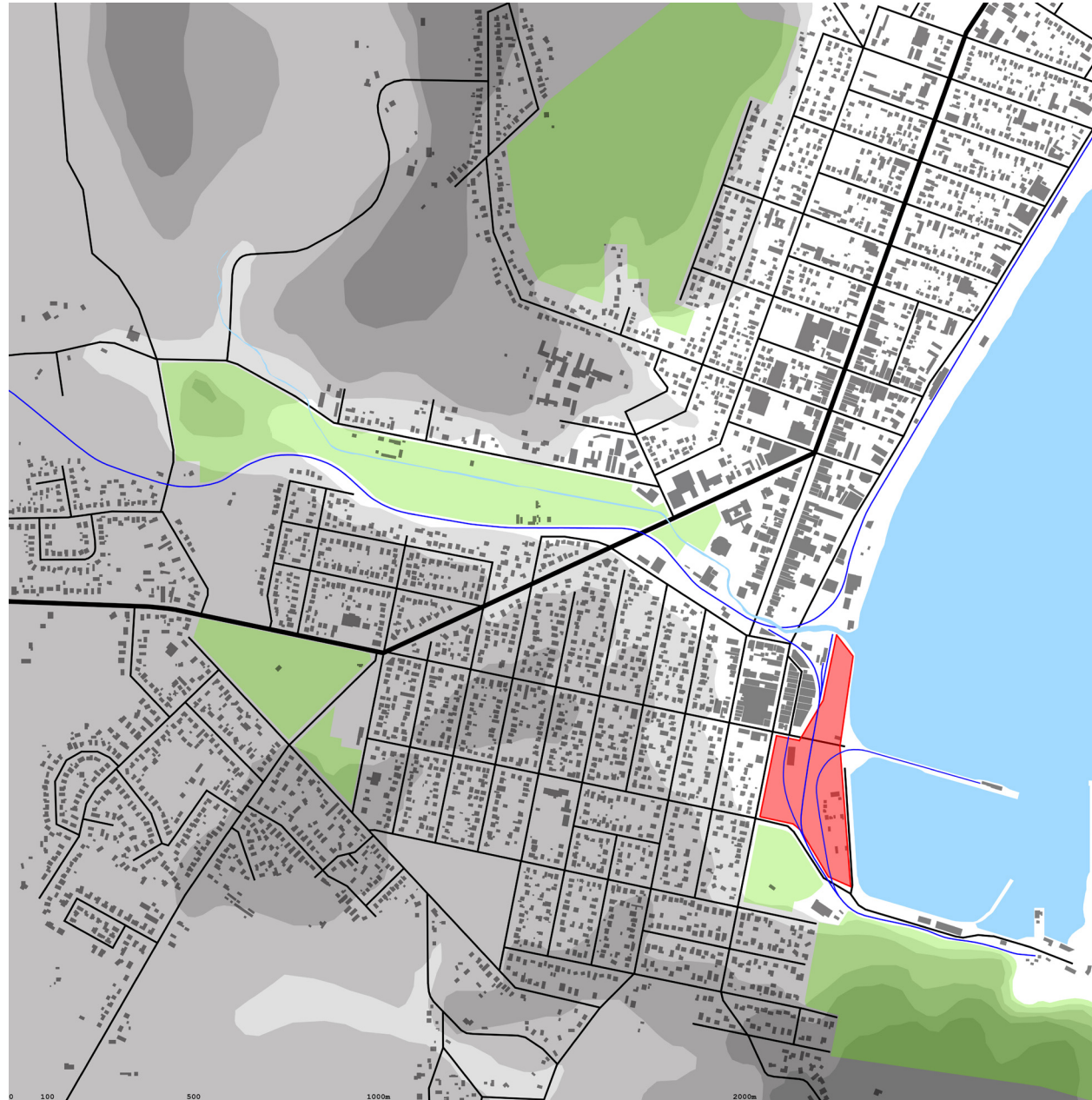
- *Additional considerations*

Alongside these main site-specific criteria there are additional considerations to factor in to the design.

As Armour highlights in the 'Harbourside' proposal, viewshafts are critical in reading the character and context of the harbour setting. People find it easier to orientate themselves and recognise when new development safeguards important views between places or creates new ones (English Partnership & Housing Corporation 2007). Important

reference points such as the clay cliffs of Cape Wanbrow, Holmes Wharf, and the historic precinct should maintain a high level of visibility across the site, and be strongly represented in lines of sight. The extensive amount of rail sidings that formerly covered the site to service the neighbouring harbour activities meant that the area was, and still is, largely devoid of buildings. Site-specific guidelines will play an important role in defining and shaping the forms of new buildings within the site to be sympathetic to these requirements.

fig 31: Graphic Analysis of wider Oamaru context



5.0 Oamaru Case Study - Design

This chapter presents a design response for the former rail and port areas of Oamaru. The design case study focuses specifically on the first phase of development. Primary design decisions were made initially at a masterplan scale, in response to design criteria identified in the previous chapter. The masterplan is then presented in a series of layers, with each layer discussing a particular system within the plan and the design decisions that formed them. Guidelines are used to define future built development on the site. Finally, an important intersection within the masterplan was developed at an architectural scale, focusing on an unused historic building and its immediate urban surroundings. This is followed by a discussion of the overall scheme.

As the former shunting yard area is largely undeveloped, there is plenty of scope for new built development. This design case study seeks to cater for new commercial and residential ventures, in an area where opportunities are sparse within such close proximity of the existing main street and associated civic amenities. The intention is to counteract the commercial and residential sprawl taking place along State Highway 1, which is seeing the northern end of the town stretching further and further out. Most of the 27 sections in a recent sub-division on nearby Cape Wanbrow have been sold and approximately 10 new houses are built each year according to the local council. So despite the relatively stagnant population statistics, it is reasonable to assume that housing can be included successfully within the scheme due to the extended timeline for the development.

It is beyond the scope of this study to design a completed development for this site. As discussed in the previous chapter, the challenges associated with developing a large-scale area within a small center require the project to be

fig 32: Aerial photograph of existing site



split into phases, that can be implemented over a long period of time. Due to the low-growth environment of Oamaru, each of these phases should represent an end-state, completed to a point where it can exist for a period, in the scope of this study potentially 5-10 years, before the following phase is implemented.

The first phase focuses on connectivity and structuring the site to direct future development. Pedestrian, green and vehicle movement systems dissect the site into manageable blocks that relate to the surrounding street grid, and create new links between previously severed paths, or enhance existing paths by making them more accessible.

The proposed commercial and residential area is defined at this stage by guidelines outlining a 'buildable bulk' mass, that indicates minimum and maximum floor areas and building heights around sections of the site. The purpose of this mass is to direct how the built development will take form even from this early stage, ensuring that important sight lines around the harbour are retained, the scale and impact of the historic precinct is protected, and thoughtful positioning of initial structures creates a solid platform for the area to succeed.

Pivotal in the first phase is the development of the currently unoccupied Meek's Elevator building. This structure lies at the heart of a key intersection in the masterplan, acting as a gateway into both the site, the waterfront, and the historic precinct. Addressing this at an architectural scale, combined with urban interventions, provides an investigation into the inter-play between integration and industrial heritage in built forms, and a precedent development for other similar structures around the site.

5.1 Masterplan

The overall proposed masterplan for the former railway goods yard in Oamaru (*figure 33*) is presented with brief comments. The following pages then see the masterplan proposal split into layers (*figures 34 - 38*), discussing the design of each individual system in turn. Key design decisions for each system are bulleted, and then elaborated on in the following paragraph/s.

fig 33: Proposed masterplan for the former railway good yard in Oamaru

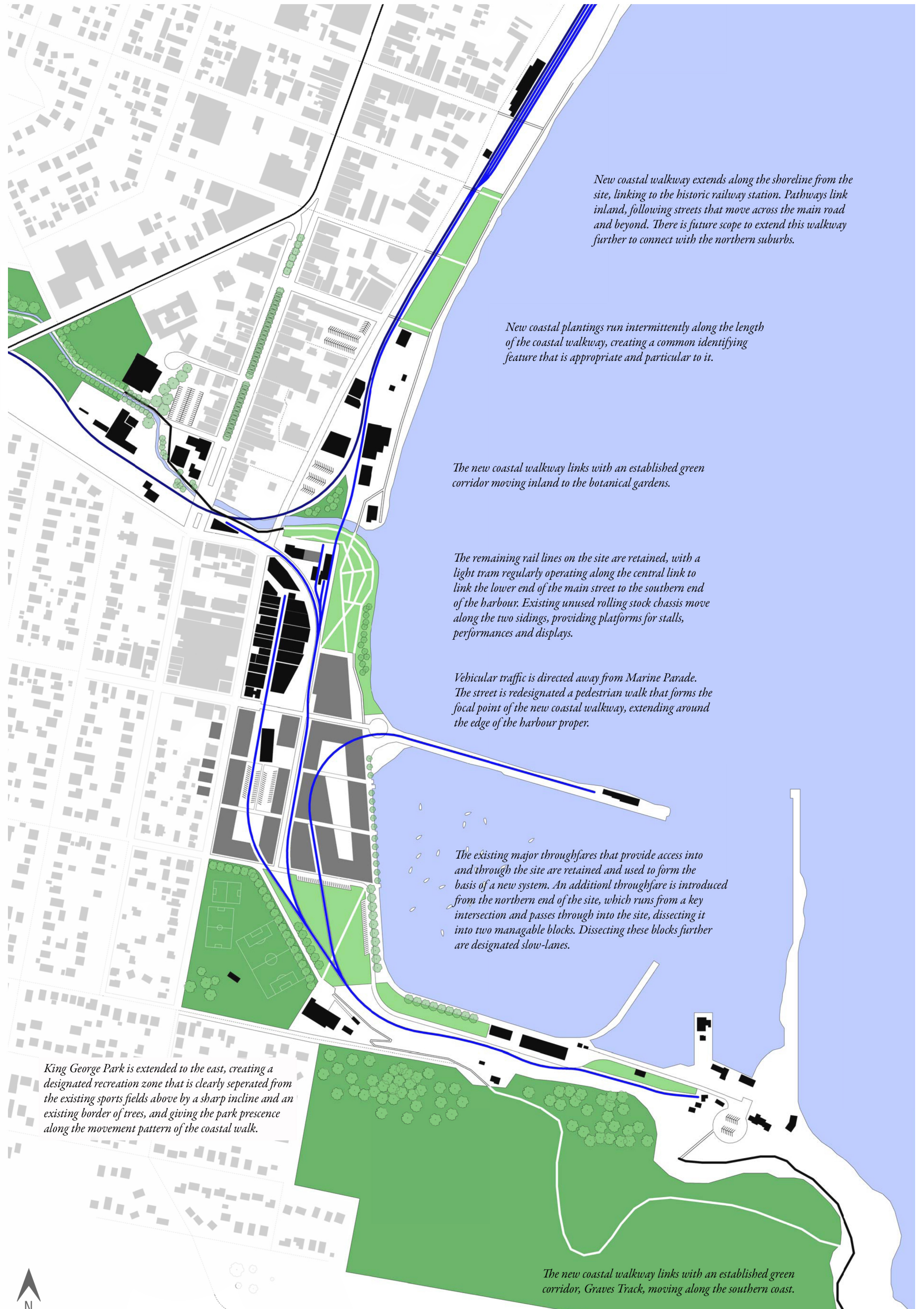


fig 34: Vehicle movement system



- *The proposed northern road (Red) is a formalized version of an existing pathway, in which the area is used to access the rear of the historic buildings on Harbor Street, and provide parking. The new road follows the existing rail line, which is recessed into the road surface, and is intended to provide a new entrance for the development following on from the bottom of the main street.*
- *Arun Street (Blue) is extended further towards the waterfront to allow for the extension of the adjoining park. It is foreseen that this road will primarily be used by members of the Oamaru Yacht and Powerboat Club, and visitors to the penguin colony.*
- *Narrow slow-lanes (Green) provide pedestrian and vehicle access through the site to the waterfront, as well as creating view shafts through the built-up area.*
- *Marine Parade (Orange) is redesignated as a pedestrian walk that will form part of a coastal walkway, discussed later in this chapter.*

5.1.1 Vehicle Movement

Although the ‘superblock’ created by this particular site is not as large as in some of the other examples researched earlier, this new road system seeks to dissect the former shunting yard area into blocks that are comparable to the neighbouring residential areas. The existing major thoroughfares that provide access into and through the site, Wansbeck and Arun streets, are retained and used to form the basis of the new system. An additional thoroughfare is introduced from the northern end of the site, which runs from a key intersection and passes through into the site, dissecting the space between Wansbeck and Arun streets into two manageable blocks.

Dissecting these blocks further are designated slow-lanes for use by both vehicles and pedestrians. These lanes, narrower than the surrounding streets, are intended to introduce an intimate sense of scale within the development that is sympathetic to the adjacent historic precinct, as well as allowing retention of viewshafts through the built-up area and towards the harbour.

While vehicular through traffic within the development is not to be encouraged, with light rail and walkways the preferred alternatives, acknowledging and catering for parking is essential. Parking needs are best met by a central parking area that facilitates the residential and commercial areas, with smaller separate parking areas that service the historic precinct, King George Park, and the penguin colony.

fig 35: Pedestrian movement system



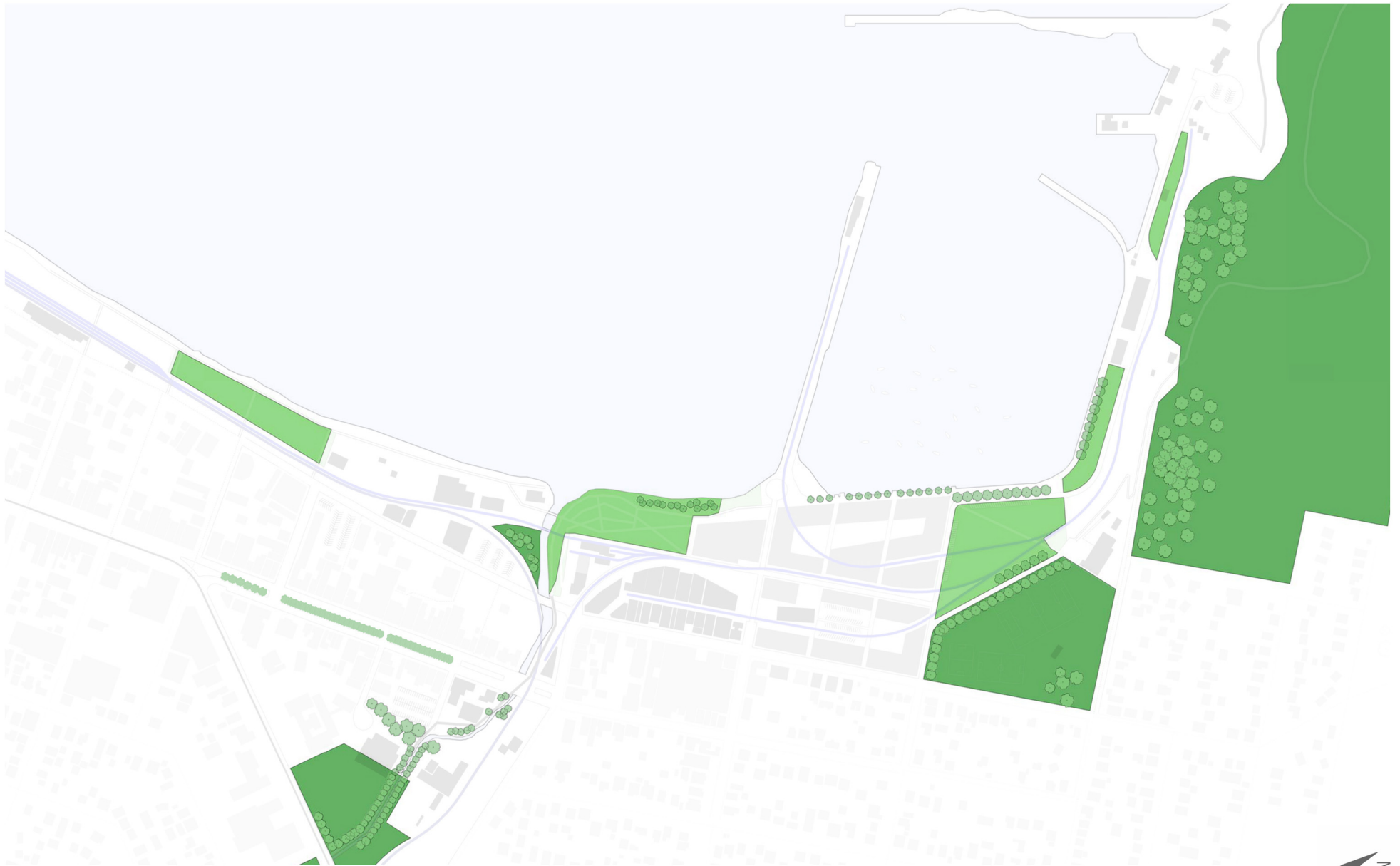
- *A new waterfront walkway (Red) begins at the historic railway station and follows the coastline to and around the harbor. It is intended to create a new zone of interaction with the coastline, and encourage locals and tourists to engage with the water and both the existing and proposed amenities associated with it. Areas to pause are created along the walkway in the form of seating, viewing platforms, and steps leading to the water. The walkway also draws together the inland botanical walkway, and Grave's track at the southern end of the site.*
- *The botanical walkway (Blue) is an existing system that follows alongside the creek as it moves through the gardens and makes its way to the coastline.*
- *Grave's track (Green) is an existing trail that starts at the quarry and moves along the coastline south of Cape Wanbrow.*
- *Marine Parade (Orange) is redesignated as a pedestrian walk that forms the focal-point of the waterfront walkway.*
- *A new walkway (Pink) climbs a section of the clay cliffs, linking the waterfront walkway, through King George Park, to an existing path across the Cape Wanbrow reserve. The walk up the cliffs offers a unique vantage point with views across Oamaru, over the harbour and up the coastline.*

5.1.2 Pedestrian Movement

There are a number of existing pathways for pedestrian and cyclist use throughout Oamaru. Of particular importance to this design are the two systems in proximity to the site, the inland botanical garden walkway and Grave's track which runs along the coastline south of Cape Wanbrow. To tie the loose ends of these systems together a waterfront walkway is proposed. With vehicle traffic now directed away from Marine Parade, this former street is redesignated as a pedestrian walk that forms the focal-point of a this new walkway. Sections of the coastline north of the site are badly eroded and the walkway presents a structure that can assist in restoring and strengthening these fragile areas. The waterfront walkway features a series of node points along its length that refer to and link with inland features and movement patterns.

The pedestrian system is incorporated within the green network outlined in the following page, creating green corridors that enhance the profile of the walkways, create enjoyable routes for pedestrians and cyclists, and encompass a range of characteristics along their length.

fig 36: Green network system



- *A system of coastal plantings (Light Green) runs alongside sections of the coastal walkway and waterfront walk, and is intended to create a green corridor that ties together the loose ends of existing green networks into one overall network.*
- *King George Park (Dark Green) is expanded east to allow for a new recreational park space that doesn't disrupt the existing sports pitches. The two spaces are differentiated by the change in height between the upper existing level, and the new lower recreation level. The Park has been expanded towards the waterfront to improve links to both the water and the movement patterns of the waterfront walk.*

5.1.3 Green Network

A network of planting follows the walkways discussed on the previous page, with the intention of creating green corridors that ultimately aim to link the botanical gardens with the forest reserve on Cape Wanbrow, via the harbour and waterfront. While the existing botanical walkway and Grave's track are established green corridors already, the proposed coastal walkway and waterfront walk are currently largely devoid of any formal planting, instead lined mostly by gorse and other thick bushes, rocks, and debris from nearby industrial sites. This allows for a new system of coastal plantings to run intermittently along the length of the walkway, creating a common identifying feature that is appropriate and particular to it. These plantings are particularly important along the coastal walkway north of the site, where they are placed to help strengthen delicate areas of coastline.

The harbour area has been known to host circuses as early as the 1880's and carnivals until the late 1970's. Caroline Bay in Timaru has hosted an annual summer carnival for over a century, continuing to prove a popular attraction. With this in mind, King George Park is extended to the east, creating a designated recreation zone that is clearly separated from the existing sports fields above by a sharp incline and an existing border of trees. Not solely for picnicking and play, this open area could also host such attractions that would enhance the profile and ambience of the area. The eastern edge of the park looks to link with the waterfront walk to give it some presence along this movement network.

The location of the new park extension also offers ideal opportunities to sit and reflect on the area, with views through the development to the historic precinct, along the clay cliffs and across the harbour.

fig 37: Rail movement system



- *As highlighted in the previous chapter, most of the rail lines have been cleared from the site, with only three distinct lines remaining.*
- *The central line (Red) starts at the base of Thames St, beside the Oamaru information centre, and terminates at the southern end of the harbor, adjacent to the penguin colony. This line cuts through the center of the site, and is periodically used by local steam enthusiasts to display and run their collection on open days as an attraction for locals and tourists alike. The line also crosses the creek to the north of the site, running alongside the main trunk line through to the historic railway station.*
- *The remaining two lines (Blue) form sidings from the central (Red) line.*

5.1.4 Rail Sidings

The remaining rail lines that pass through the former goods yard give an opportunity to retain an aspect of the sites heritage in a practical capacity by allowing a light tram to regularly operate along the central line, creating a strong link between the siding at the bottom of the main street to the siding at the penguin colony and adjacent restaurants. This allows visitors the option of travelling to the southern end of the harbour by tram, and walking back along the waterfront walk, or vice-versa. The intention is to reduce visitor's vehicle traffic through the site by offering a unique alternative for travelling through the site and around the harbour.

Alongside this, the unused rolling stock chassis' on-site can be rebuilt as moveable temporary stages for performances, stone carving competitions, displaying artworks, or even temporary stalls for vegetable or flower sales. These would be free to move around the two siding lines when required, and stored alongside the locomotive shed on a separate small siding where they currently reside.

fig 38: Maximum indicative built fabric



- *The existing built forms (Black) that comprise Oamaru present a range of sizes and forms. The densest concentration of buildings lies within the lower CBD in Thames Street and the historic precinct.*
- *The historic precinct (Red) represents a large area of built forms adjacent to the site.*
- *There are a number of unoccupied historic buildings (Blue) lining the edge of the site with potential for development.*
- *The proposed built development (Grey) is represented by a 'buildable bulk' outline, that outlines the maximum limits of construction in terms of height and area. This creates an initial structure for future buildings to be constructed within that protects important view shafts and respects the scale of the adjacent historic precinct.*

5.1.5 Built Fabric

With the first phase predominately focused on creating a framework for all new built development to 'plug-in' to, the proposed commercial and residential area is defined at this stage by guidelines outlining a 'buildable bulk' mass, that indicates both minimum and maximum floor areas and building heights around sections of the site. The purpose of this mass is to direct how the built development will take form even from this early stage, ensuring that important sight lines around the harbour are retained, the scale and impact of the historic precinct is protected, and thoughtful positioning of initial structures creates a solid platform for the area to succeed.

People find it easier to orientate themselves and recognise when new development safeguards important views between places or creates new ones. Visual links between, for instance, a hill, an important building or historic feature beyond the site can be used to create sightlines, in which open spaces, pedestrian uses or a new street can run (English Partnership & Housing Corporation 2007). The main sightlines that this mass looks to preserve, highlighted in (figure 39) are;

- from the historic precinct to the clay cliffs, an important geological feature and reference point in the harbour.
- from the historic precinct to the harbour through Wansbeck Street, looking along the length of Holmes wharf.
- from the historic precinct to King George Park, through the centre of the new development.
- pedestrian eye-level views of the harbour from Tyne Street, looking through the new development.
- the existing views across the harbour from the elevated houses on the opposite side of Tyne Street.

fig 38: Important sightlines



In plan the proposed maximum mass is similar in scale to the commercial area of lower Thames Street and the neighbouring historic precinct, and is twice the size of the commercial area designated by Armour in his Harbourside proposal. While this seems large, it is reiterated that this development is taking place over an extended period of time and is not expected to fill up instantly. With this in mind, the minimum mass (*figure 40*) specifies preferred footprints for critical areas of the site, anticipating a pattern that will still work when there are holes or gaps in the built development. The minimum mass focuses on intensifying edges along the three main edges (highlighted), particularly along the waterfront walk to frame the pedestrian space clearly and provide amenities and attractions for pedestrians. The other two edges are intensified to maintain a built edge, creating visual and physical continuity along these streets.

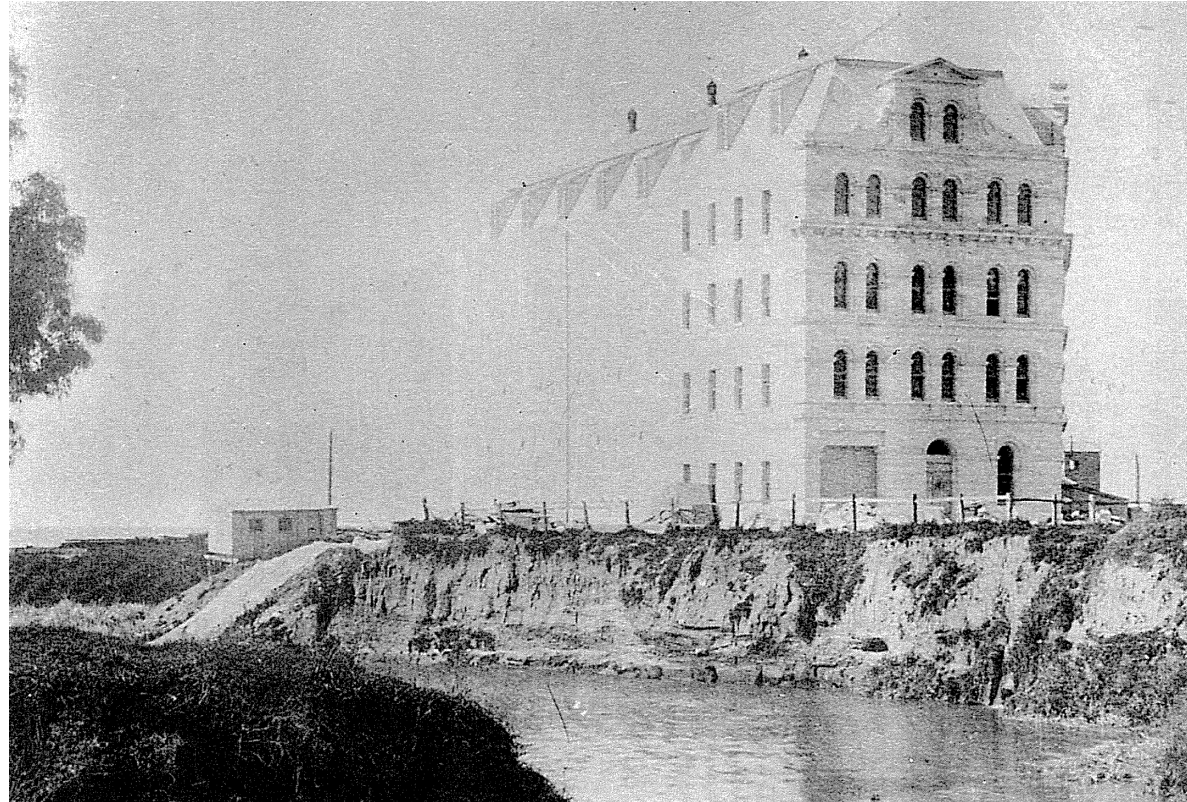
The small number of existing industrial buildings on Marine Parade, remnants left over from the harbours hey-day, hold leases on the land that are yet to run out. As has occurred in the Wynyard Quarter development in Auckland, it is expected that the land, recently purchased by the local council, will be put on hold for use as part of the new development as the leases end. As highlighted in the Harbourside proposal, the northern section of Marine Parade is earmarked for a reconstruction of the original Friendly Bay tearooms, along with changing sheds and public toilets. Although little is currently known about these projects, it is suspected that the tearooms will consist of predominately timber construction and cladding. The existing rowing club neighbouring this site are also wanting to retain their waterfront position, with a new clubhouse and garage planned.

The area is designated mixed-use, with light commercial and retail expected to fill the eastern side of the development along the waterfront, and residential to fill the quieter western side that borders Tyne Street. Combining the primary activities of living and working supports a greater variety of secondary facilities, whether commercial, entertainment, leisure or community based (English Partnerships & Housing Corporation 2007). This also creates activity across the site beyond daytime office and shopping hours, allowing a greater sense of safety with 'eyes on the street' and enhancing the experience for locals and visitors alike.

fig 40: Minimum indicative built fabric



fig 41: Meek's Elevator Building (1887)



5.2 Architectural Scale Development - Meek's Elevator Building

Landmarks, such as distinctive buildings, help to provide reference points and emphasise the hierarchy of place. They are best created at main centers of activity, where they are the focus of converging major movement patterns (Gehl 2010, English Partnerships & Housing Corporation 2007)

The following design focuses on developing an area within the master plan, emphasizing built and urban design solutions at an architectural scale. The area chosen for further development is centered on the 'Meek's Elevator' building, a prominent site near the junction of the waterfront and inland walkways, and a proposed entry point through to the new development that connects to the lower main street of Oamaru. The scope of the design is limited by a lack of existing internal plans or photographs, as was the case for a number of early structures within the historic precinct in Oamaru. Instead the focus is on developing the exterior of the building and its relationship to the immediate urban context. The building lies at the heart of a key intersection in the masterplan, acting as a gateway into both the site, the waterfront, and the historic precinct.

'Meek's Elevator' building is one of a small number of structures within the historic precinct that has not yet been restored. Designed by local architects Forrester and Lemon as an American style elevator grain store, and completed in 1883, the building was a landmark in the district due to its mammoth size, standing five stories tall and with 5,100sqm of floor space, until a fire destroyed the upper two floors and rear portion of the building in 1920 (McCarthy 2002). The crumbling wall at the rear and the rough parapet around the top are all that remains to indicate the former configuration of the building. Currently, the building is mostly empty, with the local Steampunk club using the bottom floor as a storage facility for their materials and sculptures. The club recycles local rail artifacts and mechanical materials, and their completed artworks are distributed around the town and further abroad in public spaces.

'Steampunk' is 'a search for where society might have taken a wrong turn at the end of the Victorian era.' The movement encompasses most areas of design and art, with a common aesthetic revolving around sci-fi and fantasy themes, steam power, and industrial revolution era engineering. With the authentic harbour and historic precinct a fitting

fig 42: Meek's Elevator Building (2010)



background, steampunk is gaining momentum in Oamaru. With this in mind, the basic architectural program for Meek's Elevator building revolves around the steampunk club and their need for a generous covered workshop, indoor areas to store and display smaller works, and designated clear areas to host swap-meets and activities. The steampunk theme offers an interesting palette of materials, including copper, brass, timber, glass, steel and iron. Corten steel is a material with the right aesthetic, that will compliment the aging of the existing stone structure while also, through modern precision cutting, folding and mounting methods, be distinguishable from the authentic historic sections of the building.

5.2.1 Architectural

Sculptural elements, constructed of folded Corten steel sheets and mounted above the two main facades, are a continuation of the original form of the building before the fire. These elements are intended to both celebrate and inform people of the previous configuration of the structure, while bringing it back to near its original height. This additional height increases visibility of the building from the main street and other vantage points across the town, creating an identifiable reference point for the historic precinct, the development beyond it, and the inland botanical walkway.

The original bulk of the eastern end of the building is reintroduced, housing a large covered workshop and storage area. The additional bulk enhances the proportions of the building, giving it a stronger presence in view shafts from the harbour and CBD areas. The main features of the workshop are the large gantry cranes that move along the length of the addition, supported by their own secondary structure that lies within the steel portal frames that follow the form of the existing historic building. The northern and southern walls of the addition are completely glazed, and wrapped by folded Corten steel louvres. The purpose of the louvres is not solely to allow for plenty of natural light, but also to evoke a sense of permeability about the new section of the building, contrasting against the solid, heavy mass of the existing stone structure. The interplay between new and old is particularly striking as the Corten louvres follow the shape of the crumbling stone wall of the building, featuring a strong contrast of vertical and horizontal lines, materiality and colour.

5.2.2 Urban

With the allocation of storage space within the new rear section of Meeks Elevator building, the existing outdoor storage and work area is able to be reduced by half to allow for a public courtyard, which extends around to the front of the building and also encompasses an area to the west, across Tyne Street next to the railway platform. This western area is critical to include within the scheme due to its high profile. It links directly to the historic bridge at the lower end of the main commercial street in Oamaru, neighbours the local iSite and historic museum, and with the proposed light rail system in place it services a public transport terminal. Currently consisting of an uneven gravel surface, roughly bordered by overgrown bushes and trees that obscure the entrance and sightlines through the space, it is intended that by formalising this area these qualities may be better exploited. The same is true for the area surrounding the building, which is in an equally rough state. By formalising, it is meant that the area is given clearer definition, through simple landscaping features such as paving, appropriate planting and furniture, alongside easily recognisable movement patterns and destinations.

This is implemented by creating a paved surface around both Meek's Elevator building, and the rail platform across Humber Street, clearly defining the borders of each area by introducing curbing along the edges that line the street, and along planted areas. The paved pattern is based on squares, rotated at 45° from the Elevator buildings orientation, criss-crossing along the face of the structure. The pattern creates an easily identifiable link between the two areas on opposing sides of the street, while also subtly inviting pedestrians to follow the lines within the squares with their eyes and/or feet. These lines could potentially attract a wandering pedestrian through to the waterfront walkway entrance left of the building, or the historic precinct to the right. This principle can also apply in the opposite direction, leading across the rail lines into the historic precinct, or towards the rail platform area and on through to the main street.

Access is required to and from the outdoor workspace for delivery of materials and collection of works, although it is envisaged that this will only be occasionally used. This is catered for by a driveway that doubles as a path, running from

Humber Street and along the length of the building, effectively dissecting the area around the building in two. The driveway is met, on the opposite side of the street, by a similarly treated path that runs the length of the area, from the main street, through to the railway platform and finally towards the building. Separate to the paved areas, these paths provide a definite and purposeful trajectory intended to draw pedestrians off the main street and through to Meek's Elevator building, where, continuing along the driveway all aspects of the structure can be taken in, from the decorative front facade, to the simpler forms around the sides, as well as both the proposed sculptural elements and covered workshop additions.

Corten steel is introduced to the urban scheme, referencing the materiality of the proposed additions to the building, and specifically the folded construction of the sculptural elements. The Corten panels are used to provide low fencing, folded to incorporate seating bases, that line sections of both areas where they border gardens, offering a place to relax in the shade. Similarly, folded Corten panels form standalone seating bases within the paved area around the Elevator building in particular, providing opportunities to take a moment to reflect on the structure and surroundings.

In terms of vehicular traffic, a proposed road follows the rail lines from the intersection and into the historic precinct, eventually linking with the new development. This is a formalised version of an existing accessway into the harbour.

fig 43: Aerial photograph of existing Itchen/Tyne/Humber Streets intersection



fig 44: Proposed Itchen/Tyne/Humber Streets intersection



fig 45: Proposed rear addition to Meek's Elevator Building

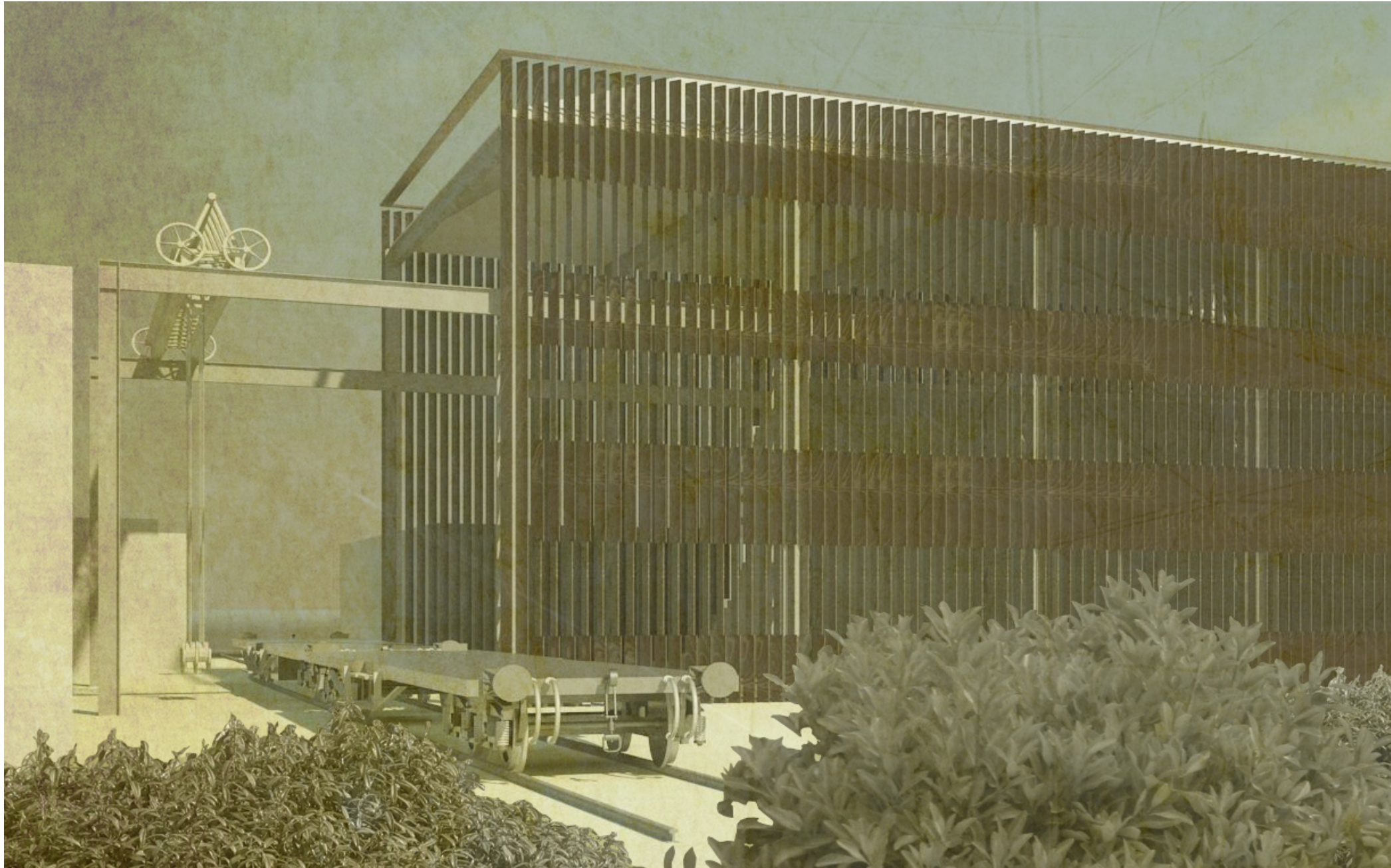




fig 46: Existing approach from Thames Street



fig 47: Proposed approach from Thames Street



fig 48: Existing approach from Tyne Street



fig 49: Proposed approach from Tyne Street



5.3 Discussion

The design case study for Oamaru meets the initial research aim of re-integrating the former railway goods yard with its urban surroundings, while maintaining the presence of cultural and industrial heritage. At an urban scale this is illustrated particularly through the adaption of the existing rail lines and sidings through the site. In a practical capacity, operating as a unique alternative form of public transport through the site, the light rail system links the southern tip of the harbour directly to the bottom of the main street in the town center. This allows visitors the option of traveling to the southern end of the harbor by tram, and walking back along the waterfront walk, or vice-versa. In terms of preserving heritage the presence of rail activity, as well as the retention of the lines in their existing state, creates a strong contextual relationship between the harbour and the historic precinct.

At an architectural scale the relationship between integration and heritage is represented by the two main interventions to Meek's Elevator building. The addition of both the sculptural elements above the main two facades and the workshop at the rear of the building enhance the proportions of the structure, giving it a stronger presence in view shafts from the harbour and town center, creating an identifiable reference point for the historic precinct, the inland botanical walkway, and as an entrance to the new development. In terms of preserving heritage the addition of the workshop allows the currently redundant and mostly empty building to be re-used by the local steampunk and locomotive enthusiasts. Unrestored since a fire destroyed the upper two storeys and rear portion of the building in 1920, the additions return it to a finished state influenced by the original form of the structure, while also clearly differentiating new and old. The rustic texture and appearance of the Corten steel compliments the aging of the existing stone structure while also, through modern precision cutting, folding and mounting methods, is distinguishable from the worn, authentic historic sections of the building.

The Urban Design Compendium highlighted that a successful movement framework provides maximum choice for how people will make their journeys, takes full account of the kinds of movement a development will generate, and makes clear connections to existing routes and facilities (English Partnerships & Housing Corporation 2007). The movement framework in the design case study for Oamaru relates to each of these points, along with maintaining a

positive emphasis on pedestrian, bicycle and public transport over private vehicles. This emphasis is highlighted in a number of ways. Firstly, re-using the existing rail lines in a practical capacity, allowing a light tram to operate along the central line, creates a strong link between the siding at the bottom of the main street to the siding at the penguin colony, a popular destination in Oamaru, and the adjacent restaurants. This allows visitors the option of travelling to the southern end of the harbour by tram, and walking back along the waterfront walk, or vice-versa. The intention is to reduce visitor's vehicle traffic through the site by offering a unique alternative for travelling through the site and around the harbour. Secondly, combining pedestrian and cycle routes within the green network creates recreational corridors that provide safe, enjoyable and varying spaces for people to move through, encompassing several areas of the city and points of interest throughout.

Most of the sites examined in this research are in proximity to loose networks of green spaces and waterways. Perhaps the most effective system of integration is in the networking of these green spaces through the site. As illustrated in the design case study for Oamaru, the network of recreational green corridors reach further from the site, linking to the extremities of the city along with the areas inbetween. With the site encompassing major amenities in the harbour, Friendly Bay beach and the coastline, these recreational green corridors render the site easily and directly accessible from most areas of the city. The same scenario can be assumed to be effective particularly in Greymouth, Blenheim, Gisborne and Whangarei, due to the strength of their existing networks of green spaces and waterways.

The design case study for Oamaru offers significant scope for further future development. The design case study presents an overall masterplan before focussing on one particular area, highlighted for its importance within the plan and also to act as a precedent for subsequent developments. This leaves scope for further detailed planning at a wider level. The first area of focus should be the former railway goods shed, situated at ... Most likely designed and built in the 1970's, this government-issue building is more typical of those found within the rail sites examined than the historic Meek's Elevator building. The railway goods shed has had significant adaptations and holds less aesthetic appeal than the neighbouring historic structures, but does have some interesting rail-orientated features, including raised loading platforms, that assist in reading the former use of the building, the adjacent railway siding, and the area.

Through outlining design guidelines and allowing the market to dictate what is required in the area, changes in program and use can be easily incorporated. To predict these would require a more in-depth study of local facilities, amenities and market trends, but this would allow for creation of tighter and more specific guidelines to achieve a more definite direction for the area to follow.

6.0 Discussion/Conclusion

Economic and technological shifts over the last half of the 20th century have seen widespread changes in the way the New Zealand rail network operates, and are continuing to lead to the eminent decline of sections within the network as priorities shift to ensure its long-term survival as a whole. The decline in rail operations to the present point has already seen railway stations, goods yards and associated industrial areas in many rural areas and some smaller centers falling into disuse, and it is inevitable that many more will follow.

The aim of this research was to identify and analyze these rail facilities, both redundant and operational, within provincial New Zealand cities with the intention of establishing possible strategies for re-integrating these sites back within the surrounding urban fabric of their respective cities, while retaining links to the cultural and industrial heritage of the sites in terms of the role they played in the birth and development of provincial New Zealand.

The initial overview of existing literature highlighted gaps regarding the redevelopment of brownfield, particularly rail-orientated, sites in smaller urban centers. Indeed this was also the case regarding urban design theories and practices. Instead, through acknowledging and understanding the basic differences and similarities between the downtown areas of small and large urban centers, outlined by Kent Robertson, it was possible to extract information that was relevant to the scope of this research from the wider body of knowledge. A number of smaller city downtown attributes, particularly the human scale of built forms, walkable distances between destinations and a vibrant and practical mix of building types and uses, highlighted that the provincial cities at the focus of this research already strongly represent many of the positive attributes of current urban design theory and practice.

The two literatures examined - integration & connectivity and industrial heritage - identified two approaches to re-using redundant railway facilities in provincial New Zealand cities. Investigations of connectivity through mapping studies identified the disruption caused by rail sites to the movement patterns of the surrounding urban fabric, with the predominant recurring issue across all of the sites being a lack of permeability into and across them due in particular to the number of rail lines and sidings. Jacobs highlighted the problems these dead-ends causes to the usability of neighbouring streets and spaces. Dissecting the site with direct, clear connections between main streets and destinations either side to create movement across the site provides a basis for new development to grow and improves the quality of and access to areas neighbouring the site. Investigations into the industrial heritage of the rail sites reiterated their status as important historical and cultural assests, not only due to their part in the establishment and growth of provincial New Zealand but also the impact of rail on mankind. Recent expansions in regards to what is considered a heritage resource have placed emphasis on the importance of retaining the contextual setting of such sites, rather than isolating and retaining individual elements. As a result, it was argued that these rail facilities are important enough to warrant retention as an entire system, in their original setting to provide sufficient state of completeness and authenticity.

These two approaches are seemingly at odds with each other, as retention of a entire rail context within a site, even when redundant, would still affect and restrict connections across the site and severely limit the scope and scale of new development within the site. This would effectively create a situation not dissimilar from the status-quo. This conflict can be avoided through only selecting and retaining elements that are critical in allowing an understanding of the contextual setting of the site. For instance, it is not nessecary to retain the entire system of rail lines and sidings, instead by isolating a main indicative rail line along with two or three sidings as organisational elements a strong physical and visual rail-orientated presence can be maintained in the site. This then reduces the disruption to connections across the site, and importantly allows more space within the site for new development, allowing a greater oppertunity to successfully integrate the site within the surrounding urban framework.

The graphic analysis of existing and operational rail facilities highlighted a number of attributes unique to rail sites in provincial cities. Predominantly, most of the sites were in close proximity to their respective town centers. Instrumental in the establishment and growth of the towns, these facilities have generally retained a high profile as the towns have developed, even as their importance and role within society has dwindled. This is partially due to the lack of pressure to develop these sites, with an abundance of greenfield land on the city limits that, in today's auto-dependant society, is only a short trip from the center of town. Secondly, most of the rail sites, both redundant and operational, still retain most of their original rail elements, which is argued to be an asset as it contains a context for a railway structure and setting (Riskin 2005). Thirdly, the buildings in the rail sites were either isolated within the center of the sites due to their position between the rail lines, or were bordering the site and remaining in contact with the surrounding built environment. From a pedestrian perspective these two differing configurations can significantly affect how the site is perceived. The former appears more open and accessible, while the latter presents an edge that physically and visually blocks the site off from the surrounding environment, with the main facades of the buildings opening inward to the rail sites, effectively turning their backs on the city. Lastly, a majority of the sites were bordering or in proximity to green spaces and have strong connections to waterways and coastlines due to historic associations with the shipping industry.

From the extensive mapping and selection process it is fair to say that the Oamaru site is representative of the majority of the sites examined, sharing many of the common characteristics and issues identified, alongside unique challenges including restrictive land-forms and the historic harbour and precinct settings. However, not all of the remaining sites contain the wealth of cultural and industrial heritage as the Oamaru site, nor the wealth of amenities near by. This is not to say the processes and decisions outlined in the design case study for Oamaru would not translate to these remaining sites, instead it may mean the infrastructure scope may need to be extended further outwards from the site to connect with major movement patterns and amenities. This is particularly the case for the satellite sites in Masterton, Whanganui and Palmerston North.

Most of the sites examined in this research are in proximity to loose networks of green spaces and waterways. Perhaps

the most effective system of integration is in the networking of these green spaces through the site. As illustrated in the design case study for Oamaru, the network of recreational green corridors reach further from the site, linking to the extremities of the city along with the areas inbetween. With the site encompassing major amenities in the harbour, Friendly Bay beach and the coastline, these recreational green corridors render the site easily and directly accessible from most areas of the city. The same scenario can be assumed to be effective particularly in Greymouth, Blenheim, Gisborne and Whangarei, due to the strength of their existing networks of green spaces and waterways.

Should any of the six currently operational sites examined be only downsized rather than made redundant, a highly likely situation in Timaru and Greymouth which service important harbour and mining operations respectively, raises further questions. It remains to be seen whether the approach taken in the design case study for Oamaru could still be applicable in an environment that include active heavy rail-orientated activity. It would raise further challenges particularly in terms of connectivity and restrict the potential uses of both existing and new buildings in the area.

In response to the initial aim of this research, the design case study for Oamaru illustrates that, once redundant, these former rail facilities can be successfully re-integrated with their surrounding urban fabric, without compromising the unique inherent cultural and industrial heritage of the site.

Bibliography

Books

- Alfrey, Judith & Putnam, Tim, *The Industrial Heritage: Managing Resources and Uses*, Routledge, NY, 1992 (2005)
- Almes, David L. & Wagner, Richard D. (ed.), *Design and Historic Preservation*, Associated University Press, 2009
- Atkinson, Neill, *Trainland: How railways made New Zealand*, Random House New Zealand, 2007
- Attoe, Wayne & Logan, Donn, *American Urban Architecture: Catalysts in the design of cities*, University of California Press, 1989
- Bell, David & Jayne, Mark (ed.), *Small Cities: urban experience beyond the metropolis*, Routledge, NY, 2006
- Bentley, Ian, *Responsive Environments: a manual for designers*, Architecture Press, 1985
- Burayidi, Michael A., *Downtowns; Revitalising the centers of small urban communities*, Routledge, 2001
- Burnam, Peter & Stratton, Michael, *Conserving the Railway Heritage*, Taylor & Francis, 1997
- Brebbia, C & Carpi, A, *Design and Nature V: Comparing design in nature with science and engineering*, WIT Press, 2010
- Byard, Paul, *The Architecture of Additions: Design and Regulation*, WW Norton, 1998
- Dixon, Tom (ed.), *Sustainable Brownfield Regeneration: livable places from problem spaces*, Oxford, 2007
- Fitch, James Marston, *Historic Preservation: Curatorial Management of the Built World*, UVP, 1990
- Gans, Deborah & Weisz, Claire (ed.), *Extreme Sites: The Greening of Brownfield*, London, 2004
- Gehl, Jan, *Cities for People*, Island Press, 2010
- Hollander, Justin B., Kirkwood, Niall & Gold, Julia L., *Principles of Brownfield regeneration: Cleanup, design, and reuse of derelict land*, Island Press, 2010
- ICOMOS New Zealand, *ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value*, Auckland, 2010
- Jacobs, Jane, *The Death and Life of Great American Cities*, Vintage Books, NY, 1961
- Lang, Jon, *Urban Design: a typology of procedures and products*, Elsevier, 2005

Lang, Jon, *Urban Design: the American experience*, John Wiley and Sons, 1994

Lietch, David & Stott, Bob, *New Zealand Railways: the first 125 years*, Heinemann Reed, 1988

Lynch, Kevin, *The Image of the City*, MIT Press, 1965

Lynch, Kevin & Hack, Gary, *Site Planning (3rd ed.)*, MIT Press, 1984

McCarthy, Conal, *Forrester and Lemon of Oamaru, Architects*, Rogan McIndoe Ltd, Dunedin, 2002

McLean, Gavin, *Kiwitown's Port: The Story of Oamaru Harbour*, University of Otago Press, 2008

McLean, Gavin, *Oamaru: History and Heritage*, University of Otago Press, 2002

Richards, James M., *The functional tradition in early industrial buildings*, Architectural Press, London, 1968

Riskin, Marci L., *The Train Stops Here: New Mexico's Railway Legacy*, UNM Press, 2005

Ruskin, John, *The Seven Lamps of Architecture*, Dover Publications, NY, 1880 (1989)

Schittich, Christian (ed.), *Building in Existing Fabric: refurbishment, extensions, new design*, Berlin, Birkhauser, 2003

Secchi, Bernado & Boeri, Stefano (ed.), *The Abandoned Areas*, Milano, CIPIA, 1990

Voillet-le-Duc, Eugène, *The Foundations of Architecture*, George Braziller, NY, 1854 (1990)

Voillet-le-Duc, Eugène, *The Architectural Theory of Voillet-le-Duc: Readings and Commentary*, MIT Press, 1990

Web References

District Plan Homepage, Gisborne District Council, <http://www.gdc.govt.nz/district-plan/>

District Plan Homepage, Greymouth District Council, <http://www.greydc.govt.nz/council-services/planning/district-plan/district-plan/>

District Plan Homepage, Marlborough District Council, <http://www.marlborough.govt.nz/Your-Council/RMA/Wairau-Awatere-Resource-Management-Plan.aspx>

District Plan Homepage, Masterton District Council, <http://www.mstn.govt.nz/planning/combinedplan/index.php>

District Plan Homepage, Palmerston North District Council, <http://www.pncc.govt.nz/AtoZofServices/Detail.aspx?id=1676>

District Plan Homepage, Rotorua District Council, <http://www.rdc.govt.nz/YourCouncil/CouncilDocuments/Dis->

trictPlan.aspx

District Plan Homepage, Timaru District Council, <http://www.timaru.govt.nz/district-plan-online.html>

District Plan Homepage, Waitaki District Council, <http://www.waitaki.govt.nz/Services/Planning/District+Plan.htm>

District Plan Homepage, Wanganui District Council, <http://www.wanganui.govt.nz/publications/plans/WEB%20DP/Textindex.html>

District Plan Homepage, Whangarei District Council, <http://www.wdc.govt.nz/customerservice/?lc=reader&m=t&i=223>

Harbourside Landscape Design Strategy, Oamaru, Dougal Armour 2008, <http://www.waitaki.govt.nz/NR/rdon-lyres/F4D4DBF8-738F-4CD7-A898-102CC642D020/55941/harbourside.pdf>

The History and Future of Rail in New Zealand, David Heatley 2009, <http://www.iscr.org.nz/n511.html>

Urban Design Compendium, English Partnerships & Housing Corporation 2007, <http://www.urbandesigncompendium.co.uk>

Urban Design Toolkit, <http://www.mfe.govt.nz/publications/urban/urban-toolkit-2009/urban-design-toolkit-third-edition.pdf>

Urban Design Protocol, <http://www.mfe.govt.nz/publications/urban/design-protocol-mar05/urban-design-protocol-bw.pdf>