Adaptive Reuse and Repurposing of Industrial Buildings to Residential Dwellings in Auckland City

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Abstract: Auckland is currently facing a housing crisis in which demand for living space has exceeded what is being provided. The ad hoc demolition of older buildings, driven by proactive property developers in hope of meeting the ever-increasing housing demand, often does not take into consideration the economic, environmental and social benefits that existing buildings can offer. Auckland City has at its disposal existing building stock that is often underutilised, with building owners usually opting for demolition as opposed to adaptation, due to a stigma attached that it is both a complicated and costly process. The study utilises a case study approach that focuses on a conversion project, the Ford Factory Lofts, situated in Parnell, one of Auckland' s CBD fringe areas. Semi-structured in-depth interviews were carried out with the property developer, architect, structural engineer, planner and marketing manager. Fieldwork and documentary research complemented the interviews with the aim to understand the potential that adaptive reuse has in the context of Auckland City. The findings indicate that for a developer to consider adaptive reuse as a viable alternative to demolition, a clear set of financial incentives must be identified. Although the undertaking was not attractive in terms of cost and risk related to buildability, marketability and the potential for return on investment played an important role and ultimately validated the process, allowing the developer to capitalise on the building's character. Other drivers, associated with sustainable building practices, were not considered and were instead a bi-product of the adaptive reuse process.

Keywords: adaptive reuse; industrial buildings; urban regeneration; Ford Lofts; Parnell

1. Introduction

Adaptive reuse is described as a process which changes or modifies a disused building and repurposes it while retaining its cultural heritage value (Australian Government Department of the Environment and Heritage, 2004; Buildings Department Hong Kong, 2012; ICOMOS New Zealand, 2010). Adaptive reuse of buildings is often seen as a viable alternative to demolition. Various studies in the literature examine building adaptation as a juxtaposition of benefits (economic, environmental and social) and barriers (mainly structural and planning). The adaptive reuse of an existing building stock has been recognised as having a significant impact upon the built environment.

Although adaptive reuse has gained traction in Auckland in recent years, limited published research explores the potential of Auckland's existing building stock that is often underutilised, with building owners usually opting for demolition as opposed to adaptation. The practice of adaptive reuse attempts to shift this trend by assessing the adaptive reuse potential of existing buildings. While Auckland City has a growing demand for housing in respect to its ever-thriving population, adaptive reuse is often overlooked based on the stigma attached that it is both a complicated and costly process. Building conversion nowadays has been influenced by the ever-increasing demand for residential and commercial space (Douglas, 2006).

This study offers a multi-faceted approach which has been applied to the conversion of a former industrial building in Auckland's inner city into residential lofts, and provides an in-depth discussion of the implications of the stakeholders' multiple perspectives. Over the past few years, adaptive re-use has become a more attractive investment proposition for property developers and a prominent strategy in the redevelopment of Auckland's central and inner city. This paper provides policy makers and key decision makers with the underlying factors that need to be considered when implementing an adaptive re-use policy as part of their sustainability strategy.

2. Background

2.1 Economic benefits of adaptive reuse

Initial costs pertaining to adaptive reuse vary in relation to a number of factors that are often seen to be dependent on the circumstances of individual buildings. In this respect the actual costs related to adaptive reuse projects can be difficult to estimate during design stages and early development processes, especially when compared to traditional demolish and rebuild projects (Bullen & Love, 2010; Bullen & Love 2011; Love, Dyson & Matthews, 2016). Although there is evidence in the literature, such as past projects and case studies, that adaptive reuse can potentially offer cost savings, there are also contrasting viewpoints arguing that adaptive reuse will incur added cost to

projects when compared with the option of demolition and reconstruction (Bullen & Love, 2011; Love et al., 2016). For this reason, building owners may be reluctant to consider adaptive reuse as a viable alternative to demolition due to the perception that adaptive reuse will be costlier to undertake. Studies have shown that adaptation costs can surpass those of a new build of similar nature and design. This is particularly evident for buildings that are complex in design or construction methodology, or have specific requirements relating to listing or legislation (Wilkinson et al., 2009). Often due to the big volume and complicated structure of some factory buildings, demolition costs are higher than those for reconstruction (Wang & Zeng, 2010).

Additional factors that can cause cost overrun may involve the current state of material and long-term associated maintenance costs (Bullen & Love, 2010), procurement of correct and matching materials, and finding well-trained tradesmen who are not only willing to undertake potentially high-risk work, but also possess the required skillset to undertake the work (Bullen & Love, 2011). Furthermore, if extensive strengthening of a building's structure is required, the project will almost certainly be deemed uneconomical (Bullen & Love, 2010). The ongoing maintenance costs of an adaptive reuse project would usually be higher than a new-build project as buildings age over time (Bullen & Love, 2010; Douglas, 2006).

However, as costs to demolish and construct new buildings gradually rises, this perception of cost imbalance appears to be reversing, and adaptation is becoming an economic contender to the traditional process of demolition and rebuild (Bullen & Love, 2011). Cost savings can be achieved in a number of ways including - extending a building's useful life, ultimately saving costs that would have been directed towards materials, transport, energy, and pollution (Bullen & Love, 2009; Schittich, 2003) and limiting the overall construction period, eliminating the need for demolition (Ball, 2002; Douglas, 2006; Langston, Wong, Hui, & Shen, 2007; Love et al., 2016; Tooley, 2011; Wilkinson et al., 2009). Embodied energy savings resulting from retaining the building become especially relevant in the light of future rising energy costs (Australian Government Department of the Environment and Heritage, 2004). Adaptive reuse could also be considered as a greater employment generator in comparison to new construction. Refurbishments, which typically involve labour-intensive activities, require 25% more employment per square meter of floor area than new builds (Langston et al., 2007).

2.2 Environmental benefits of adaptive reuse

With growing awareness of global warming and how the construction industry contributes to it in the way of CO2 emissions and material waste, one technique for addressing this issue concerns adaptive reuse and how sustainable design can be incorporated to mitigate demolition waste and lean energy consumption overall (Boschmann & Gabriel, 2013; Conejos et al., 2015). The existing building stock has the greatest potential to lower the environmental load significantly within the next 20 to 30 years (Rovers, 2004). As buildings appreciate over time, their operational and commercial performance will gradually decrease and eventually fall below owner/occupier expectations causing issues in relation to maintenance. Built stock thus becomes redundant over time and the decision to demolish or adapt becomes an issue many owners, developers, designers, and planners need to address (Bullen & Love, 2010). The consequences of demolition need to be considered as demolition waste is a key contributing factor when assessing emissions on the environment in the context of the construction industry (Boschmann & Gabriel, 2013).

The benefits of adaptive reuse in the context of environmental sustainability are well known (Bullen & Love, 2010), and play a major role in the sustainable development of communities, helping to maintain the social fabric and eliminate demolition waste (Conejos et al., 2012). Existing buildings contain a large amount of embodied energy that can be utilised through adaptive reuse and therefore reduce the need for additional construction materials and processes that would otherwise be lost in demolition (Conejos et al., 2012). This offers a sustainable alternative to the traditional process of demolishing an old building that no longer meets its operating requirements, instead extending its life (Conejos et al., 2012), and ultimately reducing waste whilst preserving the building's original aesthetic and footprint (Boschmann & Gabriel, 2013).

There is an agreement in the literature that adaption, as opposed to demolition, can make a considerable contribution to sustainability through reduced material requirements, less need for transport, and lower energy consumption (Bullen & Love, 2010). Adapting existing buildings and upgrading systems to reduce greenhouse gas emissions is seen as a more climate friendly strategy compared with producing a new building that has been designed with sustainability in mind from the outset (Conejos et al., 2012). Access to new technology and cheap energy has essentially divorced construction from its intended geography (Boschmann & Gabriel, 2013) and caused for building

design to often be based on economic reasoning rather than environmentally-informed construction (Boschmann & Gabriel, 2013). Existing building stock offers insight to sustainable practice through low-technology approaches such as cross-ventilation, openable windows, extensive use of glazing, and awnings to mitigate solar heat gain, which potentially eliminate the need for energy consuming technologies (Boschmann & Gabriel, 2013).

2.3 Social benefits of adaptive reuse

When contemplating the decision to demolish or adapt an existing building, there often exists a component of sentimental value that can be interpreted as a social factor (Sfakianaki & Moutsatsou, 2015) that considers values attached to the building in terms of style and character (Bullen & Love, 2010). Adaption helps to retain this important social and cultural capital that is embodied within the building (Wilkinson et al., 2009) and gives, both tourists and local community members alike, a glimpse into the past, helping to describe regional identity (Remoy & Wilkinson, 2012). It has been often found that the success of building adaption has a direct relationship with the retention of a building's character and historical significance (Bullen & Love, 2011; Love et al., 2016).

Communities that actively incorporate adaptive reuse programs into their existing stock will have a stronger connection to both local culture and the built environment. This is especially apparent when buildings have heritage values (Bullen & Love, 2011). Adaptive reuse helps to improve quality of life (Bullen & Love, 2011) as it works to rehabilitate neglected areas, ultimately increasing the living standards within a community (Love et al., 2016). Building adaption leads to economic growth (Love et al., 2016) thus increasing population density and inhibiting the use of private transport (Bullen & Love, 2011). It has also been argued however that, in certain instances, adaptive reuse can supress increases in urban density, as existing buildings will be restricted to their current size (Love et al., 2016). Building owners need to consider important items relating to building comfort and health and safety, including indoor air quality, thermal and acoustic performance requirements (Wilkinson et al., 2009), services relating to disabled access, and fire safety (Bullen & Love, 2010). Regardless of the social benefits that adaptation offers, selection processes at the feasibility stage of projects may not consider the social factor of adaptive reuse, resulting in demolition based upon a rushed analysis of adaptive potential (Wilkinson et al., 2009).

2.4 Critical factors and drivers influencing decision-making in adaptive reuse

Critical factors and key drivers that influence adaptive reuse vary depending on a number of circumstances that a building may have. While adaptive reuse in developing countries is motivated by resource constraints and economical sustainability, in developed nations, there may be a number of factors that contribute including, environmental awareness (Siddiq & Thomas, 2006; Wilkinson et al., 2009), economical reasoning, and social influence to name a few (Remoy & Wilkinson, 2012).

A number of factors have been identified to drive the decision of adaptive reuse. A key driver has been rising energy costs for new construction, forcing building owners to seek alternative methods of achieving their goals through adapting existing building stock (Bullen & Love, 2011). Building location is considered to be an important factor to adaptation as it relates to the accessibility of the building in terms of available public transport, nearby facilities, and social mixing grounds (Wilkinson et al., 2009). A building's physical state requires critical analysis in terms of available space, flexibility to adapt, structural integrity, welfare of the building fabric, and potential for future maintenance (Bullen & Love, 2011). Based on whether these criteria can be easily met, adaptation may not be suitable as additional construction costs may exceed budget (Bullen & Love, 2011). In some cases however, even when economic costs are higher than expected, environmental and social benefits may outweigh the cost factor and prompt the decision to adapt (Siddiq & Thomas, 2006). Key issues that need to be addressed and identified in the decision making process include significance to culture and heritage, technical and economic challenges, and implications on environmental sustainability (Bullen, 2007). More specifically the key drivers for adoption of adaptive reuse include: increased building life, lower material, transport, and energy consumption, reduced resource consumption and material waste, less disruption and financial incentives (Love et al., 2016).

In order for adaptive reuse programs to gain traction within communities, the use of incentives can assist in the different processes that adaptation faces when compared to traditional demolish and re-build alternatives. The use of subsidies and incentives give building owners and developers the confidence to adapt their buildings, in some cases serving to help mitigate urban decay in problematic areas (Bullen & Love, 2011). Government agencies are considered to be prime candidates to enforce adaptive reuse programs as they often have large portfolios of available building stock, can offer financial incentives, can modify legislation to be more lenient in respect to adaptive reuse projects, and can more efficiently adopt comprehensive screening processes to determine building suitability

(Bullen & Love, 2011). Financial incentives may be necessary in certain markets so that to portray adaptive reuse as an attractive alternative and form a favourable business case for developers (Wilkinson et al., 2009).

3. Research approach

A case study research was considered most appropriate as it offered a multi-faceted approach to the research investigation. The case study is a preferred strategy when the focus is on a contemporary phenomenon within a real life context (Burns, 2000). The Ford Factory Lofts, located at 28 York Street in Parnell, are a three storey brick and concrete structure originally built as an assembly factory for Model-T Ford cars in 1915. In recent years, the building has been acquired by a property developer whose interest in the property's history has led him to retain much of the existing structure thus transforming the historic Ford factory into character lofts. The eight bespoke apartments that embody the character of early 1900's architecture are a unique combination of old and new.

Multiple sources of empirical evidence, such as semi-structured interviews, fieldwork and documentary research, were the chosen data collection methods within the case study. The purpose of combining these different methods was to gain in-depth understanding of the conversion of this large former industrial building in the specific Auckland context and examine the study's research topic from different perspectives. Conducting participant observations in conjunction with interviewing and document analysis allows for the triangulation and substantiation of the findings (Merriam, 2009). The use of such multiple sources of evidence and a variety of types of data are a major strength of the case study approach (Burns, 2000; Cavana et al., 2001; Denscombe, 2010). The collected qualitative data painted a richer picture of the area's historical background, socio-economic profile and character building stock which would not have been possible if interviews had been used as a sole method.

3.1 Documentary research

The documentary research was considered alongside fieldwork and interviews to provide data on the Lofts' area and describe a richer contextual setting. The Ford Factory Lofts' historical background was produced as a result of a mixture of text-based and image-based documentary sources: academic literature, professional magazine articles and web sources, and historical photographs. Furthermore, the documentary research focused on: the architectural drawings; zoning requirements and property information from Auckland Council; and a search of the New Zealand Historic Places Trust (NZHPT) register. A specifically designed document analysis framework was used to help the research investigation.

3.2 Fieldwork in Parnell

A number of site visits were undertaken at the Ford Factory lofts in 2016 when the demolition was underway on parts of the building that could not be preserved. On-site photographs were taken with the aim to gain a more in-depth understanding of the conversion process. Furthermore, direct comparisons were made between images of the original building and the proposed transformation.

3.3 Semi-structured interviews

Semi-structured, face-to-face, in-depth interviews were the major method of empirical data collection and followed the documentary research and fieldwork at the Ford Factory Lofts. The main objective of the interviews was to explore the key areas of consideration involved in this adaptive reuse development. The additional information revealed through the interviews provided new dimensions to the research problem which were not obvious at the fieldwork and document analysis phases. Five different sets of questions guided the semi-structured interviews with the property developer, project architect, structural engineer, urban planner from Auckland Council and a marketing manager for the apartments. Data obtained from the interview with the property developer was useful for investigating their investment motives and the financial considerations in such building conversions. The interview with the marketing manager supplied data on the market conditions and demand. Data gathered from the remaining interviews was essential to uncover the design considerations - architectural, structural and planning, associated with such conversions.

4. Findings and discussion

4.1 Building profile and historical background

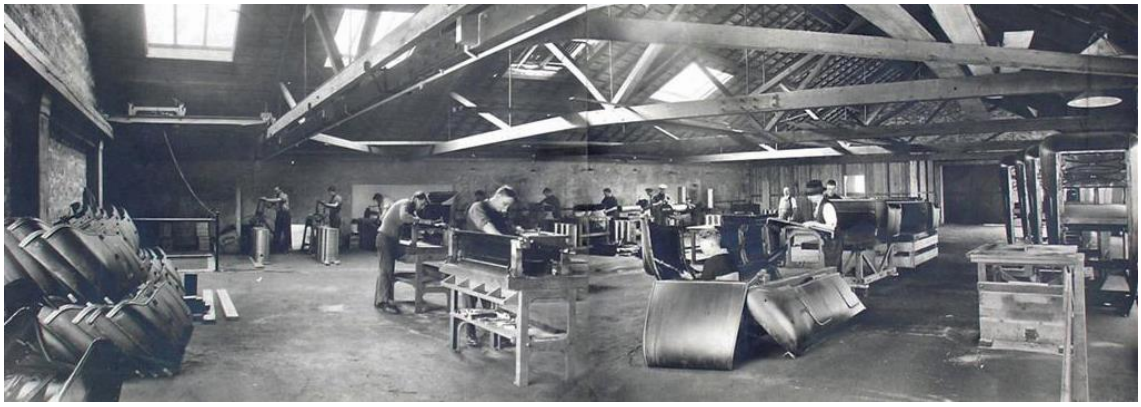
The designer loft apartments in York Street, Parnell, are a character development in one of Auckland's most affluent areas located on the eastern side of the CBD. The Ford Factory, situated on a large piece of land of 1,904m2, was built over a century ago with the purpose to produce Model T Ford

Motor vehicles. They arrived pre-assembled and packed in individual wooden cases which were then distributed to various dealers who attached the wheels, windscreen and hood. In 1924, the building was extended in order to accommodate a complete assembly line for the Model-T on site. The factory was subsequently equipped with the latest technology similarly to the assembly line methods in Ford's Michigan factory. A ramp, located at the back of the building, allowed the finished vehicles to be driven out of the factory and sent directly to the market. At its peak, when the factory completed a Model T every 20 minutes, it employed up to 250 men. By 1936, the Ford Company of New Zealand built a central assembly plant in Lower Hutt, consequently making 28 York Street redundant and causing work to cease (Hawkes, 2015). Since then, the building has been left all but dormant, used as a storage warehouse and parking lot for various companies.

Figure 1: The Ford Factory dated 1915 as viewed from Fox Street, Parnell
(Hawkes, 2015)

Figure 2: Ford Factory dated 1915 as viewed from Dilworth Terrace
(Hawkes, 2015)

Figure 3: Ford Factory assembly floor dated 1915
(Hawkes, 2015)



In 2015, Gosling Property Group who acquired the property, commissioned the award-winning architectural firm, Cheshire Architects. As a result of the close collaboration, the original Model T Ford assembly plant was transformed into just eight character loft apartments. The bespoke interiors are a sophisticated blend of the original building's exposed brick face, hand oiled timber, copper roofing, robust concrete and lacquered metal with new materials, such as steel window joinery throughout. The interior design of Ford Lofts aimed to capitalise on the distinct characteristics of the former Model T Ford factory building to ensure apartments are unique (CBC Construction, 2016). Although the Ford factory may be considered as part of Parnell's history, the building is not listed as a historical building on the NZHPT (New Zealand Historic Places Trust) register. As such, the property developer was not under any obligation to preserve any of the building's existing features.

Figure 4: Rendering of proposed Lofts as viewed from the courtyard
(Hawkes, 2015)

Figure 5*:* Rendering of intended internal space
(Hawkes, 2015)

Prior to the development, the capital value of the property was $4 million, $3.6 million of which was the value of the land. The Ford Factory itself was only worth $400,000. The approximate project value was

$6.5 million (CBC Construction, 2016). After the development, the increase in property value was significant with the exclusive three-bedroom Ford Lofts marketed for over $1,695,000 each. These high asking prices can be explained with the rising popularity in apartment living in the city fringe areas. Key factors contributing to this trend are: greater emphasis on convenient lifestyles, demographic shifts of the baby-booming downsizers and better public transport (Collier International, 2016). Current rates for new apartments in Auckland's CBD are approximately $10,540/m2, and $10,200/m2 for city fringe areas. Converted industrial buildings are especially in demand with a vacancy rate of only 2.2% spread across Auckland's main industrial precincts (Collier International, 2016).

4.2 Incentives and drivers of adaptive reuse for property developers

For a developer to consider adaptive reuse as a viable alternative to demolition, key incentives and drivers must be identified. The property developer for the Ford Lofts did not originally set out looking for an adaptive reuse project, and came across the building by chance, ultimately purchasing it based on the area it is situated. Although this land could have been re-developed completely at a lower cost to adaption, the forecasted profit is still substantial. As the property's historical relevance became clear, a unique design was developed determined by the parts of the structure that could be recycled. The combination of these unique attributes and the current demand for inner city living in Auckland, put the Ford Lofts in a strong position in terms of both, marketability and potential for return on investment. In this way opportunity arose for marketing the lofts as bespoke apartments set in a century old factory, offering a unique opportunity to buyers in this affluent area (Developer, 2016). In terms of financial return, a net gain relative to cost of approximately 40-45% is expected by the end of the project. The developer estimates that the selling price per meter squared of living space will likely end up in the range of $15,000 – $20,000, depending on the loft (Developer, 2016). This finding is consistent with similar studies in the literature that observed adaptive reuse projects generating substantial increases in property value when compared to newer buildings in the same areas (Bullen & Love, 2009; Wilkinson et al.,2009).

Environmental sustainability was not a key focus for the developer of the Ford Lofts as the budget could only accommodate certain aspects of the design. However, because the building recycles some of the structure and brickwork, it invariably reduces the amount of waste after demolition, and the amount of materials required for construction. Bullen & Love (2010) identify that there is a limit to what can be preserved, and that the current state of the building determines the parameters of such retention. In this case, the property developer opted to retain only what would add to the historical tone of the building such as the brickwork façade and some of the structure. This saw a lot of the building needing to be demolished and replaced either with completely new materials or recycled materials sourced elsewhere. These requirements placed the Ford Lofts in a position in which it was ultimately more expensive to adapt as opposed to demolish. In this way, a collaborative approach between the design team and developer helped to retain what was permissible, but in comparison to other projects, did not offer much in terms of preservation.

In terms of cost and risk related to buildability, the undertaking was not attractive by any means, however the unique features of the building were identified as potential key selling points when compared to conventional apartments. In the case of the Ford Factory Lofts, marketability played an important role and ultimately validated the process, allowing the developer to capitalise on the building's character. Love et al. (2016) identify a number of key drivers for property developers - increased building life; lower material, transport, and energy consumption; reduced resource consumption; less material waste; less disruption; and financial incentives. These drivers, aside from the financial aspect, were not considered by the property developer, and were instead a bi-product of the adaptive reuse process.

4.3 Design considerations involved in adaptive reuse

In terms of the design, there were a number of considerations, causing for a close working relationship between the structural engineer and the architect. The building's layout limited the design team in many ways. As the building is one hundred years old, very little of the existing structure could be preserved. By forcing the architect to work within the parameters of four existing walls, the architect needed to identify what key features of the building could be retained and how liveable spaces could be created in a way that complemented the existing structure (Architect, 2016).

According to both the architect and engineer, seismic and structural upgrades posed the most significant challenge, as the scope included a full upgrade in all areas in order to gain consent approval. The existing slab and walls of the building needed comprehensive strengthening, while both,

the façade and structural components needed to be re-built in order to bring the building up to code. In this case, the total budget was estimated at almost twice the cost when compared to a traditional build of similar size and function. However, according to the developer, it was a risk that was determined by the behaviour of the real estate market. Favourably, cost overrun was a risk that was assessed and mitigated during the feasibility and design stages, with contingencies made for structural strengthening, consent approval, and services requirements.

The required structural upgrades affected the aesthetics of the lofts. Every piece of structural steel needed to be absolutely necessary to the upgrades as the majority of it would be exposed. This concern was voiced mainly by the architect who did not want to overwhelm the existing brickwork with steel members (Architect, 2016; Engineer, 2016). In addition to this, the building's original purpose meant that it was not designed to be lived in, and therefore the design team needed to find alternative ways to comply with building codes. The structural integrity of an existing building has a considerable effect on whether the building can be adapted at all, and in cases where extensive strengthening of the foundation and walls needs to be undertaken, a sizable provision for the additional cost must be in place (Bullen & Love, 2010).

Since the lofts are located in the Parnell corridor, acoustic compliance was essential for making the lofts liveable. In this way the building needs to operate in a closed environment whilst keeping occupants comfortable and allowing for interior airflow. This meant that HVAC systems needed to be incorporated into each loft (Architect, 2016; Developer, 2016).
As six of the eight lofts were sold prior to confirmation of final design, each buyer was given the opportunity to offer design input for how they wanted to personalise the layout of each space to fit their preferences. This was a valuable exercise for both the future residents and the design team, however meant that services needed to be re-routed on each level, meaning that any potential for design efficiency was essentially made obsolete (Architect, 2016).

The Ford Lofts are very limited in relation to views and direct sunlight as they are positioned in the centre of four buildings. In order to make up for these lost features, open living has been designed, so as to create comfortable spaces that do not confine occupants (Architect, 2016). Access has also been a major consideration. However, since the building is only small in scale, it does not need to comply with the strict access codes a large scale apartment block would normally need to. This has allowed the design team to work within restrictions such as narrow hallways in areas of the building. Because the majority of buyers have expressed their intention to use these spaces in the long-term, a service lift has been incorporated to accommodate elderly or physically impaired individuals (Architect, 2016; Planner, 2016). The points of concern encountered by the design team of the Ford Lofts have been identified in the literature as technical challenges, such as, floor to ceiling height requirements; condition of the building's structure and fabrics; internal layout of rooms and services; acoustic separation and compliance; fire safety; and disabled access (Wilkinson et al., 2009).

4.4 Key factors contributing to the attractiveness of former industrial buildings to potential buyers

There were a number of factors that attracted buyers to this particular building. Key attributes emphasised its uniqueness, such as its past history, and what has been done in order to retain its character. It was expressed by both the developer and the marketing manager, that buyers were intrigued by the process and impressed by the extent the developer was willing to go to in order to preserve the original structure. It was also found that buyers were not only able to access the building in its original state, but were also given the opportunity to speak with the design team and alter the layout of their lofts to suit their lifestyle. This was an especially significant feature for one buyer who purchased two separate lofts and merged them into a single apartment suitable for family living. From a design standpoint, the lofts offer a very individual experience for their occupants, letting them live in a building that is over a century old, while allowing them to experience high end living within Auckland's business district. In this way, the building essentially markets itself, taking pressure off of both the developer and the marketing team (Marketing Manager, 2016).

The Ford Lofts project was by no means an easy undertaking, and did not take the logical path in terms of economic gain. The property developer did however, see opportunity in the marketability aspect of the building, and made an assessment based on what the building's historic nature could offer to both the space and the community. In this way the project has gained traction in the media and selling the majority of the lofts for their asking prices off of plans and artist impressions was effortless (Developer, 2016; Marketing Manager, 2016).

The way these lofts were marketed, highlighted the features that make them unique. The brickwork façade and exposed rafters emphasise the building's previous function, while new hi-spec finishes bring the building into the 21st century (Architect, 2016). Buyers were intrigued by this development as each loft offered an individual experience, tailored with exceptional detail that works in harmony with the existing structure, whilst honouring the building's past. For buyers, this was a long-term investment, not a strategic purchase for short-term gain (Marketing Manager, 2016).

These lofts were found to be very popular within the market. Potential buyers appeared to focus on the historical value of the previous structure, and how the architect proposed to dignify the character of the Ford Factory. The majority of buyers were made up of baby-boomers who wanted to use their loft space as a second home or entertainment space for their activities based closer to Auckland's CBD (Marketing Manager, 2016). As the Ford Lofts are not on display to the public, and essentially hidden, much of the general public were actually unaware of the building's initial purpose or history. Upon unveiling the plans however, social response to the preservation efforts of the developer have been positive, with a general interest in the project's outcome (Developer, 2016). Through preserving the building's character, the developer and construction team have ultimately made use of a very unique opportunity.

A prime location was also a significant factor that attracted buyers. The building is located in the Parnell corridor, in the centre of the Parnell village, and is close to Auckland's CBD. If a building such as this was built further out in, for example South Auckland, it would be unlikely that it would have been a profitable undertaking, as construction costs would have been similar, but demand would be far less (Developer, 2016). Compared with similar apartment buildings in the area, these lofts may potentially sell for 70% more compared to Auckland CBD and Auckland fringe apartments (Colliers International, 2016).

5 Conclusions

This research investigated the key areas of consideration involved in the conversion of a former factory into character loft apartments in Auckland's CBD fringe. The adaptive reuse project's economic value was the main driver for the private property owners/developers. Social and environment benefits were secondary and of less importance to them. They became a bi-product of the adaptive reuse process. Marketability and the potential for return on investment played a key role and far outweighed the cost and risk related to buildability. The developer capitalised on the building's history and unique character for financial gain. The study also revealed that the bespoke apartments in this affluent area of Auckland's inner city attracted predominantly baby-boomers who were interested in long holding periods.

Converting an industrial building into residential apartments can be a very complicated process as they have very different requirements in terms of form and function. Identifying an industrial building that can be successfully adapted from a warehouse structure into comfortable living spaces requires a building that is in a suitable location, has some sort of distinct character or history, and can be converted according to a reasonable budget. These requirements are directly related to how the building budget is structured and the marketing approach taken in order to make a profit for the developer. The budget for adaptation projects will invariably differ depending on the circumstances of the building's original state and what is set as the design goal. In this way, both the design and construction need to be properly understood and scoped prior to making the decision to adapt. As Aucklanders are slowly getting more accustomed to the lifestyle that inner-city apartments offer, a gradual increase in the demand for apartment buildings can be noted. This puts projects such as the Ford Lofts in a good position for property developers and gives way to development opportunities in the near-future.

Auckland's CBD and inner city have a limited supply of former industrial buildings. Additionally, a very specific set of circumstances need to be in place for a developer to even consider altering a building's function and design so immensely. Moreover, a clear set of financial incentives need to be in place for property developers as building conversions are a complicated process that is generally undefined in terms of design and development cost. Notwithstanding these facts, it would be premature to discount the benefits these types of projects offer, and if done correctly, adaptive reuse can be a financially viable alternative to demolition and constructing anew.

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