Reviving the **block:**

the architectural refurbishment of post-war modernist social housing

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Alexander Jones was awarded the Byera Hadley Travelling Scholarship in 2016
Cover image: Matavai Tower, Waterloo, Sydney
Photo by Alexander Jones

Reviving the block: the architectural refurbishment of post-war modernist social housing

Modernism as a movement provided a frame work for governments, to not only provide mass housing, but provide utopias. While the idealism of modernist dreaming has long since faded, its continued legacy remains in aging structures of concrete and steel. The remnants of the ideology lie in towers that have harboured families, memories and homes.

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Introduction

Modernist social housing is at a critical junction in its history that could see the demolition of its egalitarian legacy. The movement's philosophy played an integral role in the provision of post-war government housing, however over the past three decades the consensus amongst politicians, media, and public has deemed modernist solutions a misstep in the provision of adequate, safe mass housing. Post-war estate architecture has become a symbol for economic disadvantage and social decay. With the current trends in increasing global population and urban densification, there lies an opportunity for architects to examine post-war social housing and see to the continuation of the modernist legacy.

Architectural refurbishment of state-owned dwellings is a recent development in the push to house an increasing population. From the 1950s to the 1980s Europe, America and Australia saw large swathes of government housing being built. Due to a multitude of factors these structures, many of whom were touted to last 100 years, have now fallen into disrepair. With government owned post-war development continuing to provide homes for a large number of people, a solution must be found to deal with an aging housing stock.

The following research project aims to outline and understand both the social and architectural impacts of social housing refurbishment. The retention of social housing buildings has far reaching consequences outside of built form. The architectural improvement of these buildings is a component of a larger narrative around the of role social housing in society and how we value its communities.

Through travels to successful refurbishment projects in Europe and interviews with the architects, a body of knowledge has been built as to the approaches and challenges of social housing retention. Each case study provides a key example of a modernist social housing refurbishment and specific architectural intervention sensitive to the context. The case studies have been selected on a specific criteria of exemplary architecture and benefit to the existing community.

Building upon the knowledge gained through research and travel, this research project then aims to apply the lessons learnt to a local context. With the Waterloo social housing estate in Sydney planned to undergo mass renewal, the state of social housing within the city is at a pivotal moment.

Currently there are three architectural management strategies to address modernist social housing, these are: maintain, refurbish or demolition/rebuild. The first portion of this study aims to compare and understand the impacts of refurbishment vs a demolition/rebuild. Architectural refurbishment can prove itself to be a viable solution when considering financial outcomes, environmental impact, cultural heritage, urban impacts and community health and retention. With the prevalence of neo-liberal agendas amongst Western governments, the debate and conversation surrounding social housing renewal has become highly politicised. Due to this, a bipartisan understanding of when and why refurbishment can result in better economic, environmental and social outcomes legitimises the case for refurbishment over demolition/rebuild. As there have been few large-scale social housing refurbishments in Australia, various case studies from Europe and the US provide examples of the

impacts of both refurbishment and demolition/rebuild. This understanding will help provide a framework for applications and viability of refurbishment schemes in an Australian context.

The means of realising an architectural refurbishment is often technically complex and arduous. The case studies in Europe provide examples of refurbishment methods, community engagement and architectural outcomes. Architectural interventions into modernist housing seek to improve and correct urban flaws within the design. By re-examining these buildings architects can redefine projects to better fit the human scale. Post examination of form and function of architecture can result in unification of old and new for the benefit of the user. Specific cases of social housing refurbishment have been chosen from the UK, France and the Netherlands to represent successful architectural interventions and building retention. Through interviews, photography, diagrams and writings each case study aims to define the impact the refurbishment had on the fabric of the building and the community.

When considering an Australian context, Sydney has a rich modernist architectural history, with that influence extending to the provision of social housing in the city. Waterloo housing estate is prominently featured within the inner-city skyline and home to Matavai and Taranga towers. With the site currently planned to undergo mass renewal under the NSW government, a case study of Matavai tower has been devised to consider the possibility of refurbishment. The previous criteria set for justification and means of refurbishment has provided a framework to understand whether the retention of the tower is viable. In conjunction with a viability study a design exercise of a refurbishment scheme has been devised for Matavai tower. The aim of the case study has be to provide an example of the potential of the building and the importance it could have to retain the current community and architectural legacy of modernism in Sydney.

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Refurbishment vs demolition/rebuild

The decisions whether to refurbish or demolish and rebuild modernist social housing towers is complex and at times subjective. Due to the highly politicised nature of the debate, the arguments for viability and positive impacts of a refurbishment over demolition/rebuild must be convincing. It is important that the implications of a refurbishment project are understood to contextualise the architecture and its benefits. The refurbished architectural outcomes could not exist without a full assessment of the impacts in relation to demolition/rebuild. The impacts of a refurbishment scheme can be assessed at an economic, environmental, urban, historical and social level.

When discussing the impacts of refurbishment relative to demolition, it is important to remember each case must be assessed at an individual level, with trends not providing sufficient basis for the adoption of either scheme. Common assessment criteria for refurbishment vs demolition includes stock condition and associated costs, estate popularity, design, socio-economic conditions, finance and capacity for/cost of rehousing locally. [1] While these assessment criteria may provide a framework they do not deal with all associated outcomes of a refurbishment or demolition such as environmental and social wellbeing. As the assessment criteria deals with both empirical and numerical data the decision often results in a compromise of different objectives and values. [2] With multiple vested interests within social housing, debates over which outcome is the most feasible can often become divisive.

Life spans are an important definition for the assessment of social housing buildings and associated retention or demolition. Life spans vary dependant on category and are implemented in models that measure building efficiency and critical junctions where refurbishment is no-longer favourable over demolition. UCL defines the various life spans used as follows:

Economic life: ends when the building is judged to no longer be the least expensive way of performing its function

Service life: ends when the building is judged to no longer perform as intended

Technological life: ends if the intended performance of a building is judged to be mismatched with what inhabitants or users expect

Design life is decided by a building owner/developer to guide engineers and assure investors and insurers about the quality that has been specified for the building and its equipment. [3]

The following comparisons of architectural management strategies do not encompass every impact of a refurbishment scheme, rather are a framework for understanding the different benefits and where a strategy would perform successfully.

Economic Viability:

The economic viability of a refurbishment scheme is sensitive to many different forces, including but not limited to supply chain and market dynamics, tenure types, municipality management capacity and access to finance and/or willingness to invest. [4]

Economic viability is often the foundation for the success of a refurbishment scheme, with multiple studies showing that refurbishments can be more economically viable than demolition/rebuilds. [5] Municipalities can stress economic feasibility when considering a building's retention, and fiscal responsibility provides a powerful argument when pushing for the refurbishment of a building. [6] Managing and assessment of the economic viability of a refurbishment scheme over a demolition and rebuild is highly complex. The typical cost indicators used in the assessment of estate housing are:

• Capital expenditures or CAPEX (the cost of fixed assets)
• Operational expenditures or OPEX (the costs of goods and services)
• Capital investment appraisal (understanding the value of an investment over time)

These categories present a universal model for the economic assessment of a building. [7] However the complexity of the calculations lies in the estimation of costs. Both demolition or refurbishment are complex tasks with budget estimations and long term spending reductions being assumptive due a wide range of variables and lack of statistical data for current models.

When considering expenditure models over time CIBSE writes ""the advantages [of capital investments into existing buildings] are difficult to evaluate financially, while the disadvantages are very easy to cost." [8] Refurbishment does not provide positive net profit immediately rather a reduction in hypothetical future investments such as energy consumption, maintenance costs or costs associated with switching to cheaper fuels. [9]

While the models for assessing the longevity of costings lack long term appraisal data, outcomes can still be drawn about the economic benefits of refurbishment. With multiple studies outlining the "unwanted environmental, social and economic impacts of demolition and conclude that life cycle extension by improvement, renovation and renewal is a better more sustainable solution." [10] With more social housing building being refurbished the costing models that quantify economic benefit will become more precise. Refurbishment is often justified as fiscally responsible due to its lower OPEX and ability to achieve similar ongoing energy consumption to that of a new build.

Budget considerations outlined in UCL's commissioned report "Demolition or Refurbishment of Social Housing?" are as follows:

• Markets and prices

  Land values are often a justification of the sale of public housing to private developers and the relocation of social housing away from the original site. This comparison of expenditure will only deal with same site constructions as the scope of the report does not ad-

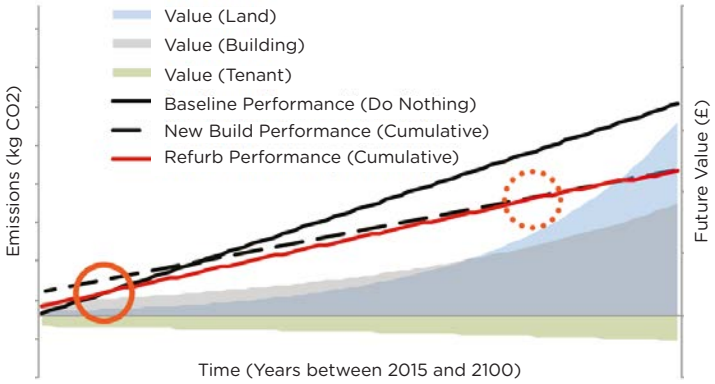


Figure 1:

Taken from UCL report "Demolish or Refurbishment of Social Housing? A review of the Evidence" 2014.". The graph shows the lower embodied energy of a refurbishment meaning a high performing refurbishment can take a long period of time before having a higher cumulative emissions and costs than a new build. The time emissions remain lower is dependent on the efficiency of the building post refurbishment.

dress with the private sale of public land.

The housing market is a large factor in the economic viability of a refurbishment over a demolition/rebuild. When considering a demolition/rebuild the possibility to increase revenue through larger apartment numbers and introduction of mixed tenure (private and public housing) is a large financial incentive. The higher CAPEX of a demolition and rebuild could be offset with an increased revenue stream. In a scenario where the value of the building and land rise faster than energy prices, the returns from investing in a demolition/rebuild, with increased apartment numbers and floor space available to sell or rent, will be significantly larger than the returns of an energy efficient refurbishment. [11] This scenario is dependent on the ability to provide more housing in the same area, which is site specific.

•Behaviour and performance

The energy performance of a building is a major consideration of the economic life of a building. With many post war constructions having poor insulation and heating systems, the increase in energy efficiency is important for the economic success of a refurbishment. The expenditure models for energy consumption rely on multiple variables including inflation, consumption, and energy pricing. With refurbishment schemes often gaining similar energy efficacy as new builds, the annual energy savings of a new build take a long period to offset the OPEX compared to a refurbishment. [12] See Figure 1 for a comparison of cumulative CO2 emissions and time of critical junctions in economic life.

• Maintenance and repair

The quality and condition of a building plays a large role in the financial viability of a refurbishment scheme. Buildings in sound condition with little foundational and structural damage often result in a favourable economic outcome for refurbishment over demolition/rebuild. Refurbishment falls under the category of preventive maintenance, decreasing possible expenditure with monitoring and statistical modelling of required upkeep for refurbishments increasingly sophisticated. [13] There is a possibility that older refurbished buildings may require additional maintenance over demolition/rebuild depending on the quality of build, service life, and refurbishment strategy. However this comparison is also dependant on the quality of new builds. Cumulative knowledge and technological advancements in refurbishment of modernist housing will also reduce required maintenance on finished schemes. [14]

• Environmental and project costs of waste disposal

When looking at project costs of waste disposal it is mostly applicable to demolition/rebuild schemes. The authors of a case study looking at the renewal of Clapham Park Estate noting that it was "impossible to obtain accurate information regarding the impacts and costs of the demolition phase of the rebuilding scenario, however as the results are already clearly in favour of refurbishment, additional cost, embodied energy and carbon are likely to have further confirmed this conclusion" (15)

Item:	Cost:
Removals and storage for average 3-bed house	£2,000
Decant fit-out costs – including re-carpeting – new / relaid as necessary (new in lounge and dining room, following removal of chimney breast), also blinds, white goods etc	£3,000
Rent loss from "decant home" for 12 week decant period - £110/week for 3-bed house	£1,300
Resident costs (typically between £100-£500 per decant for services reconnection, post forwarding, etc)	£300
Inconvenience payment (under Radian decant policy)	£500
Resident Liaison Officer (approx £30k per annum averaged across 14 properties)	£2,100
Site office and presence office (averaged across 14 properties)	£800
Total:	£10,000

Figure 2:

Costs associated with decant of each household at Borough Grove. Each household was decanted for 9-12 weeks. Taken CAMCO 2011 Retrofit South East: Project Summary Report available from: http://www.radian.co.uk/abouts/sustainability/retrofit

• Delays in refurbishment and demolition works

As with any construction project budgeting for delays is required. While refurbishment works are less time consuming allowing for a smaller margin of error, the small number of completed refurbishments means associated supply chain logistics and the technical knowledge to complete the schemes is lacking, which could lead to larger delays in construction. New construction of buildings has a large body of knowledge to draw on to resolve delays.

• Decanting

Decanting is defined as the movement of residents into temporary housing while refurbishment or demolition/rebuilds works take place. Length of time required for the construction to be completed impact the expenditure of decanting. With refurbishment works often taking a shorter amount of time than demolition/rebuilds, decanting budgets for refurbishment schemes are much lower. Depending on the design, refurbishment schemes can be undertaken with no decant required, meaning only relatively small remuneration payments required for tenants. [16] A case study into decanting costs at Borough Grove can be seen in Figure 2

The economic viability of a scheme must be calculated on an individual basis, and while there are trends to suggest that refurbishment is often economically viable, it does not apply in all circumstances.

The decision whether to demolish or refurbish a building is marked by assumptions and projections on the life of a building. Depending on the category of expenditure, models range in time periods, from 5 years to 100 years. [17] The life expectancy of a building and modelling time frames impact critical thresholds for economic benefit to occur from refurbishment over demolition.

Environmental Sustainability:

Water:

Water consumption of a refurbishment is significantly lower than that of a demolition/rebuild. While the water consumption during construction is minimal, the water embodied in the extraction and manufacturing of building materials is considerable. As a refurbishment requires less new materials than demolition/rebuild less water is required.

Waste:

The environmental sustainability of refurbishment scheme is bolstered by the lower amount of waste created than a demolition/rebuild. Within the UK, construction and demolition waste is responsible for 33% of total waste each year, 19% of that a result of over-ordering for new construction. [18]

Refurbishment works result in less demolition waste to landfill and require less resources to complete particularly concrete, steel and brick.

Energy:

A key indicator for the environmental sustainability of a refurbishment scheme is the required energy use and associated greenhouse gas emissions measured in carbon output. The environmental case for refurbishment over the demolition/rebuild of social housing is strengthened through refurbishment works requiring lower carbon costs and the ability to improve energy consumption standards similar to that of a new build. A low carbon refurbishment can lead to the extension of the life-cycle of a building and a lower carbon output than the life-cycle of a new build.

Construction practices within refurbishment schemes that can increase the sustainability of an existing building include, insulation (cavity wall, solid wall, roof, loft and floor), higher performance windows and doors, improving air tightness, higher performance boilers and controls, communal heating systems, and energy efficient lighting and appliances. [19] While these deal with the fabric of a building there are also architectural interventions which can improve the energy efficiency of a building including winter gardens and thermal façade cladding.

The energy consumption of a building can be split into two categories, operation energy and embodied energy. Operational energy is defined as the ongoing energy requirements of a building, while embodied energy refers to energy used in the process of raw material extraction, transportation, construction, demolition and disposal. [20]

Modelling the amount of embodied energy required to construct a new building is difficult due to the complexity tracing all environmental impacts of building materials, transport requirements and fuels grades. Another difficulty of modelling the embodied energy of a building is the calculations for construction do not account for the energy costs of maintenance, altercations or replacements over the lifecycle of a building. [21]

The sustainability of a refurbishment scheme is based on its ability to perform at a rate in which life-cycle operational energy and carbon costs do not exceed operation and embodied carbon costs over the life-cycle of a new build. New buildings on average are more energy efficient, having lower operational carbon costs than already existing buildings. However with the addition of embodied carbon, a new more efficient building can have higher carbon costs over the life-cycle of a building when compared to a refurbished existing building. [22]

The length of time carbon savings are made from a refurbishment is dependent on the existing building's ability to achieve a high energy efficiency. To be considered a more sustainable solution the carbon savings must exceed the life-cycle of a new build. As seen in Figure 1, while the refurbished building has a higher operational carbon output, the lower embodied carbon means it can take many years before a pay-off is seen. In addition to this as more renewable fuel sources are adopted, the energy efficiency of a building will become less important. [23]

The German Zukunft Haus Pilot Program

Completed from 2003-2005 the program included the renovation of 34 pre-1978 apartment blocks across East and West Germany. The renovation included insulated external and internal cladding, high quality glazing, efficient heating and energy systems, solar collectors for hot water, heat recovery mechanisms, and where possible southern facing balconies. These renovations resulted in energy consumption being reduced by 80% and the homes becoming twice as energy efficient as the current new build standard set by the German government. [24]

Wilmcote House, Portsmouth

The refurbishment of 3 modernist tower blocks in Portsmouth UK was aimed to deliver an improved standard of living for the tenants, extend the life of the building and reduce energy consumption. The refurbishment included, a new façade consisting of a steel frame exoskeleton that housed a heavily insulted, pitched roof and new cladding (this was required as the current structure could not hold an increased load), triple glazed windows and doors, mechanical ventilation and heat recovery, balconies and walkways being enclosed and secured, new well insulated hot water systems and showers with electrical heating retained. The results of the refurbishment are expected to be an 80% reduction in energy costs and the life expectancy of the building to increase by 30 years. Another result of the scheme was mould and condensation issues resolving, improving living standards for tenants. [25]

Community:

When assessing community outcomes, community engagement and empowerment are essential to ensure resident wellbeing. [26]

Community cohesion and retention are both impacted by the implementation of either refurbishment or demolition/rebuild options. While there is a gap in the statistical evidence base for the impact of both schemes, it is important to address possible outcomes refurbishment and demolition/rebuild may have to the social cohesion of an area. These outcomes can be difficult to measure due to the notion of community being inherently subjective and will vary from resident to resident. When considering established community unity the strongest case for the refurbishment of social housing would be the community retention rates.

There is conflicting evidence on the impact both refurbishment and demolition/rebuild have on perceptions of community. [27] [28] The outcomes of a scheme and its impact on community sentiment are dependent on the established community within area, feelings of safety, neighbourly behaviour, trust, and practical, financial, emotional and social support. [29] Due to the conflicting evidence it is not viable to make an assumption on either schemes effect on a community. However it has been proven that social wellbeing can be maintained by placing emphasis on community engagement. [30] Self-determination and community engagement are two important planning methods as to address the needs of residents.

While a trend line cannot be established for the schemes impact on community unity, there is evidence of low community retention in demolition/rebuild schemes. [31] [32] Community retention is the return of original tenants to the social housing estate which have been renewed. This report could find no instances of case studies directly dealing with community retention of refurbished social housing buildings. However there are case studies which suggest low retention rates of original residents post demolition/rebuild. [33] [34] The low rate of return to an area could be due to involuntary displacement [35] and/or an unwillingness for tenants to return due to a range of factors. [36]

Social cohesion is dependent on the perceptions of the established community within an area. While community retention is valued by some residents, it is important to note opinions on demolition/rebuild are not always seen as a negative amongst community members, with many seeing the re-location as a possibility for a new start. [37] Other influences on people re-settling away from an area include stigmatisation of an estate, personal networks, stress and logistics of moving and comfort in re-location. [38]

While there is no statistical evidence to conclude refurbishment results in higher community retention, the purpose and direct result of refurbishment is to provide improved apartments for current residents. The demolition/rebuild of an estate does not have the same direct correlation. An example of this is the London Decant Policy for Social Housing Tenants, which outlines the following rights for return: [39]

Name of Estate	Number of Social Housing Dwellings Demolished	Number of Social Housing Dwellings Built	Number of Original tenants to return
King's Crescent	357	79	N/A
Heygate Estate	1994	82	45
Ferrier Estate	1732	0	N/A
Woodberry Down Estate	1980	1088	N/A

Figure 3:

Table showing the number of social housing dwelling demolished in renewal schemes vs number of social housing dwelling built in their place and number of original tenants to return.

Modernisation and Refurbishment Schemes:

• retain the tenancy of their existing substantive home
• have the right to return to their substantive home upon completion of the work

Demolition and redevelopment schemes:

• in the case of demolition be offered suitable permanent alternative accommodation
• in the case of redevelopment schemes, either
  o be offered suitable permanent accommodation and retain the option of an offer of accommodation on the new scheme where possible
  o move permanently into one of the newly developed properties where suitable properties become available prior to the need to decant sites

Regarding refurbishment, there is no ambiguity as to the direct provision of housing in the same location. However there is ambiguity with the right to return to demolished and redeveloped schemes, accommodating the previous community "where possible." This definition of right to return is not universal, however is an example of the intentions of refurbishment to provide housing for the current community. While there is a lack of statistical evidence of the return of communities to refurbished social housing, there could be a possible indication of higher retention rate through examining the purpose of refurbishment schemes.

Involuntary displacement is the inability of a resident to return to an estate area due to lack of adequate housing or inability to afford housing within a demolished/rebuilt estate. The relocation of tenants away from centrally located positions to the outskirts of the city, with the "right to return" once renewal works have been completed is common practice. [40] There are multiple cases of social housing demolition/rebuild projects in the UK with the "right to return" to an estate area that have been impacted by the lower number of social housing dwellings rebuilt. (See Figure 3) In multiple major renewal programs the level of social housing rebuilt on the original site has decreased significantly, precluding people from moving back to the area in which the previously lived. [41] As of May 2014, 18 of 32 councils within London have signed deals with private developers for the wholesale demolition of existing social housing and replacement with mixed tenancy. [42] The reduction of social housing within a planned renewal of an estate area is often to accommodate a higher portion of private housing in a mixed tenancy scheme. [43]

When discussing the introduction of mixed tenancy a report by LSE Housing and Communities states "large-scale demolition has the potential to disrupt close knit and settled communities. Refurbishment works, on the contrary, can attract well-off new residents without necessarily displacing any of the existing residents." [44]

When considering demolition/rebuild a mechanism to mitigate community dispersal is a single decant. This is defined as the movement of people from the building that is to be demolished into a new building on site, where they will now be permanently housed. This removes the risk of involuntary displacement, re-settlement and stress from moving large distances, multiple times.

There have been few studies into the rates of community return in a European and Australian context, however there have been multiple studies looking at return rates in America. The following information is a summary of a broad study into Chicago housing renewals, titled "Mixed-income developments and low rates of return: insights from relocated public housing residents in Chicago." The study found the rates of return of original tenants to redeveloped mixed tenancy social housing to be less than 11%. In this particular instance 16,864 heads of household were asked to designate their relocation preferences, with almost 90% choosing to exercise their "right to return" to their previous location. The disparity in percentage of people that intended to return and percentage of people that did return was due to the personal networks, social stigma, impact and logistics of return and comfort in re-location. On top of these personal decisions not to return the Chicago Housing Association was heavily criticized for its handling of the relocation and return of residence, often losing contact with residents, movement of residents into racially segregated and poverty stricken areas and poor communication with residents. [45]

Urban Impacts:

Demolition/rebuild for the purposes of mixed tenancy introduction has been criticised by researchers as the ''state led'' gentrification of the inner city through the dispersal of social housing tenants to the suburban outskirts. [46] This preclusion of people from urban centres can result in the prevention of access to urban resources and "rights to the city." [47] The re-location of tenants can also result in the intensification of pockets of poverty within a city and can subject residents to social exclusion. [48]

It is important to note that the re-location of tenants does not always result in their displacement to areas of poverty. However as outlined previously, demolition/rebuild schemes often result in low community retention rates, which can lead to residents residing in areas of spatial exclusion. Demolition/rebuild runs a higher risk of tenant displacement than refurbishment schemes as the direct outcome for a refurbishment scheme is for tenants to reside in the same location. [49]

An example of tenants relocating to areas of disadvantage due to a demolition/rebuild scheme can be seen in the Chicago case study. The intervention resulted in a portion of residents being re-located to areas of high poverty, racial segregation or public housing units in buildings and developments in as bad physical condition as the ones they were leaving. [50] With low community retention rates, many non-returning tenants settled in high poverty areas, possibly leading to a decrease potential of social mobility. [51] When surveyed 50% of non-returning respondents had felt like they had not made the

Figure 4:

Relocation pattern of lease holders from Heygate Estate within London and the corresponding property prices of the boroughs. Property data simplified from infographic by deliveryquotecompare.com. Source of property data for original infographic taken from the Land Registry, the London Development Database, and the Department for Communities and Local Government. Lease holder re-location data simplified from online map "Heygate Leaseholders Displacement Map" at heygatewashome.com. Source of re-location data obtained from Southwark Council during Heygate estate Compulsory Purchase Order Public Inquiry - Feb 2013.

right choice in choosing their re-located housing. [52]

The lack of services in disadvantaged areas and higher proportion of services in central positions, due to competitive advantage, can limit opportunities for residents of poor areas. [53] The removal of tenants away from centrally located housing and resources within a city could result in spatial inequality.
Spatial inequality is an urban pattern which precludes people from access to resources due to geographical location. Spatial inequality can further entrench poverty within areas of a city [54] impacting social cohesion and can lead to social exclusion. [55] Spatial inequalities are introduced to a city with increased influences of economic globalisation, capital and labour flexibility as well as welfare restructuring. [56] Welfare restructuring within the context of social housing can mean renewal programs to introduce mixed tenancy to government owned housing. Spatial inequality disallows people access to employment opportunities, transport, and private and government services. [57]

An example of the urban spatial impacts that demolition/rebuild decanting can have on a community is the Heygate Renewal Scheme in London. Looking at patterns of displacement and dispersal a 2013 case study done on the renewal scheme at Heygate London established the decentralisation of tenants. Figure 4 displays the re-location of long term lease holders of apartments within the estate. Low compensation for their apartments priced lease holders out of the city and resulted in their movement to less affluent urban outskirts. The movement of the majority of leaseholders directly correlates with the housing price of an area. The demolition and rebuild of the estate was planned to have 1197 new socially rented houses, however resulted in only 90 being build, 45 of those going to previous residents of the estate. With 63% of Heygate residents expressing a desire to remain within estate grounds, only 1 in 5 secure tenants remained in the SE17 postcode. [58]

Spatial inequality is a risk of a demolition/rebuild however not always a direct result. A case study looking at non-returning re-located tenants in New York Hope VI Program found 40% of re-located tenants now living in low poverty areas. This is a 40% net improvement and represents substantial progress. However the program was not a total success with 40% of non-returning residents still residing in high poverty areas. [59]

Mental and Physical Health:

The mental and physical health of residents is an important factor to consider when deliberating between a refurbishment or demolition/rebuild of social housing. Mental and physical well-being is broad and dependent on many influences, including access to health care and demographics of estates. There is data to suggest refurbishment leads to less mental and associated physical health issues than a demolition/rebuild. There is conflicting evidence as to the extent demolition/rebuild can affect residents health and well-being. (60)

There have been difficulties understanding the long-term impact of both schemes due to many of the case studies being conducted over short periods. There is a possibility of both positive and negative long-term health impacts from renewal that cannot be outlined, including improved health in future generations.

Due to the complexity and variables associated with demolition/rebuild, including single or double decants, length of re-location time, re-location areas and community engagement levels, the full health impacts of the scheme are not clear. There are varied reports concluding both improvement and decline in resident's health post demolition/rebuild. (61) (62) The decreased mental health of residents can be tied to the loss of community and social ties, stress associated with moving homes and the disruption and loss of place. (63)

One study of a demolition/rebuild scheme of a Carlton Housing Estate in Melbourne, Australia concluding an improvement in overall mental health and well-being for returning residents to rebuilt estate grounds. There were improvements of feelings of safety and image of the area, instilling a sense of pride in where they live. However, the study also a reported a deterioration of mental health for residents who were resettled off the estate. The reasons cited for not returning were long wait times due to construction and incompatible housing offered on the new estate, leading to resettlement. (64)

A common factor cited for the improved health of residents in refurbished buildings is the enhanced energy efficiency and insulation, improving the warmth of the buildings. (65) Refurbishment schemes can also improve the ventilation and air quality of buildings leading to a reduction in respiratory issues. (66) Refurbishment schemes also mean reduced relocation time for residents, making them less susceptible to the mental stress of settling in a new location.

Regardless of refurbishment or demolition/rebuild a key tool to mitigate stress place on residents is community engagement, with up to date knowledge of the works reducing the mental impacts of renewal. (67) Due to long and often shifting time frames residents can often feel their lives have been ''put on hold'' (68) This feeling can lead to a pause in household maintenance, engaging with community activities and uncertainty in planning for the future, this behavioral change is particularly seen in more vulnerable tenants. (69)

The demographics of an estate is a large factor in the level of mental and physical health impacts from both refurbishment and demolition/rebuild. Residents who are elderly, disabled and already in poor health have less

resilience to cope with disruption in their housing situation. These factors also limit people's mobility, meaning they are more reliant on local health and social services. (70) Older tenants are more likely to experience stress during the relocation period, where as younger residents see it as a new opportunity. (71) There has been a proven link in the level of mental and physical health risks associated with housing renewal and the level of control felt by elderly residents. The involuntary movement of older residents away from their homes had a larger impact on their health than if the move was voluntary. (72) Feelings of control are tied in with the level of community engagement from the municipality. There have been multiple case studies carried out which suggest the relocation of elderly tenants can lead to stress and anxiety due to the move. (73) (74) In some cases, this decline in mental health can have impact on physical wellbeing. In the review of multiple case study in Sweden a link between a higher than average morality rate and the movement of elderly people into new housing was found. (75)

While the main intention of both renewal schemes is to improve the housing standard for residents it is equally important for tenant's health to maintain social ties with the community. The loss of these ties can lead to lack of support and feelings of isolation, which can have physical and mental health impacts, particularly amongst elderly and vulnerable tenants. (76) One study, Go Well Glasgow in 2011, found that despite the poor condition of the housing, residents saw the social relationships and support structures within and beyond their neighborhood as having larger impact on their health than their built environment. This was the case despite the study finding the quality of the housing being connected to many of the health issues face by the tenants, including mental wellbeing, childhood asthma and related illnesses. (77)

Heritage Value:

Heritage value of modernist housing within a Western context is not often featured as a prominent argument for the refurbishment of social housing. With such a large amount of housing built in a short period, examples of modernist government housing are often generic and unremarkable. This is due to the schemes regularly employing similar design and build methodologies. However, examples of valuable heritage modernist social housing exist, and are key representations of the urbanism of the 1950, 60s and 70s. The modernist legacy and its planning applications have shaped large portions of cities around the world. Housing estates built during this period are a monument of a previous ideological period within architecture. By refurbishing modernist social housing blocks and towers with respect to the original design, the architectural heritage of a movement can be preserved.
Specifically looking about social housing the modernist movement's role in the creation of mass government housing scheme cannot be understated. The movement provided an ideological base on which to provide public urban infrastructure. The preservation of modernist estate buildings is a protection of the influence modernism had on social housing.

In countries such as the UK the scale of post war development and the ties between planning and the social engineering of a welfare state have spurred pointed critics of Modernist urbanism. (78) This has a large impact on the perceived value of a post war housing, and by the 1980s the planning methodologies of modernism were not being implemented in large scale housing within the UK. One fault of defining the preservation value of a building that is unfashionable or unpopular, is the justification of its significance on esoteric architectural or historical grounds. (79) This is often the case when considering modernist structures which have been labelled as unsightly.

Social housing modernist architecture may presently prove unpopular with the wider public, however the legacy of modernism and its contribution to state owned housing is important to protect. Modernism spans many sub-genres of building design and core examples of movements within modernism often function as social housing. When considering the validity of a claim of heritage preservation it must be assessed at an individual level and heritage value is specific to the context in which the building exists. The option of refurbishment allows for the preservation of an integral part of post-war history and respectful design can elevate buildings to their former glory with a continuation of the vision that modernism set out to achieve.

3

Examples of Social Housing Refurbishment in Europe

In recent years there has been a push for the refurbishment of modernist social housing. Modernism has had a large influence in the urban fabric of many European cities with mass housing providing a solution to the destruction of large portions of housing stock in World War II. The debate around the value of social housing building retention is mostly focused within a European context. The following examples of social housing retention have been selected on strict criteria.

There are multiple examples of social housing refurbishment in Europe however many are simply aesthetic exercises and do not benefit the existing community. Poor renovation practices can lead to tragedy as seen with the Grenfell Tower fire in London in 2017, where 72 people lost their lives. The renovation at Grenfell has been criticised as visual gentrification of the area to appease to newly built luxury apartments. (80) The facade cladding used in the renovation of Grenfell has been blamed for exasperating the extent of the fire.

This report aims to avoid learning from poor renovation practices by applying the following criteria when selecting examples:

Architectural Excellence:

Each case study is an example of exemplary architecture that improves the living standards for the community. The architectural interventions in the buildings aim to correct the design follies and strengthen the positive attributes of the form. The case studies range from heavy surgical renovation and retrofit, to lighter construction depending on the context of the building.

Unique response to context: .

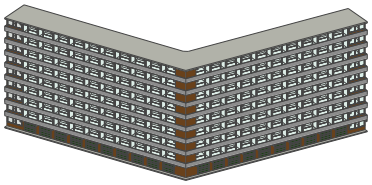
The case studies each provide a unique example of a specific context and result. No two case studies have the same architectural outcomes, and each respond to the issues associated with modernist design with different applications.

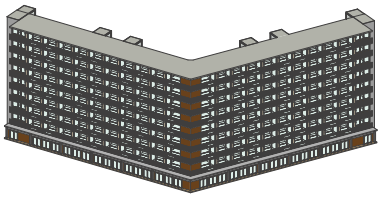
Community Retention and Benefit:

Each of the chosen case studies has resulted in the benefit to the existing community. All of the case studies retained the original community, with many allowing residents to stay in their homes during the construction works.

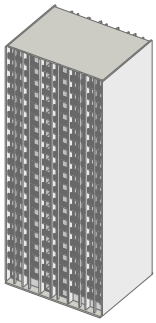
Note: The interviews conducted for each case study have been edited for brevity and syntax. Due to this the words used cannot be directly attributed to the interviewee.

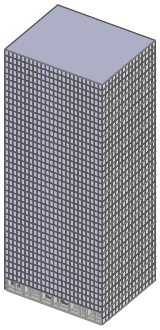
Case Study 1: Omoort, Roterdam Netherlands



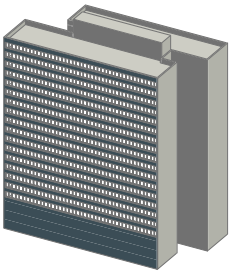


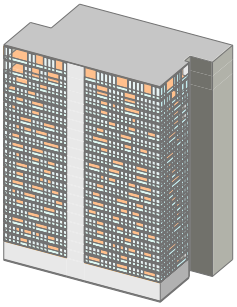
Case Study 2: Lormont, Bordeaux, France



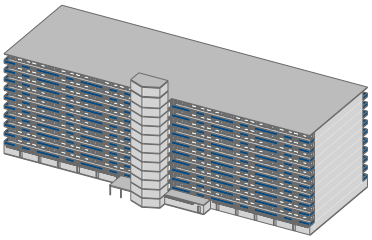


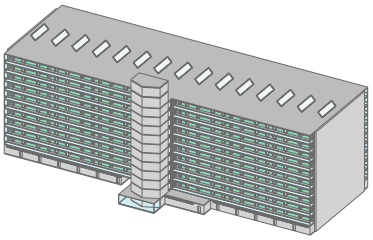
Case Study 3: Camden, London, UK



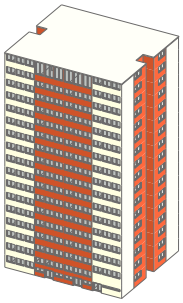


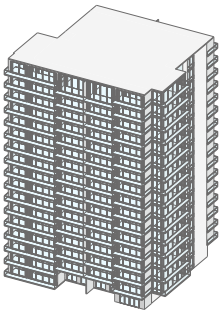
Case Study 4: Uithoorn, Amsterdam, Netherlands





Case Study 5: Multiple locations, France





Case Study 1: Splayed Apartment Blocks

Location: Omoort, Rotterdam, the Netherlands

Architect: Hans van der Architects

Year built: 1968

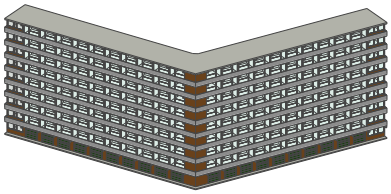
Year refurbished: 2009

Stories: 9

Splayed apartment blocks is an excellent example of tailoring built form to the needs of the residents. The dual design methodology deals with the specific desires of each demographic. The four, previously mixed tenancy, blocks were separated into exclusively elderly tenancy and general market tenancy. This led to design outcomes which ensure the improved function and accessibility for the residents based on need.

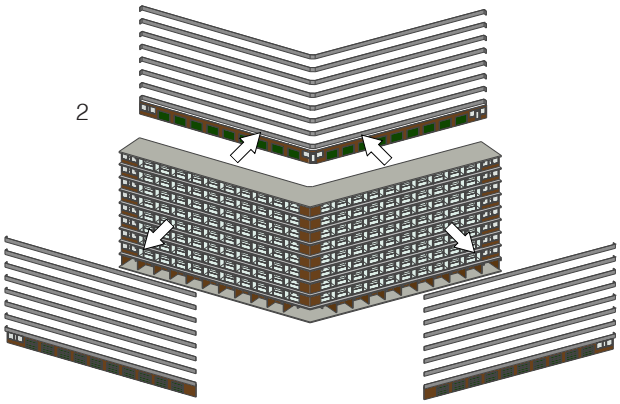
Elderly Refurbishment:

1



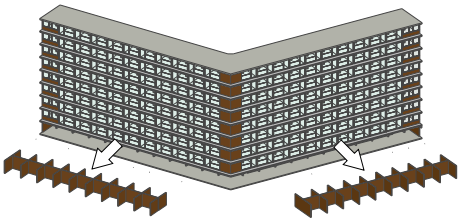
Original

2



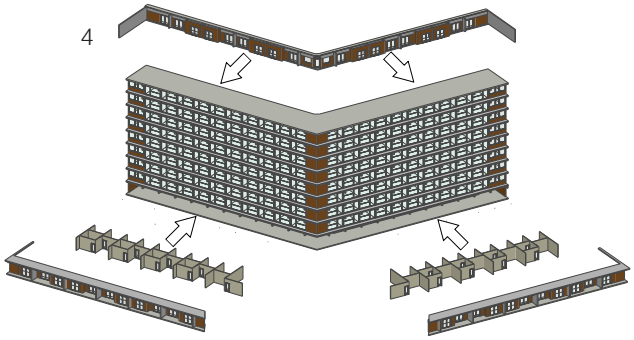
Remove garage doors and balustrades

3



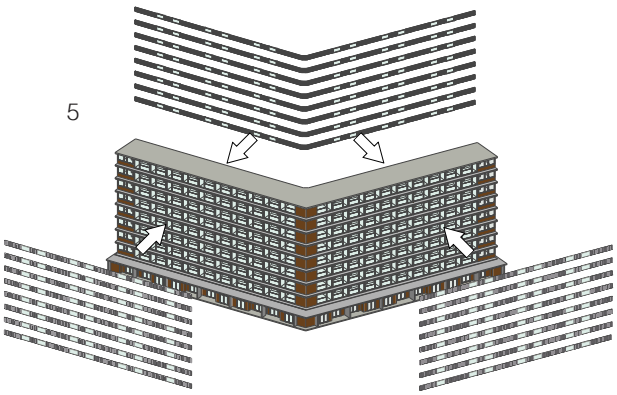
Remove garage walls

4



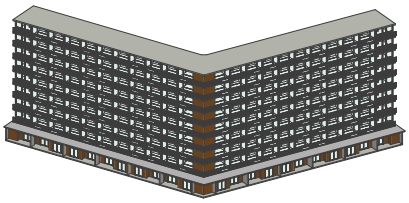
Add new plinth with community spaces and apartments

5



Add new balustrades

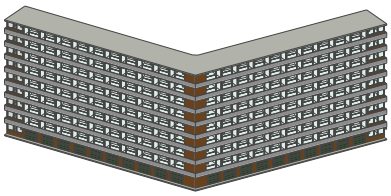
6



Refurbished!

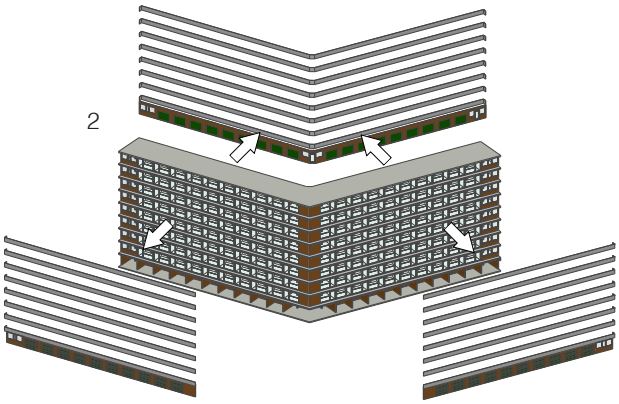
General Market Refurbishment:

1



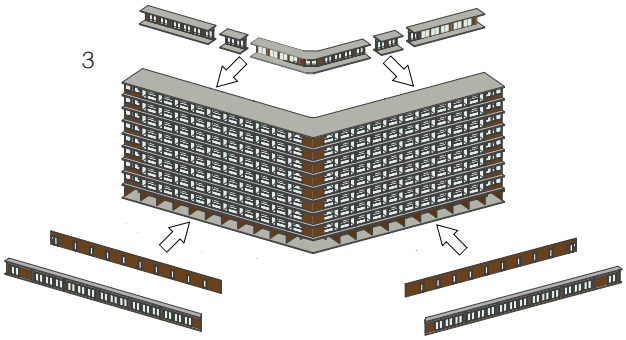
Original building

2



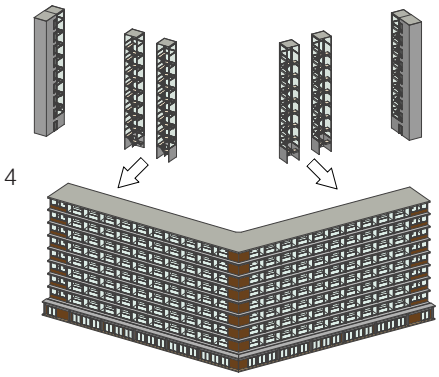
Remove garage doors and balustrades

3



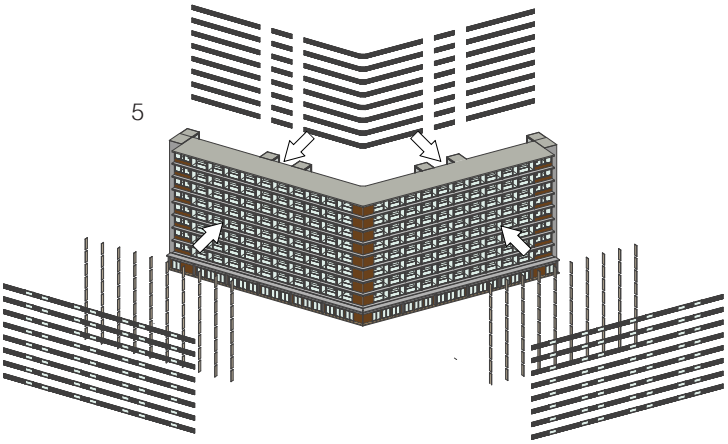
Add new plinth with circulation and re-purpose garages into storage and community spaces

4



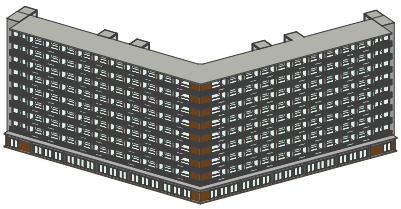
Additional vertical circulation through new stairs and lift shafts

5



Add new balustrades and partitions to break up long access deck

6



Refurbished!

View of Refurbished Elderly Building from Surrounding

Analysis:

Omoorot is located on the outskirts of Rotterdam in the Netherlands. With main construction being completed in 1968 the majority of the residential district consist of multi-story blocks connected by large open green spaces.

Accessibility framed a large portion of the design solutions for both tenancy refurbishments with tenants previously sharing one entrance and two lifts. The need for dedicated elderly housing came as newer tenants with varied economic and ethnic backgrounds were unfamiliar with the delicate codes of the older occupants, many of whom had been in the blocks since they were built. The refurbishment did not deal with the interior layout of the apartments as they were deemed to be well designed and an asset to the form. The majority of the works addressed vertical accessibility and connection to the ground plane.

The original buildings included garages on the ground floor, the removal of the garages from both sets of blocks had a remarkable effect on the accessibility and walkability of the ground plane. Previously with parking garages there would be a required 7m curb and 7m road way which the building would connect to. While traversable, the 14 metres directly adjoined to the building belonged exclusively to the car. The removal of the garages saw the re-activation of the space with the building's connection to the ground plane significantly improved.

This connection to the ground plane was strengthened by the addition of a deeper, more well defined plinth in both refurbishment strategies. The plinth addresses the issue of scale often impacting the legibility of space within modernist housing blocks.
The protrusion from the base of building allows a user to gain an understanding of space and frames the entry to the building. Different programmatic application were given to the plinth based on tenancy need. The design and application of the plinth was based on the rigid gridded pattern of the original form. The large pre-cast columns of the plinth run parallel to the protruding beams that mark structural grid.

The materiality of the new extension marries the previous structure with the new additions. The texture and palette of materials compliments the original design while remaining individual and definable. The new bricks and concrete differ in texture and colour from the original, with the new pre-cast concrete dominating the material understanding of the ground plane. Minor detail including bronze framing for the new windows also lends to a conversation between old and new. The aesthetic application of the design compliments and challenges the modernist design breathing new life into a dated structure.

The different tenancies required varied design methodologies and understandings of space. The main differences within the design applications came within the ground floor and apartment access. The apartment blocks for the elderly included the addition of new apartments while the general market design included storage and new circulation path. The elderly apartments reduced bike storage while mixed tenancy increased the bike storage capabilities. The addition of a gardens at the front and rear of the elderly tenancy created a threshold between public and private.

The length of the access decks was also dealt with differently being broken up in the mixed tenancy and retained as a single access path for elderly residents. Four additional fire stairs were added to the general market tenancy with both structures also inducing new lift cores.

View of Refurbished Elderly Building from Surrounding Park

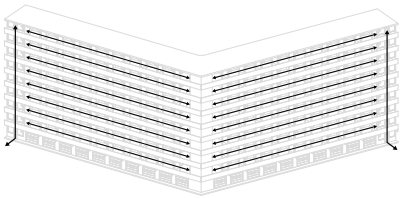
"These buildings have developed a habitat. They are full of people, full of emotions, full of memories and we can't neglect that."

Original Buidlings (Photo Courtesy of Hans van der Heijden Architects)

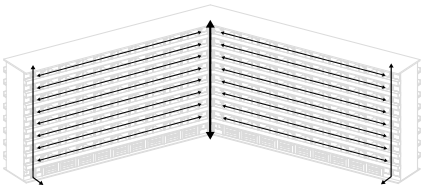
Refurbished Mixed Tenancy Building

Original Buildings

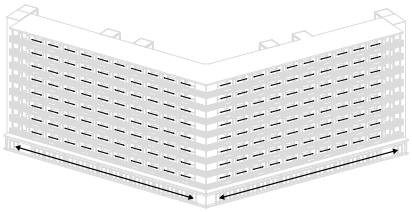
Refurbished Building



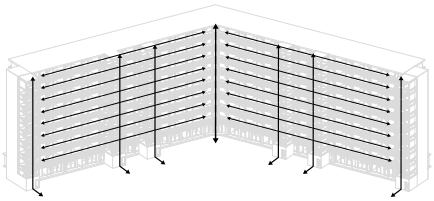
Existing Circulation Front



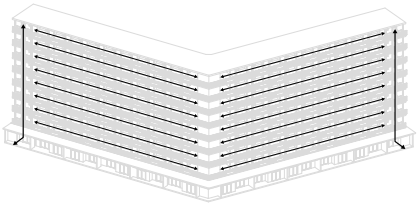
Existing Circulation Back



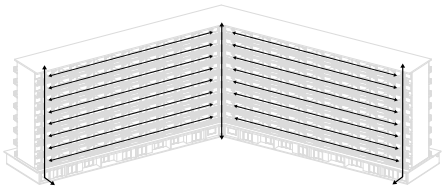
Mixed Circulation Front



Mixed Circulation Back



Elderly Circulation Front



Elderly Circulation Back

Interview:

Interview with Hans van der Heijden of Hans van der Heijden Architects at their office in Amsterdam.

Why is a refurbishment of the social housing important over the demolition and rebuilding of the estates?

In almost any western society, more than half of our buildings are post-war. It is not feasible to knock them all down, and I believe not desirable to think that the complete housing stock should be replaced. These buildings have developed a habitat. They are full of people, full of emotions, full of memories and we can't neglect that. A considerable amount of effort is needed to evaluate what are the strongest parts of both cities and buildings, and to then develop an improvised architecture to deal with the weaknesses.

I remember asking some of the residents what is keeping you busy? And they said, "Well, it's those new people that are moving in. They parked their bikes on the access decks." So it made me aware that these blocks were full of secret codes. You park your bike obviously downstairs in the bike storage and not on the decks. So effectively, most of those problems where not architectural, they had to do with architecture, but were written in the code of a place. So that's where the conversation started. Our approach to designing a refurbishment is the combination of reading the habitat, while also the reading the urbanism of an area.

A reality of refurbishment is that you never fully convert a building from its original form, something must be retained. That requires talking to people, it requires a knowledge of the architecture and the systems that have been used to build them. There is cultural component and to me, the reading of such situations is what's keeping me busy, that element of reading has become a more important of the process rather than to design by sweating.

Ground Floor Elderly Apartments with Gardens

Could you point main differences you saw between the buildings, and differing needs between elderly and mixed residential apartment?

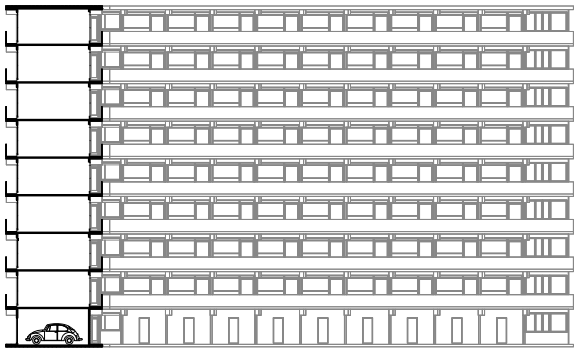
Outside of the ground plane, the debate very much was the length of the gallery. The length of the gallery for elderly shouldn't be a problem. If they want to live in something that has communal features, it's only logical to develop an understanding with your neighbours. That was something completely different for housing that was sold on the general market due to the aspect of anonymity, there the galleries much shorter. The developer kept asking us, well what is the best length? We are architects and while we take part in socially driven discussions, we don't have that knowledge. I think that it is not on us to predict what will happen socially.

When looking at modernist estates what do you think the largest folly was?'

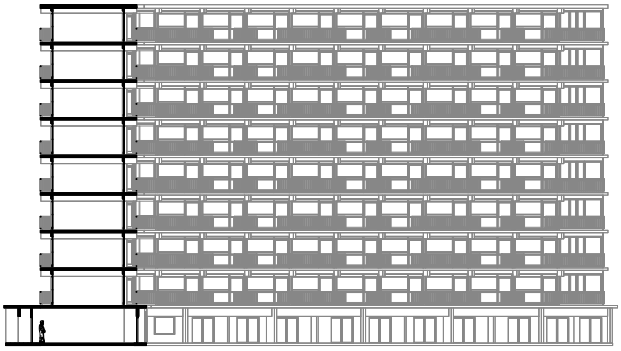
It is very boring, but these structures are quite poor. The thickness of walls are minimal, the thickness of floors is minimal. Everything is minimal. Generally speaking they are lousy structures, which you will always find in the redesign of it. The sound proofing, energy consumption, all these things are generally at a poor level.

Do you believe the profession of architecture is responsible to redirect its own design follies of the past?

That's a moral question, I'd much rather say that it's a reality we are in. I am not responsible for the mistakes of my grandfather, but I am responsible for the world he left behind.



Original



Elderly Section

Mixed Section

View of Elderly from Adjacent Walking

Rear of the Elderly Block

Case Study 2: Urban Renovation Lormont

Location: Lormont, Bordeaux, France

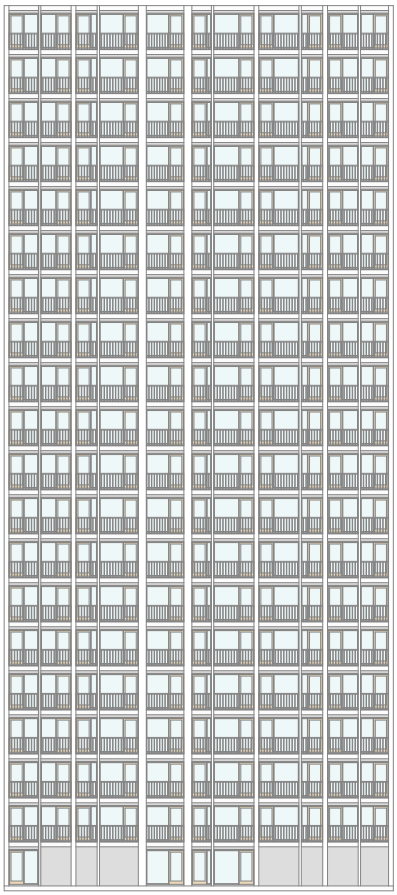
Architect: LAN Architects

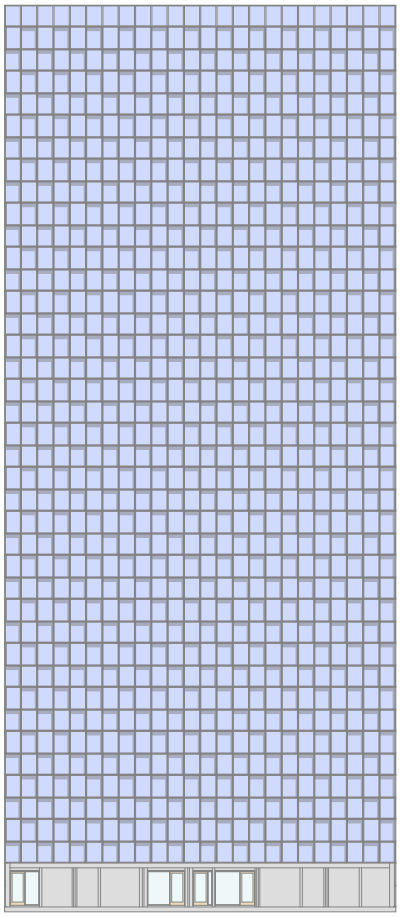
Year built: 1960 - 1975

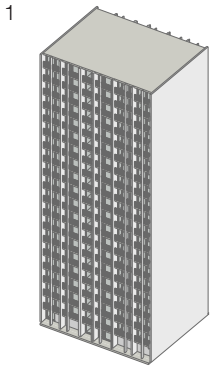
Year refurbished: 2014

Stories: 20

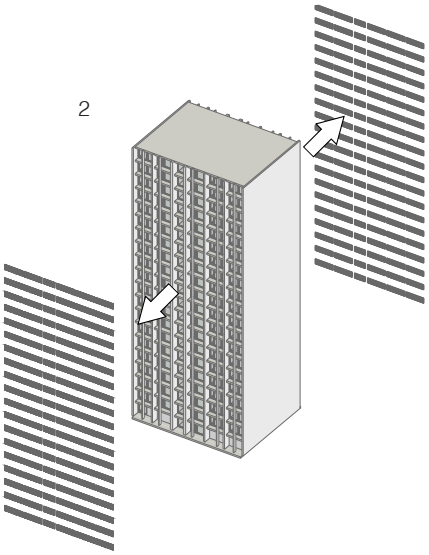
Urban Renovation Lormont by LAN architects provides an example of rejuvenation of the public urban realm as well as the built form. The refurbishment of the buildings in conjunction with the revitalisation of the ground plane has lead to a highly successful renewal project that is creates an open and inviting space for residents and public to enjoy.



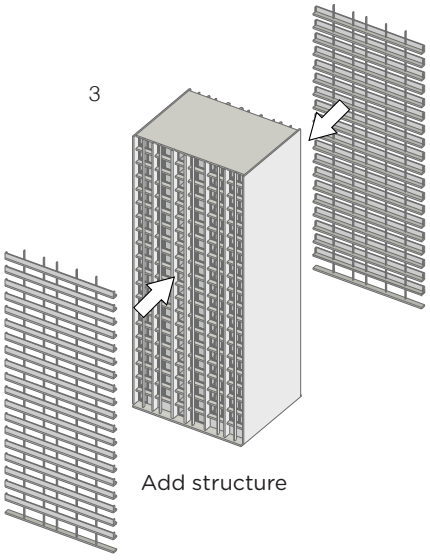




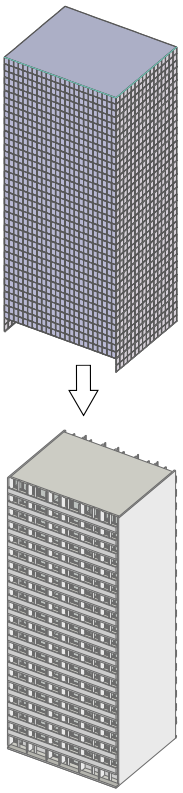
Original building



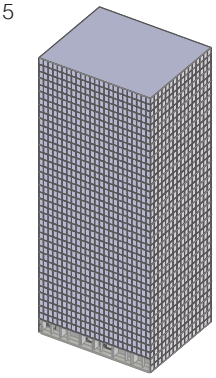
Remove Balustrade



Add structure



Add facade



Refurbished!

Analysis:

Lormont is located within the suburbs of Bordeaux France. The Genicart district is composed mostly of social and community housing. The area comprises 10% of Lormont's city territory and is home to 10,500 people, roughly 50% of the population. The regeneration project consisted of the renovation of 710 apartment blocks, 387 being in high rise towers.

Saint Hilair Towers are three 19 story towers located within the centre of the estate grounds and provide a landmark for the area. The brutalist buildings built between 1960 and 1975 have been re-clad with a skin which improves the aesthetic value of the buildings, extends the space within the apartments as well as provide increased thermal performance.

The materiality of the skin is in direct contrast to the previous heavy concrete facades. The polycarbonate structure providing a playful and light solution to structures which dominated the visual field of the ground plane. The individual modular design of each window provides tangible scale from the ground plane, this is strengthened through the facade treatment providing a boundary for the building as well as engaging with the ground.

Previous balconies of the apartments have been extended and enclosed with operable windows to create open-air living spaces, known as loggias. The new facade consists of polycarbonate shutters which sit within an aluminium frame, these are attached to a precast concrete slabs which extends from the existing slabs. The previous balcony depths of 93cm were extended to 160 centimetres, maximising airflow and increasing the thermal exposure of the buildings envelopes.

These operable windows create a constantly varied facade patterning, visually distinguishing each block. The facade also acts as a privacy screen for private exterior space which is now read as interior. The exterior space is accessed from the living room of each apartment with the slideable windows being attached to a glass balustrade, creating an animated facade.

The architectural refurbishment works on multiple levels, initially designed to increase the thermal performance of the buildings, it creates new spaces within the buildings as well as allowing for comprehension and differentiation of forms. The effect is multiple collective visual patterns within an area, distinguishing boundaries within space. This works in conjunction with the reconfiguration of the public realm to create visual and spatial hierarchies.

The revitalisation of the area was split into two categories, dealing with the current built architecture and the ground plane. The large open planned estate is indicative of many modernist social housing areas within Europe. The connection to the ground plane has been a criticism modernist estate housing, with buildings often lacking a relationship with the scale of the human. The project addresses the constraints of large collective housing estates while maintaining much of the built fabric.

The reconfiguration of the public path ways establishes public and private hierarchies to increase the use of collective space. The unclaimed public realm is redefined as communal circulation while paying attention to the small break out public spaces that adjoined the path ways. The inclusion of green areas, sports facilities, play

Original Buildings (Photos Courtesy of LAN)

Refurbished Buildings

grounds and new pathways establish a relationship with the architecture and claimable public space. The previous labyrinth of convulsed circulation paths have been removed for more wide open traversable space with clear sight lines and paths of travel.

The visual cues have been added to dictate the urban condition including hard and soft materiality, creation of transit spaces, terraces, retaining walls and abrupt changes in levels. The combination of these urban methods creates clear, accessible and understandable spatial conditions. The disconnected public realm in the courtyard of the three tower blocks has been regenerated as a large concrete square with a playground to promote the area as a destination within the estate.

The hard concrete texture of the open public realm between the towers is a contrast to the structured landmarks and lush greenery. The threshold of the estate is easily understood and defined through a natural barrier of greenery, with all fencing on the site being removed.

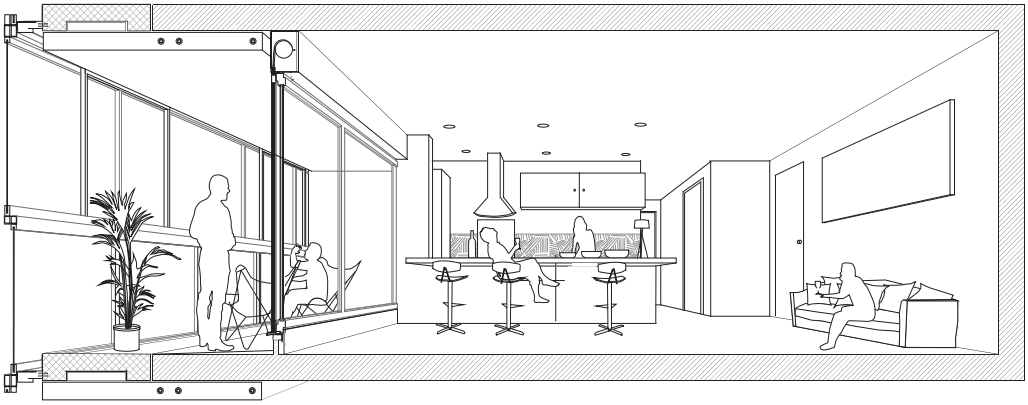
Vehicle access was also a large issue facing the estate, with new parking situated on the periphery of the estate to encourage a pedestrian friendly environment. This includes restricting vehicle access totally from the south side of the estate. The absence of vehicles and meticulous design planning has resulted in all open areas around the feet of buildings becoming “urban parks”.

Original Building (Photo courtesy of LAN Architects)

Refurbished Building (Photo courtesy of LAN)

View of estate from surrounding area

Original Section (Courtesy of LAN Architects)



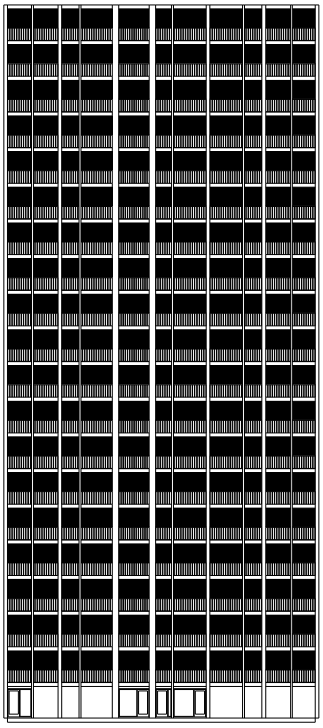
Refurbished Section (Courtesy of LAN Architects)

Closed Facade

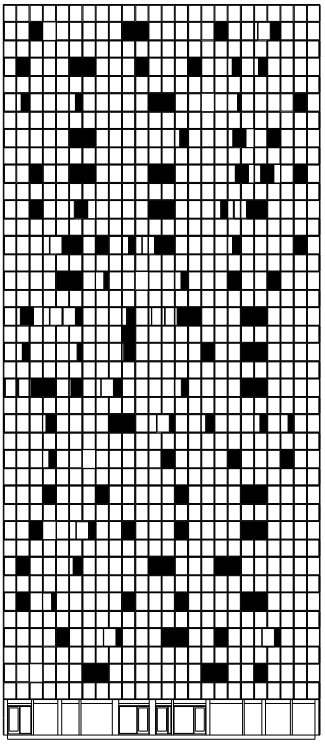
Varied Opened Facade

Public Playground on Estate Grounds

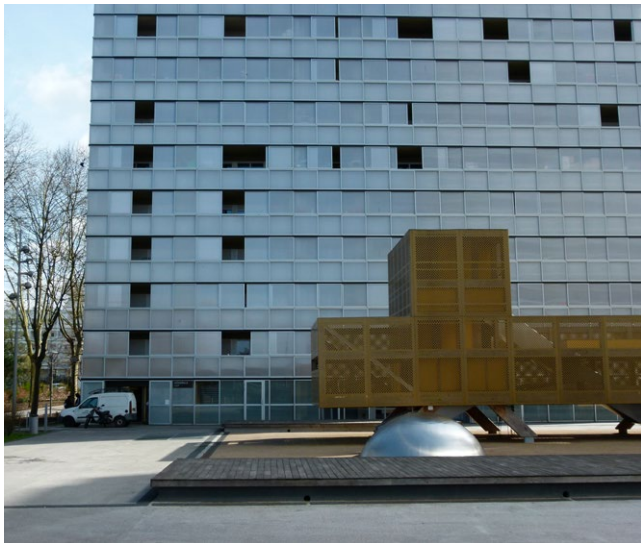
View from public space on estate grounds



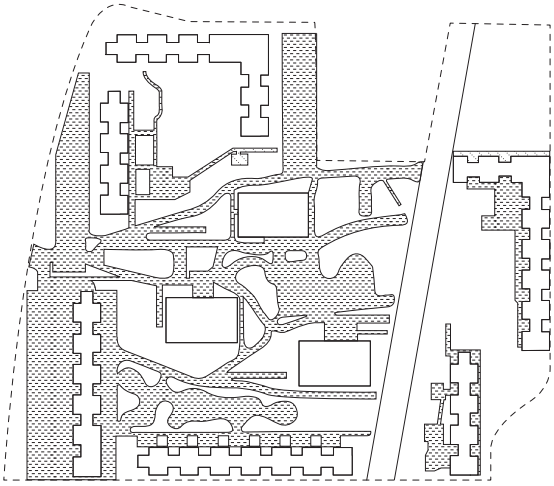
Original Openings Study



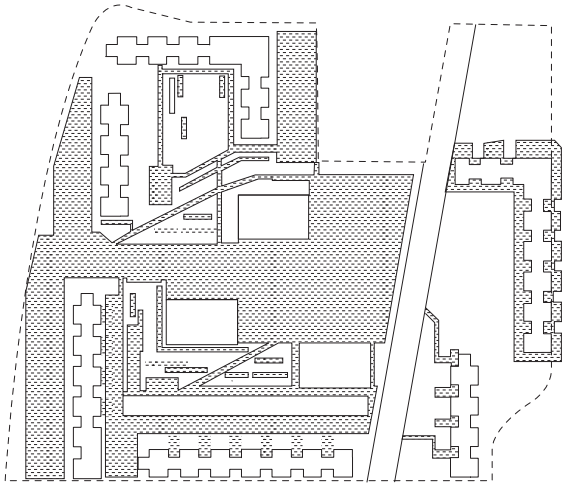
Refurbished Openings Study



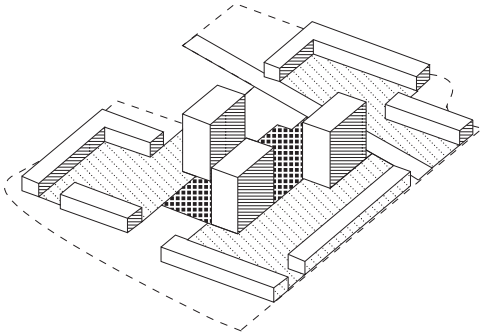
Circulation and public realm

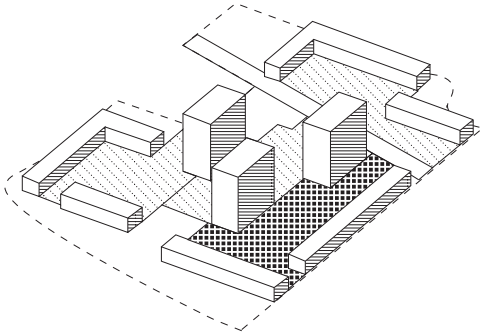


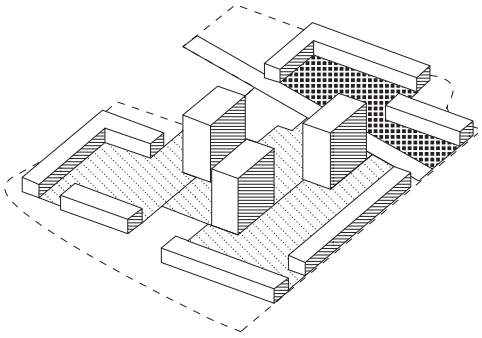
Old Ground Plane Circulation

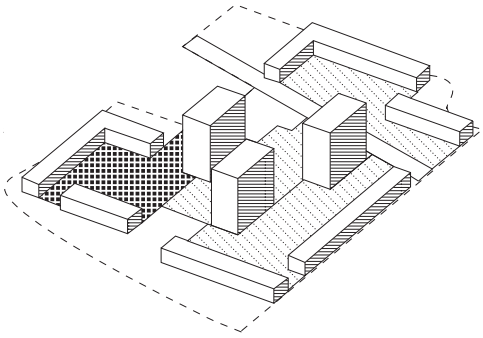


New Ground Plane Circulation

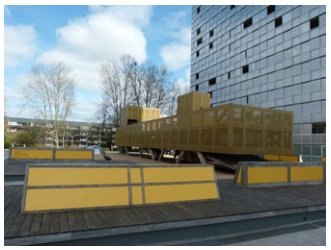








Four different areas of programmed Urban Parks



Case Study 3: Lulworth Tower and Agar Grove Estate

Location: Camden, London, UK

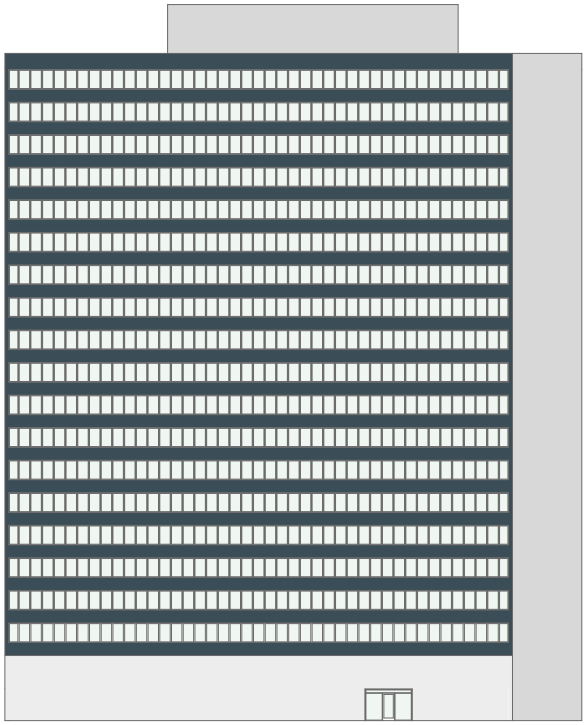
Architect: Hawkins Brown

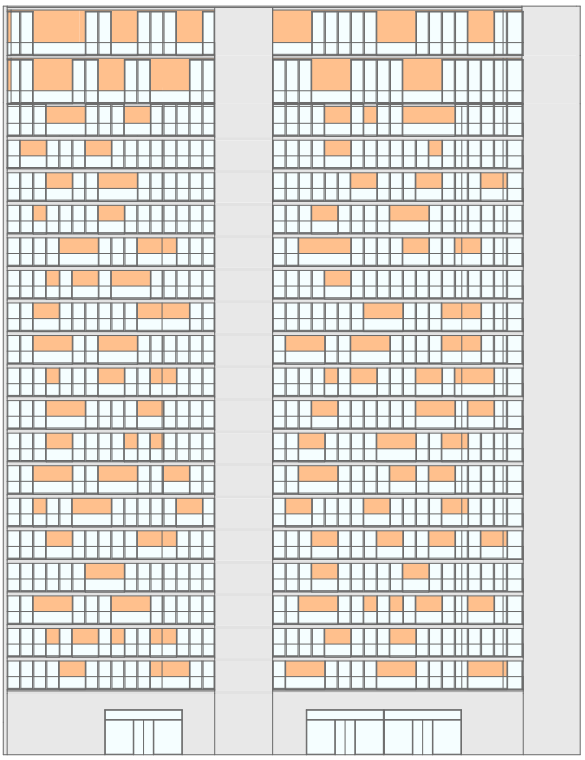
Year built: Circa 1964

Year refurbished: Planned for 2020

Stories: 19 + 2

The Agar Grove Estate renewal, which includes the renovation of Lulworth Tower is an example of re-use and re-adaptation of modernist tower blocks. The reduction of the building to its structural skeleton opens the opportunity for a completely new understanding of form while reducing carbon emissions.





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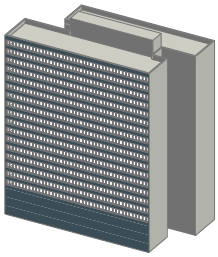
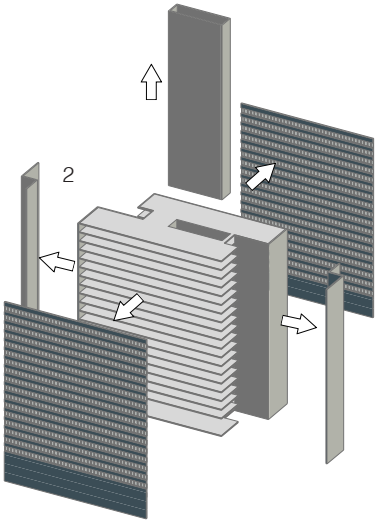


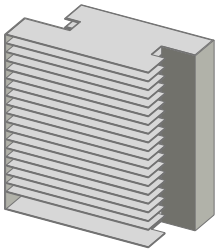
Original Building

2



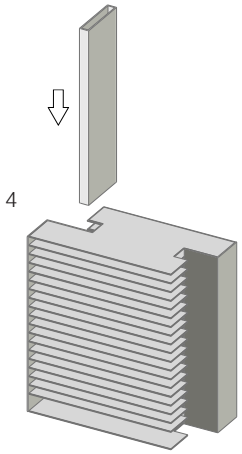
Remove facade, circulation core and service rooms

3



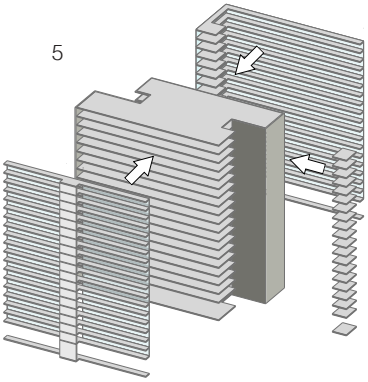
Stripped structure

4



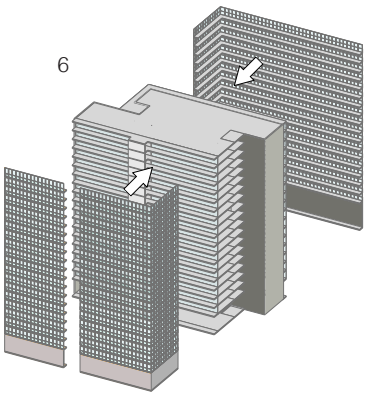
New circulation core

5



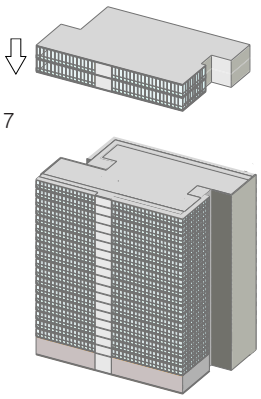
New extended interior space

6



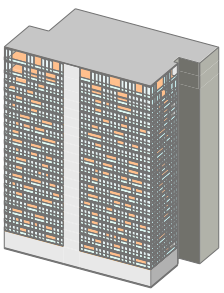
New extended exterior space

7



Add new floors with

8



Refurbished!

Current Estate (Photo Courtesy of James Woodward Architects)

Planned Estate (Photo Courtesy of Hawkins Brown Architects)

"I have lived here for more than two decades and we have a very strong sense of community. I know my neighbours – we are a multiracial, multi-class, multi-age group and everybody supports each other."
- Lulworth Resident

Analysis:

Agar Grove Estate is located within Camden, London. Prior to the redevelopment scheme the estate housed 210 social housing tenants and 39 leaseholders. The redevelopment scheme is a combination of refurbishment and demolition/rebuild. The aim of the redevelopment was to re-house the current community prior to their homes being demolished. A single decant mitigates the social issues surrounding demolition/rebuild schemes.

Post construction the renewed estate is to hold 493 homes, 216 for social rent, 37 for shared ownership and 240 for private sale. The funding model for the redevelopment was the sale of private housing to subside construction costs for the refurbishment and new buildings. Building is expected to be finished in 2020

The renewal scheme uses a mixed typology to supply the various need of residents on the estate and to create a visual hierarchy and sense of place.

The current form's facade is punctuated repetitive horizontal slabs with narrow strip windows in between. The light weight extensions will contrast the previously heavy construction. The addition of coloured window panes in the façade break the monotony of the tower and provide a distinct character to the development.

A central concierge will occupy part of the ground floor, with a view directly onto the street. Entrances on the east and west side will connect through the building so that the public space and beyond can be clearly seen. The current entry way of Lulworth tower is limited to two small door-ways on the East and West facing facades of the building. There is a little reference or connection to the public realm or adjoining path ways. The new entrance way will reconnect the building to the public realm and reclaim previous parking allocations.

The refurbishment relies heavily on the use of transparency in order to facilitate an open and light material understanding. The material also provides over view of the estate grounds increasing passive surveillance.

The main refurbishment within the estate grounds is Lulworth tower. The tower, built circa 1964, houses 137 dwellings. Tenants opposed the demolition of the tower citing the strong bonds of community and sense of place as a reason for its retention.

Lulworth Tower is a 19-story building and a landmark in the middle of the estate. The refurbishment intent of the design was to improve the sustainability of the building while giving it a distinct identity. The refurbished tower will not house original tenants, the tenants will be moved to a new tower on the estate grounds, meaning a single decant is required. The refurbished apartments will be sold on the private market to subsidize the works.

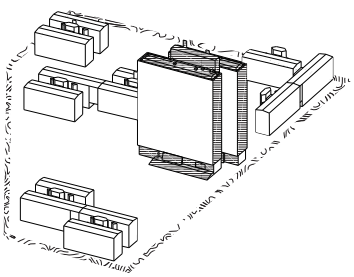
The decision to refurbish the tower was due to the significant amount of embodied carbon from the towers construction. The refurbishment is a large part of the sustainability strategy for Agar Grove. The works remove the existing dwellings and external cladding reducing it to a concrete skeleton. The central stair and

Planned Estate (Photo Courtesy of Hawkins Brown Architects)

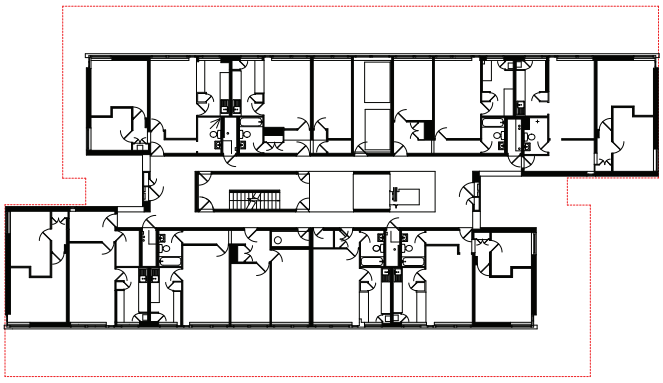
"If Lulworth is knocked down, this community will be completely destroyed. There is now a sense of fear as to what the future holds. We feel they are coming for us regardless of what people think needs to be done."
- Lulworth Resident

lift core will be removed to open up a full-length corridor with windows at each end, with views over the common space and parks below. The refurbishments use little of the current design outcomes rather implement a strategy based on reduction of energy costs through the re-use of structure. The current apartment layouts will be re-devised prioritising the access to the winter gardens.

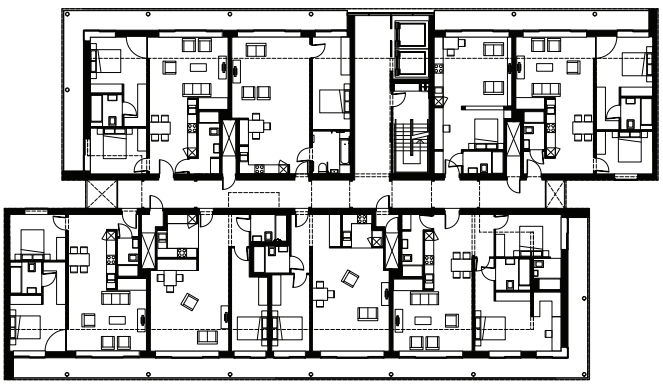
The building will be extended outwards and upwards to add value and improve the quality of space within. The addition of floors on top of a construction, called top hatting, can dramatically increase the financial viability of a scheme due to the sale of luxury penthouse apartments. Outwards extensions will be fitted, creating balcony areas that allow for adjustment to winter gardens in the cooler months. The addition of winter gardens will not only amplify the amount of light within the new apartments however also provide private outside amenity space which is currently unavailable.



Original Estate Layout



Lulworth Tower Original Plan



Lulworth Tower Refurbished Plan

Planned Connection to Ground
(Photo Courtesy of Hawkins Brown Architects)

Master Plan of Estate (Photo Courtesy of Mae Architects)

Planned Lulworth Tower Facade
(Photo Courtesy of Hawkins Brown Architects)

Interview:

The following interview is with Seth Rutt and James Woodward of Hawkins Brown Architects, one of the two principal architecture companies responsible for the works at Agar Grove.

When devising possible outcomes, what was the initial design intent for the renewal of Agar Grove?

Seth-

If you look at the site plan of the existing estate, you can see how the blocks are designed on east west aspect and they completely ignore the lining of the streets. What they do is to create triangular pockets of space and the streets are completely ignored. The landscape in the space between the buildings was something we wanted to address. We wanted to make it a usable space, not just a buffer to the streets.

The first move that we took was to re-frame the streets with Alex from Mae Architects, and the very first principles that he talks about is stitching in continuity with the townscape. We haven't slavishly copied Victorian villas, but when you look at Alex's buildings onto Agar Grove, they are very much determined by the Victorian villas on the opposite side of the road. When you look at our buildings they're somewhat bigger than the Victorian terraces, this means the streetscape there is very eclectic.

Another defining parameter for this master plan was a single decant. Every resident on the estate can watch their new home being built and then move in. That has defined the master plan because if we had just completely wiped everything away and started again, this would be a very different master plan. We'd be unlikely we think to achieve the height of the estate without keeping the existing tower. An interesting aspect of the project was the residency of the tower wanted to stay together. The retention of the tower was outside of the master plan scope at the start, but when we showed the tower residents, they wanted to be part of the story and wanted to stay together in a tower. This new tower on the corner is for the social housing residence within the existing tower.

That was unexpected for us, so retaining the existing tower established precedent for height. The new tower went into the least sensitive part of the site for height, which released the existing tower for retrofit. The master plan diagram is all about creating a network of streets and squares and stitch in with the surrounding context.

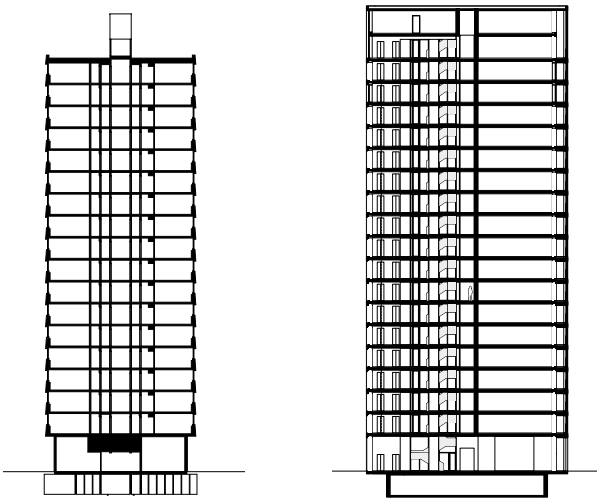
You've already spoken a little bit about the community. What did you do to ensure that the community's interests are taken into account?

Seth-

The important point is that when you have an estate with 250 families, they might not get along, but people do get to know each other. It's probably a bit of a myth to pretend that they are all one big happy community, but what you have is clusters of friendship, social and family groups within that community. The minute you move someone off site, they're probably not going to come back because they will resettle. That's how you break apart friendships.

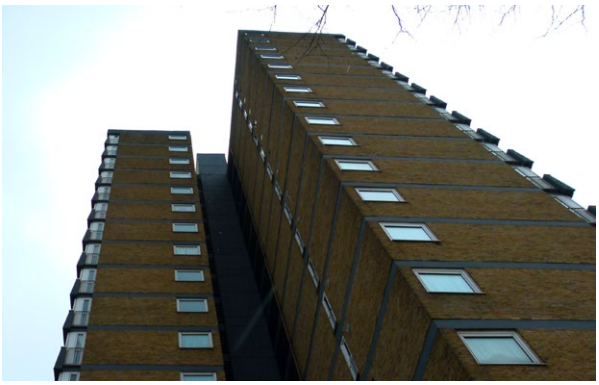
A primary defining feature is to have a single phase decant. We can't take credit for ensuring the community's interests were taken into account at an early stage because that was all done by the client, Camden Council. Camden were responsible for community engagement before we were brought on the project.

Our role was to conduct regular sessions every six to eight weeks. So the process was open at every stage, even when the master plan was crude, we broke cover and showed the residence. We didn't just work for six months and then present something complete. The best thing you can do is be open with consultations. When we would conduct meetings with various stakeholders and clients we would go back to the local residents and discuss with them what was going on and get their opinions as well. It's not just about showing them the finished design scheme, it's taking the resident's positive and negative comments on board.



Original Section Refurbished Section

Current Entrance to Lulworth Tower



Short Facade Materiality

Current Facade

Current Lulworth Tower Facade

How do you approach materiality in the design of the estate and refurbishment?

Seth-

I think it's a fairly straight forward question in that London is a city built in brick. For us it was almost an instinctive first step that this would be a brick-based master plan. However, what was interesting was the tower, it is a sixties block and had a very interesting slipped plan, we designed a brick finish to the solid ends with a very simple diagram with two interlocking L shapes. This respected and reinforce the existing floor plate of the building. The building opens out on the other side with exposed slab edges and floor to ceiling glass screens. The original tower was not primarily expressed in brick, so refurbishing with brick felt like a wrong step. The new tower however, we were more comfortable using brick.

With the prevailing consensus that the modernism Utopic vision has failed, do you believe the profession of architecture is responsible to redirect its own mistakes of the past?

James-

Architects are not necessarily responsible for the mistakes of the past, but I think we'd be stupid to not learn the lessons and not be naive in some respects. Postwar housing had confidence and optimism, which generated the architecture of the 50s, 60s and 70s. There is a naivety about it and I think we'd be foolish not to learn those lessons. I don't think that the utopic vision has failed. I think there's certain failures of modernism and a stigma attached to council estates and to social housing, There are all sorts of other societal factors that have influenced the current state of these buildings, the ''failures'' are not purely because of the architecture.

View from refurbished tower
(Photo courtesy of Hawkins Brown Architects)

''When we showed the tower residents, they wanted to be part of the story and wanted to stay together in a tower.''

Lulworth Tower Currently (Photo Courtesy of Mae

Case Study 4: Urban Renewal Europarei

Location: Uithoorn, Amsterdam, the Netherlands

Architect: Atelier Kempe Thill

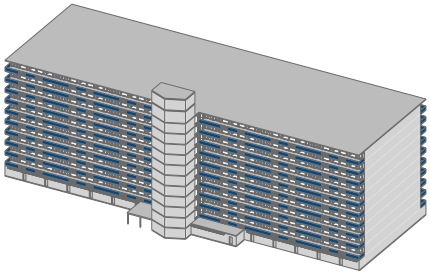
Year built: Circa 1969

Year refurbished: 2004 - 2012

Stories: 11

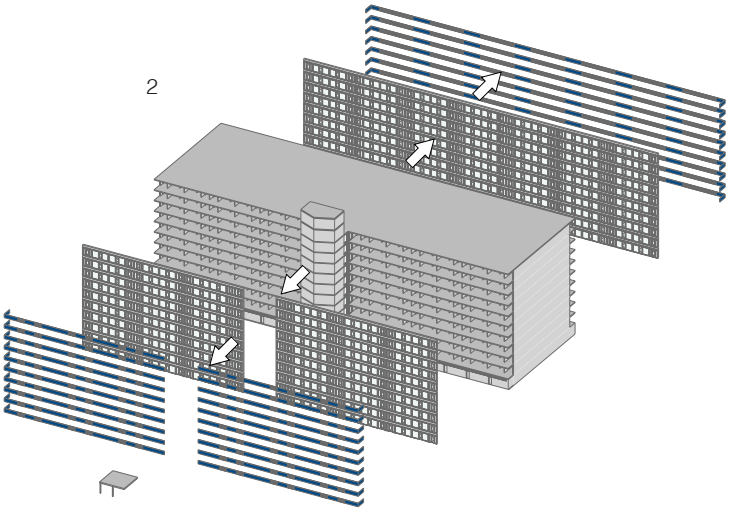
The refurbishment of nine separate modernist housing blocks provides an example of the impact aesthetics have on the perception of an area. The light architectural intervention achieves improved ecological sustainability and a redefinition of previously imposing structures with only minimal disruption to the residents.

1



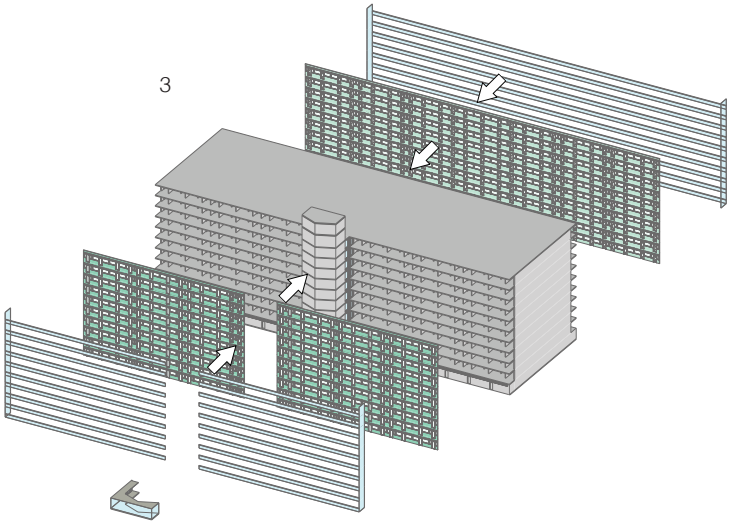
Original building

2



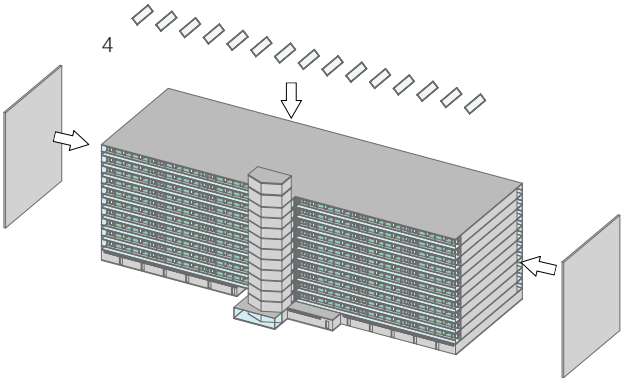
Remove balustrades, entrance way and external walls

3



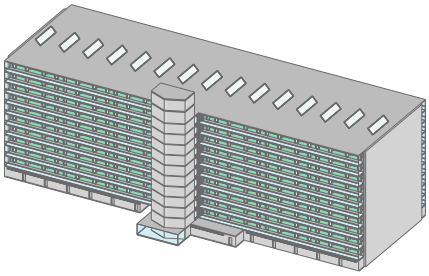
Add new glass balustrades, entrance way and external walls

4



Add insulation and solar panels

5



Refurbished!

Analysis:

Located on the outskirts of Amsterdam, the Europarei estate has seen the refurbishment of 1100 apartments in nine separate modernist slab blocks. The refurbishment project was generated from a competition, with the winning entry proposing a much heavier refurbishment strategy, however due to technical issues this could not be realised. The built refurbishment modernised the aesthetic of the forms as well as improved environmental sustainability.

The large imposing blocks are 10 stories tall and 125 metres long. These proportions resulted in an intimidating presence from the surrounding ground plane. This coupled with the original non-transparent railings and undefined entrance way created in a poorly articulated volume over the space.

The approach to the refurbishment resulted in a much lighter treatment of the façade and a more optimistic ambiance within the area. Material and colour palette played a large role in the improved atmosphere, with the long facades replaced with highly insulating glass panels and a new brighter material treatment. The previous steel and concrete balustrades have been replaced with transparent glazed overhands with aluminium framing. Original patterning on the façade has been maintained through the use of transparent and translucent glass creating visual interest.

New insulation has been installed on the head walls and the roof, with new brick walls covering the short facades. The roof has also been fitted with solar panels and a new central heating system installed to improve the ecological sustainability of the structure.

An important addition to the refurbishment has been a new entrance foyer. The protruding glass box from the ground floor of the building acts as a beacon at night time with up-lighting illuminating the transparent facade. The light improves visibility and feelings of safety while the glass allows for passive surveillance through the foyer. The previous concrete awning was removed, opening the under-passage through the building to add more light.

The non-invasive refurbishment of the building was undertaken due to the restrictive nature of the budget. The design was decided upon through consultations with the residents of the building, with none of them being required to move out while the works were taking place.

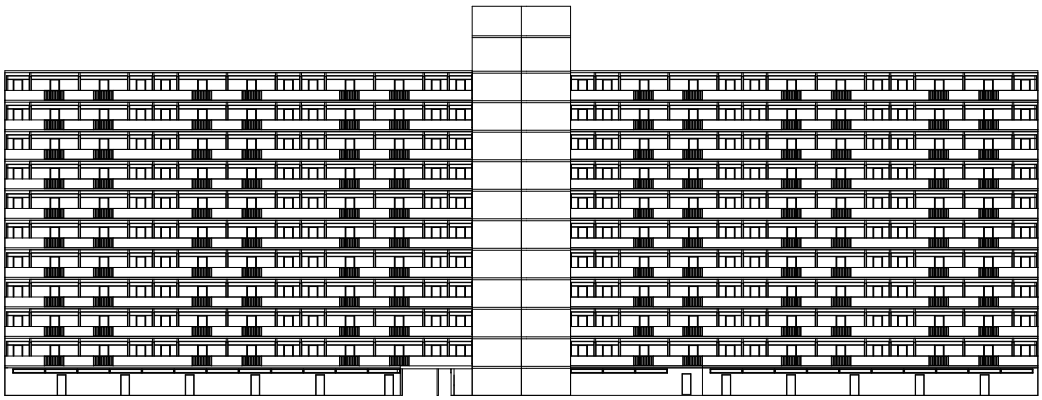
New Facade

Old Facade

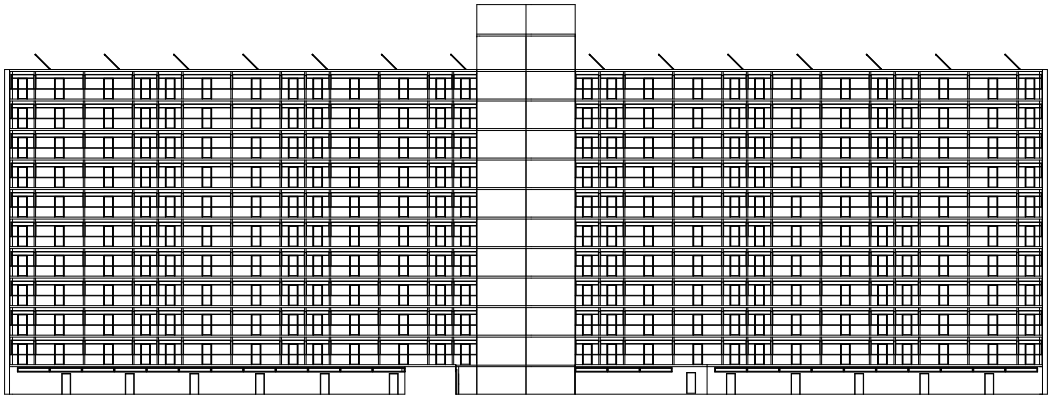
View from Ground Plane

Before Refurbishment (Photo Courtesy of Atelier Kempe Thill)

After Refurbishment (Photo Courtesy of Atelier Kempe Thill)



Original Facade Pattern and Transparency



Refurbished Facade Pattern and Transparency

Interview:

Interview with Oliver Thill of Atelier Kempe Thill Architects at their office in Rotterdam.

Why is the refurbishment of social housing important over the demolition and rebuilding of the estates?

It's difficult to say because I think the discussion is not very ideological or emotional. The problem is all these estates are built at a certain moment, very often with similar technology but they are realized in different places with their own context. It's very difficult to come up with a general reading of this kind of issue, if you look on a place you have always to consider all the social and economic values and decide on the basis of the individual project. It's very difficult to say a renovation is a good or bad option, it is dependant on a lot of different factors.

An important factor is, are the apartments used or not? If you have buildings that inhabited then there's a reason to renovate because you have a certain positive social context that you want to keep. If there are social problems then this could be also a reason to demolish as that can be a complicated situation. But if buildings are in use and the social relations between the people are fine this can be the argument for refurbishment.

Another issue is the urban regulations. If you have a social housing estate, very often they are relatively tall, maybe 10-12 stories. Looking at the urban regulations, you can have a situation that if you would knock down the housing estate, you are not allowed to build as high anymore. We have projects that we renovated because of the fact that if they were to knock down the project, they could never built the same amount of apartments. So then it's more sort of economic argument.

The third aspect that is always important is the technical state of the building. Very often there are technical problems, mostly surrounding insulation and noise problems between the apartments. You can only decide after a quite precise analysis. In Western Europe the working force is relatively expensive, so a refurbishment can also be quite expensive. If you want to renovate a project, you can have a situation that it is more expensive than knocking it down and building a new one. This is not always the case however.

Another factor to consider is the ecological footprint as in most cases refurbishment is more sustainable than a knocking down and building something new. Because you can reuse the construction, you have a smaller C02 footprint, less movement of materials and so on. It's a variety of aspects that you have to consider. I think is a bit dangerous to take an ideological position, we are more pragmatic, more operational and look at all the different aspects to decide on renovation or demolition.

As you have undertaken a number of renewals, did you approach each building with similar strategy and arrive at a different outcome, or approach each individually?

Very often the strategy is similar, but outcome is quite different due to the aspects of social issues, urban planning issues and the quality of the existing structure. We believe that these kind of areas deserve a second chance.

When you look at the situation in the 1920s and 1930s, when modernism came up, housing estates were extremely inspired, the architects really tested new ideas. Then in the 1950s to 1970s modernism switched more to something more similar to production. So it was very technocratic and was taken over by building companies. While they realize modernistic housing estates, the imagined qualities by the architects got lost. We always believe if you renovate these kind of estates, the estate should get a second chance and you should bring in the modernistic ideas again. We always try to make bigger windows, bigger outside spaces and better relation with the public space. We try somehow to keep the modernistic ideas but bringing in more daylight and the more relaxed way of living. Very often that goes also together with a certain idea of adapting the buildings to changes within society.

I think the main issue is that in the fifties and sixties most of these housing estates were planned for the nuclear family, a man, his wife and two children. If you look nowadays on the European housing market, you see that the nuclear family only represents probably 20- 25 percent of the total amount of users of apartments. What we try to achieve is a sort of differentiation. That means we try to offer a variety of different types within these structures because of the fact that we think it's necessary. We also think the variety can help the buildings perform better socially. That you have not only one group of people, but you have a sort of a more relevant mix.

For the rest of the strategy it's always about the issue of sustainability. It's very much about energy performance and adapting the apartments for disabled people and the more technical aspects, but we always start with modernist ideals. We are not interested in fragmenting or destroying these ideals.

Long Deck Access with New Material Treat-

Refurbished Lift Core and Facade

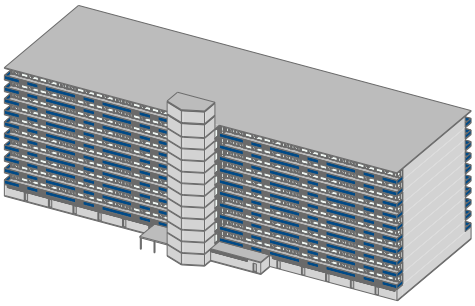
Entrance Foyer

Entrance Foyer

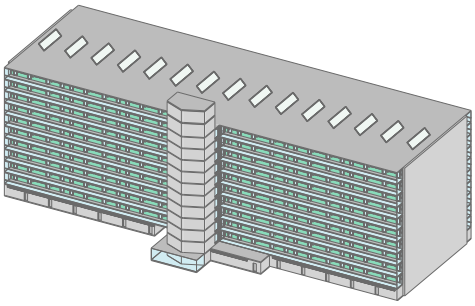
What role did materiality play in your project? Was glass used to modernise the image of the buildings?

Mostly we do not start from the materiality, mostly we start from the spatial qualities. So we always think about the relation between inside and outside. We tried to imagine a lifestyle where the interior is not separated from the exterior. This means lot of glass, large outside spaces, sliding doors, fresh air and sun. The other thing is that we always start from the public space. This is because we know that there are very often problems with the integration of the buildings into public space. So we try to strengthen this relationship because we believe that when the integration between the building and public space makes the buildings perform much better socially. These are the two aspects we try to focus on.

How it looks in the end very much depends on the on the budget. That's a very important aspect. What is interesting about these postwar housing estates is that they are built based on repetition. This can be interesting in relation with the building costs because you can use the repetition as a starting point for the design. If you use elements that you repeat then building costs go down. So we always start to try and work together with producers to find out how we can achieve a maximum of quality within the often limited budget.



Original Building



Refurbished Building

Un-refurbished Building within Estate Area

View from Adjacent Street

View from Ground Plane

Short Facade with New Brick Wall

View from Adjacent Street

Un-refurbished Building within Estate Area

Refurbished Building within Estate Area

Does post war social housing have an image problem?

Yes, there is an image problem, often due to media's focus on the social problems of post-war housing estates. The media often make a direct link between social problems and architecture, when is in reality that not the case. There are a lot of post-war housing areas that are in the middle of the city centre in a good location where there are no problems at all. It's very often the social problems come with the fact that they are on the edge of the city where there are no jobs, there's no public transport and so on. The link between the image of the housing estate and the social image is not very direct. A lot of people who do not live there believe that there's an image problem, while the people that lived there, they often see no problems. Of course there are problems produced by the architecture, including the lack of discussion and relationship to public space, scale issues because the projects are too anonymous, but I would say the image problem is more in our head.

When you look on the global scale, look at social housing for instance in Hong Kong, there are hardly any social problems at all. Also in Paris there are a lot of social housing estates that are performing very well in the city centre. When you are on the periphery, everything is a bit more complicated. There are also social problems in housing estates with low rise housing. When you look at the UK, there are a lot of housing estates with terraced houses with enormous social problems. It's quite obvious that this has nothing to do with the architecture, there are a lot of other aspects that play a role. Of course you have to somehow deal with the scale also that most of the housing of the estates are more anonymous. As well as this you have to work on the relationship with the ground floor, but I believe that you can transform a lot of the post-war housing estates into very well functioning parts of the city.

What is often forgotten is that they belong to our history. A lot of these areas are now 50, 60 years old and they represent the values of a certain period. Its interesting to see them as a sort of monument. It says a lot about time and the changes within society and the view of what a better life could be. These housing estates represent the dream of realizing a better life for everybody. It was very much architecture for the masses. Nowadays architecture is becoming more and more something for the rich.

Case Study 5:
Multiple works by Lacaton and Vassal

Location: Paris / Saint Nazarie / Bordeaux, France

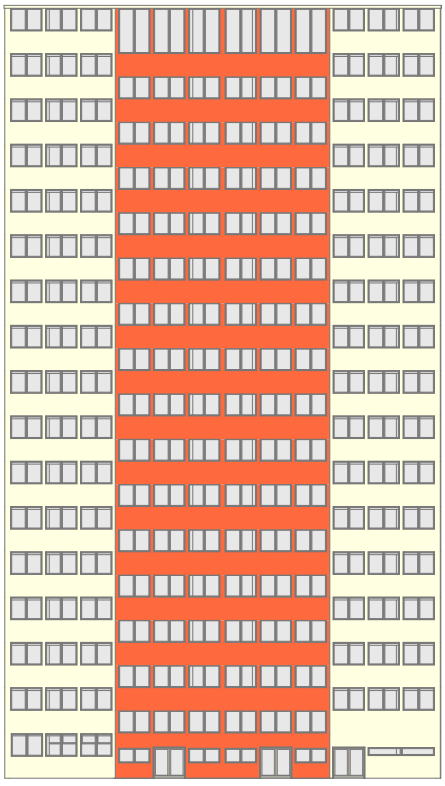
Architect: Lacaton and Vassal

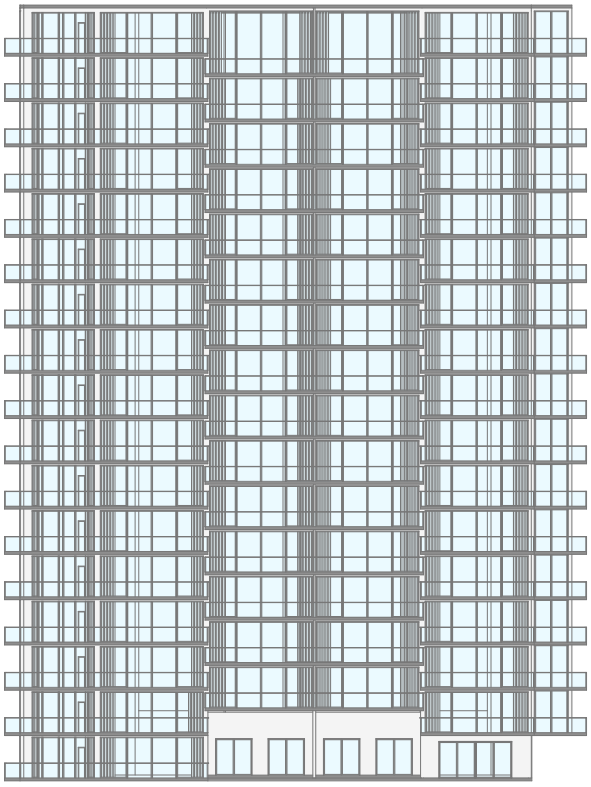
Year built: 1962 / 1970s / early 1960s

Year refurbished: 2011 / 2014 / 2016

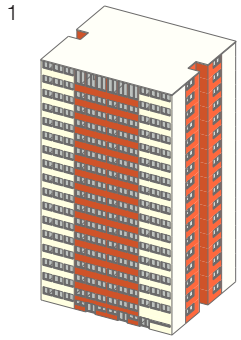
Stories: 16 / 10 / 12

Lacaton and Vassal have pioneered the field of social housing refurbishment with their manifesto, “Never demolish, never remove or replace, always add, transform, and reuse!” The completion of multiple projects has set a precedent for the versatility of modernist social housing buildings now and into the future.

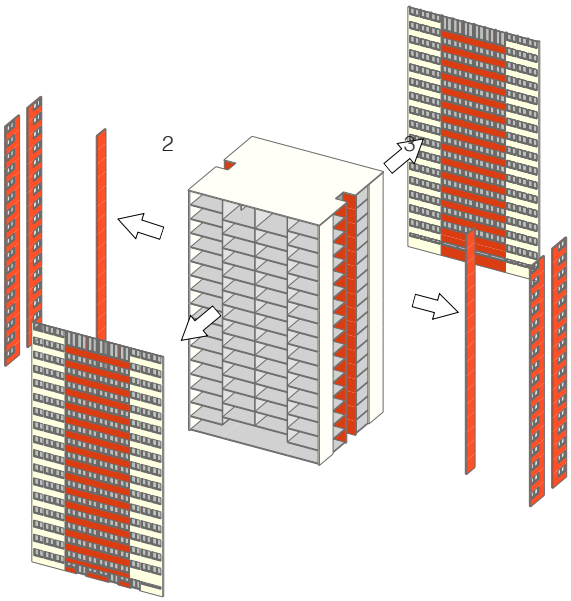




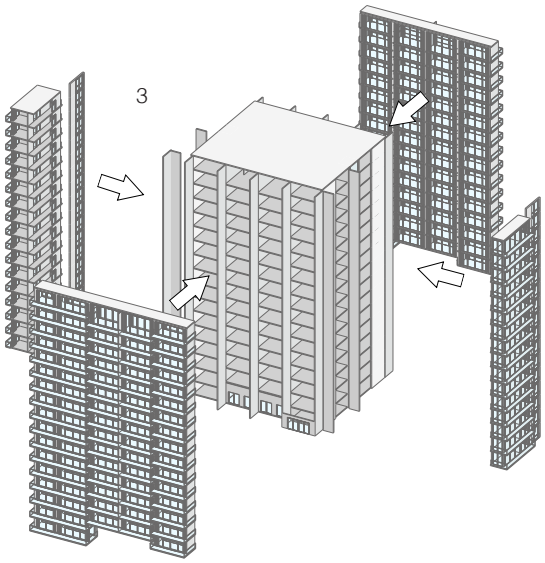
Project Name: Tour Bois Le Prêtre



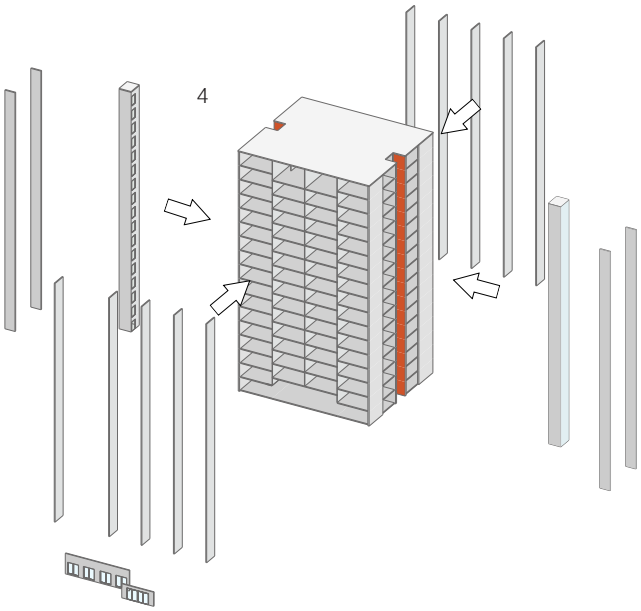
Original building



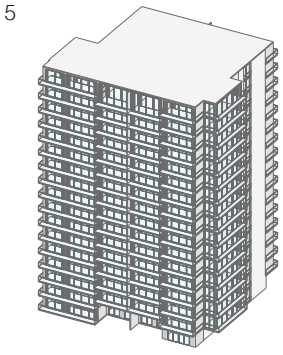
Remove facades



Add new winter gardens



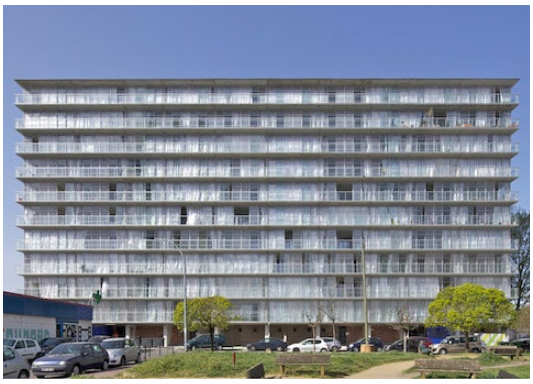
Add new lift cores, entrance way and



Refurbished!

Tour Bois le Prêtre, Paris before and after renovation (Photos courtesy of Lacaton and Vassal)

La Chesnaie, Saint Nazarie before and after renovation (Photos courtesy of Lacaton and Vassal)



G Block, Bordeaux before and after renovation (Photos courtesy of Lacaton and Vassal)

Analysis

Lacaton and Vassal have pioneered the role of refurbishment of modernist social housing within France and around the world. Their first project, Tour Bois le Prêtre, is an exemplary project that was born from an in office study, Plus, conducted by Frederic Durot, Anne Lacaton and Jean-Philippe Vassal.

The office has completed three social housing refurbishment projects on buildings throughout France. These include Tour Bois Le Pretre in Paris, La Chesnaie in Saint Nazarie and G,H and I Blocks in Bordeaux. While the projects vary in scale, a definable material palette and similiar spatial outcomes are a common theme tying the projects together.

The works each remove a portion of the facade of the building and use a modular system to create a shell and extend space. The extensions include a combination of addition dwellings, interior space, winter gardens and balconies. The increased space and light improve the overall amenity of the apartments as well as providing connection to the outside.

The priority and the underlying ethos of the projects is to improve the existing urban condition before creating new forms. Each project priorities community retention with none of the tenants required to move from their flat while the works are being completed.

The modular design of the extensions severely reduces the time of construction, and in the case of the projects in Bordeaux and Paris, each balcony only required a days labour to install. Each project has its own distinct facade patterning resulting from floor plan layout. The modular design results in a strong horizontal pattern dominating the facade, with the lateral lines softened by vertical strips from the framed glazing.

The combination of the two creates a subdued grid broken by the opening and closing of operable windows to

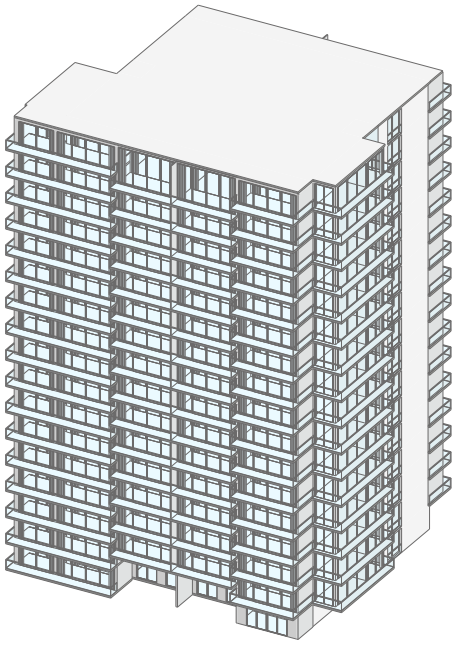
the winter gardens. The boundary of the modular units dissolve when connected, providing a stacked formation, punctuated by thin slab lines that run the face of the building.

The clean, muted colour palette combined with shimmering thermal curtains provide a direct contrast to the original heavy concrete constructions. The use of steel, concrete and glass, while improving the aesthetic value of the forms, were chosen based on pricing and function.

The modernist ethos of ‘‘form follows function’’ is continued through the use of steel and glass to maximise light penetration into the apartment. The choice of operable corrugated plastic windows over the winter garden provide privacy for residents while diffusing natural light. Corrugated aluminum paneling covers portions of the facades untouched by the extensions. The reflective material effectively dissolves the massing of the buildings muting their impact on the surrounding space. The untreated concrete columns and pillars elegantly connect to the ground plane framing a storage spaces and new entrance ways. The materiality of the pillars highlights the context of the original form while only being visible from the ground plane, reducing the visual impact on the skyline.

Users gain the ability to dictate the level of connection and activation with the outside, with sliding paneling and thermal curtains allowing the user to control the level of light, privacy, wind and noise within their apartment.

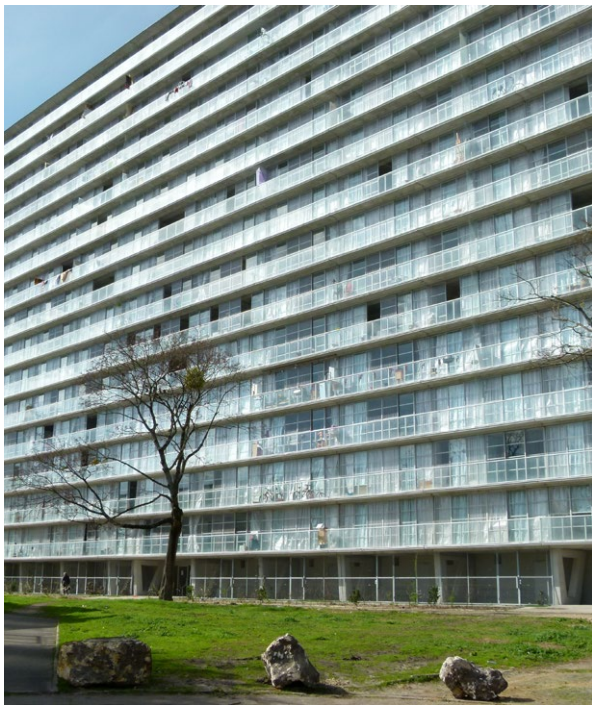
The works each began with the same understanding as the apartment as a home. The generic approach of the refurbishments presses the individual for improvisation to bring elements of human life to the space. Provision of non-programmatic area within the apartment allows for self determination in the use of the space. Highly standardised production methods of the module create an unspecified canvas for the investment of the individual into their dwelling. This investment strengthens a sense of ownership of their apartment and positions the apartments as projects in which the user can participate and plan for now and into the future.



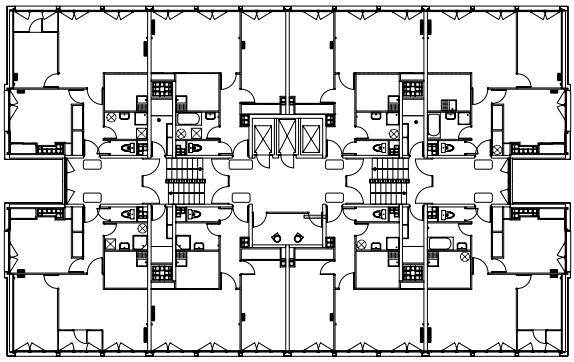
Refurbished Building, Paris

Extended space, Saint Nazaire

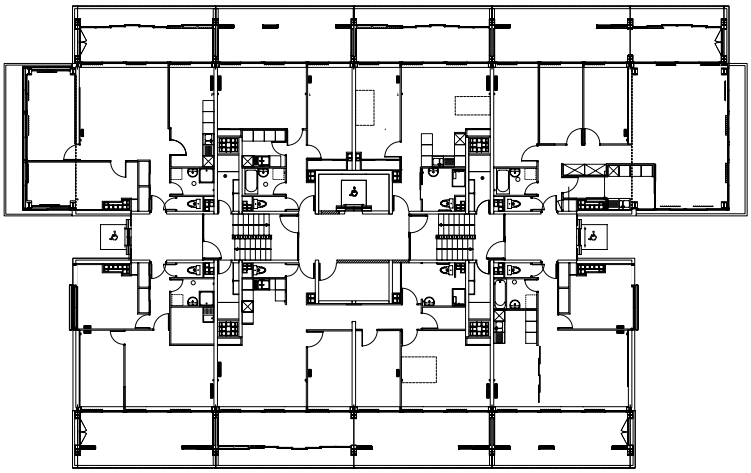
Thermal Curtain, Bordeaux



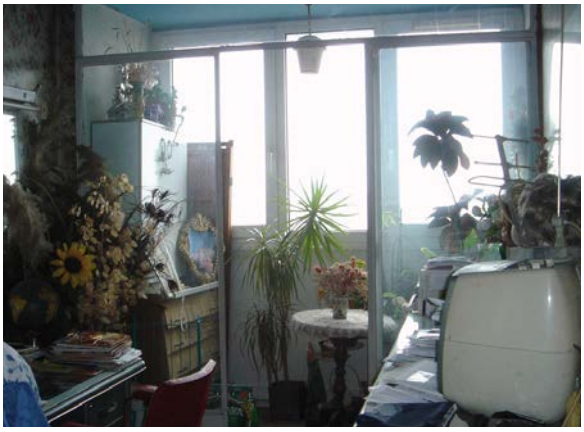
G Block, Bordeaux



Floor Plan Before Renovation



Floor Plan After Renovation



Apartment before Renovation
(Photo courtesy of Lacaton and Vassal)

Apartment after Renovation
(Photo courtesy of Lacaton and Vassal)

Project Name: Transformation of Housing Block, Tour Bois le Prêtre
Location: District 17, Paris, France

Tour Bois le Prêtre provided the foundation for the work by Lacaton and Vassal. The building comprises of 16 stories which includes 96 apartments. The extensions increase the energy capabilities and amenity of the apartments. The refurbishment consisted of extending each apartment by 22m2. The self supporting structure extends the living rooms, creating closeable terraces and balconies. The existing facade with small windows was removed and replaced with large transparent openings.

The previous entrance way has been shifted back to create a sense of arrival, with the doors being framed by a concrete platform and columns supporting the extensions above. This small set back in the facade coupled with landscaping improves the buildings relationship to the ground plane. The lobby has been reconfigured and painted bright green as to contrast the colour palette of the extensions.

The original floor space of 8,900 m2 has been increased to 12,460 m2 through with the addition of the extentions. Apartments on the North and Southern facing facades have been extended with internal rooms, almost doubling the floor space of the apartment.

The energy consumption of the building has been reduced by 50% due to the passive heating and cooling achieved by the winter gardens.

Access Path, Paris
(Photo courtesy of Lacaton and Vassal)

View from Surrounding Street, Paris
(Photo courtesy of Lacaton and Vassal)

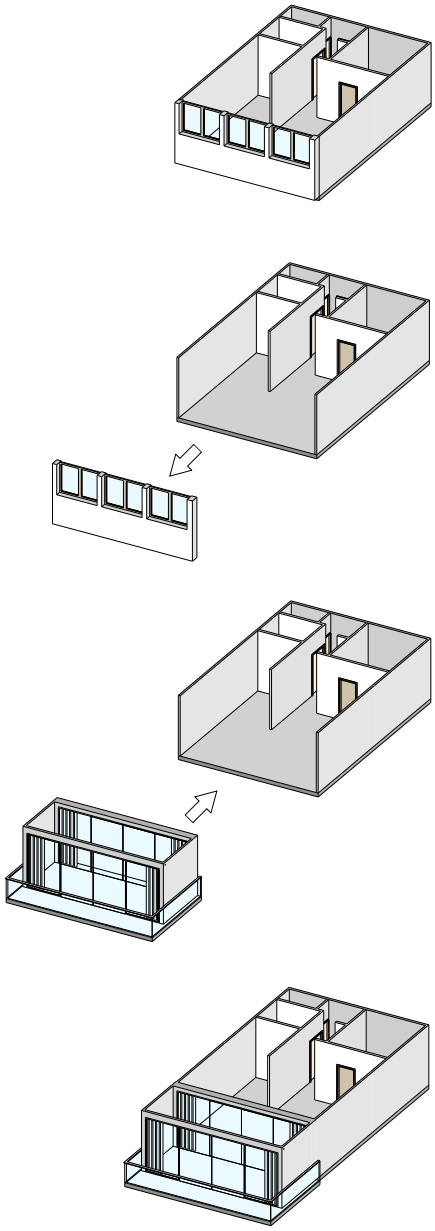
Project Name: Transformation of 530 dwellings, block G, H, I
Location: Grand Parc district, Bordeaux, France

The transformation of 530 dwellings in Grand Parc district, Bordeaux is the largest scale intervention completed by Lacaton and Vassal. The improvement of 3 large tower blocks has been achieved by the extension of interior and exterior space, similar to the project completed in Paris. The original facade again consisted of a heavy concrete construction broken by small sunken balconies.

The history of the area influenced the necessity of an architectural refurbishment. While originally built on the outskirts of Bordeaux, urban expansion meant that Grand Parc is now in a central location in the city. The inclusion of the buildings onto the UNESCO world heritage listing meant demolition of the site was now impossible.

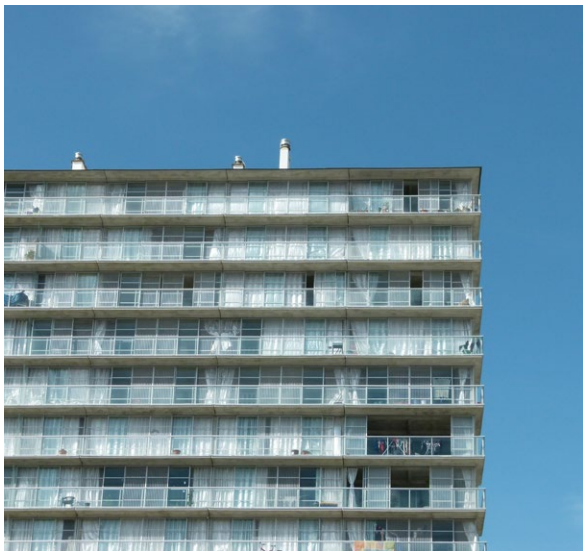
The three buildings form an entrance threshold from the old town of Bordeaux to the wider Gran Parc estate area. The buildings are a visual signifier of the dominant typology within the area and their aesthetic value has significance in the perception of the suburb. The once aging painted concrete facades now provide a distinct characteristic for the buildings and surrounding ground plane. The extensions take advantage of the height of the buildings in context to the old city of Bordeaux. Balcony extensions have undisrupted views over the historical city.

The connection to the ground plane has been improved through the use of landscaping and increased entry points. Four additional vertical access shafts have been externally fixed to the rear of the structure of H and I block. These points connect directly to the adjoining car park behind the buildings. Along with improved access the extensions remove the main entrance from the street from, providing a sheltered entry passage framed by structural columns. The rhythm of the supporting columns also removing create pockets of space on the ground floor for bike storage and waste management points. The entrance ways have been connected by a long well-lit walkway running parallel to the facade of the buildings.

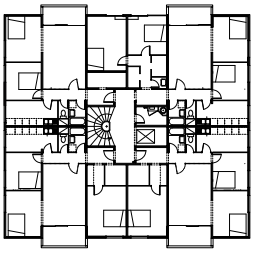


Refurbishment Strategy

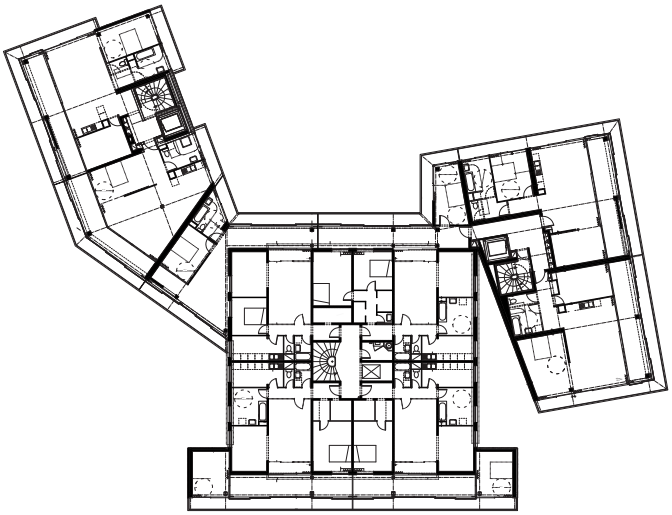
Typical Non-Refurbsihed Building in Estate Area



Renovated Building



Floor Plan Before Renovation



Floor Plan After Renovation

Extended space, Saint Nazaire

Project Name: La Chesnaie Housing Transformation
Location: La Chesnaie, Saint Nazaire, France

The district of La Chaisne in Saint Nazaire represents a typical urbanism of the 1970s with multiple mid and high rise slab blocks connected by open green landscaping. The 10 story modernist tower that underwent refurbishment originally housed 40 dwellings, with the form of the building consisting of an extruded square with painted concrete facade. Within the building each apartment had access to an unenclosed balcony space and entered the apartment through a central vertical circulation shaft that housed lifts and stairs.

La Chaisne differs from the other two refurbishment projects undertaken by Lacaton and Vassal with the building undergoing a significant altercation of form and floor space. The open space on either side of the building allowed for new structure to be built around the existing volume to housing additional dwellings. The number of apartments has been doubled, to 80, with balcony extensions connecting the new wings. The original apartment's floor space has been increased by 33m2 with the addition of extensions on the south east face. This extra floor space comprises of an extra bedroom, a balcony and a glazed winter garden. The original dwellings have also been reconfigured internally, moving the old bathroom to a bedroom with the previous bathroom becoming storage.

The new wings that house additional dwelling have been connected to the north and western ends of the building. The non-symmetrical layout of the new floor plate veils the original silhouette and contrasts the remaining tower blocks in the surrounding area. The building more than doubled in width with the two new wings having its own entrance point and vertical circulation.

The skewed floor plate presents an opportunity for wide connected winter gardens and outdoor amenity space between apartments. The refurbishment continues the spatial understanding of previous projects with the extension of apartment space through the use of winter gardens, balconies and extra interior space.

The floor plate seeks to amplify the amount of light the apartments receive, with the shape of the extensions conforming to the south eastern aspect of the original form. The logic of the floor plate leaves a triangular opening between the original building and additional wing for light access to the north eastern facade of the existing form. The interior facade of this shape is clad in reflective corrugated metal as to reflect light to the connected interior spaces.

The connection to the ground plane has been improved by multiple access points running through the length of the building. The new lobbies use amble glass and wide empty areas to promote passive surveillance.

Interview

Interview with Julien Callot from Lacaton and Vassal at their offices in Paris.

Lacaton and Vassal is often regarded as pioneers in the movement to refurbish modernist social housing buildings. How did this idea and these projects come about?

The project began as a study that was conducted here at the office, with Frederick Drout, on how to proposal something different for the existing social housing buildings from the sixties to the eighties, as the usual policy is to demolish and to make something new. It was published as a book called Plus, but this was first a study inside the office before being made into a book.

We as architects should be able to make other proposals and take advantage of the existing. The existing has different aspects, some people don't like how they look, but these buildings have positive qualities. The structures are strong, there's always a good ventilation systems, most of the time when we asked the inhabitants, they say that they have enough space and light inside the apartments. Also the ground plane is interesting because these buildings were built outside of the cities where there was a lot of space. It can be seen as an opportunity to know that the city has grown, to make better use of the spaces that are often just parking lots or left empty, also to speak about the density of the city and how it could evolve.

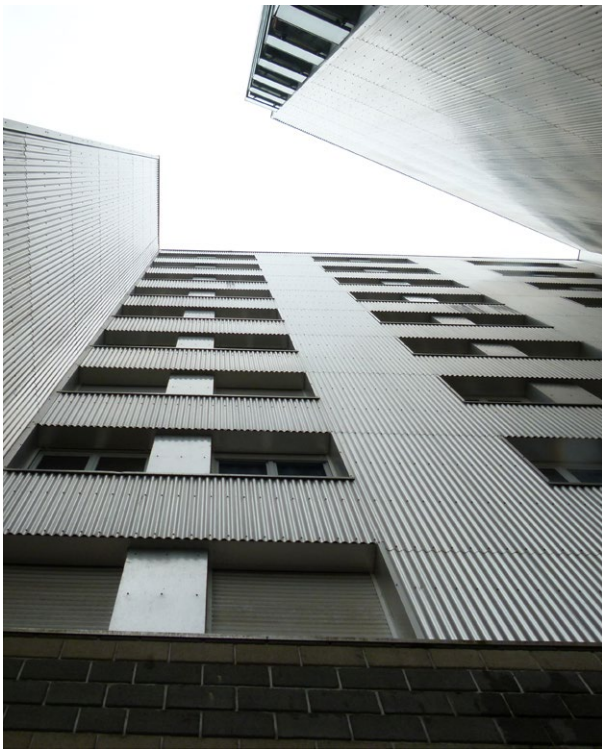
The three projects we completed were coming from this initial study, the first one was the Tour le Prete. That is in a special situation because it's in Paris where it is difficult to find housing. There was not much space around the entry and the inhabitants had problems in the tower, but they didn't want to leave. It was also a special tower because it was more architecturally interesting than most of the construction that was built in that period.

Then the second project was in San Nazaire, which was smaller to work on, only 10 stories high. What is different in this project is that we also built new dwellings, in fact we double the number of dwellings in the tower, so it's really changed the way the building works.

The last one is in Bordeaux. This project is at a larger scale, a very long block with a 530 dwellings. It was very interesting because these two projects in San Nazarie and Bordeaux, are a typical construction in France. They are very heavy, mainly being designed to be constructed in concrete with very repetitive forms, they are not made to be flexible or to evolve. It was a good test to see if the proposals that we suggested were relevant.

In the three projects the key was always to think about the inside of the dwelling itself, how the inhabitants would live.

Entrance way, Saint Nazaire



Light well, Saint Nazaire

Extended space, Saint Nazaire

H Block, Bordeaux

Extended space, Saint

G Block, Bordeaux

Stacked Facade, Bordeaux

Why is the refurbishment of social housing buildings important?

I think it is important that we as architects show engineers, building owners and others that if we want to work on living comfort and the way people feel in the city, then we should first work on the existing. We should start by seeing if we can make what we have better. Secondly in France we have an objective to save more energy, and again we should work on what is already consuming lots of energy. We cannot demolish everything and make everything new. There are too many dwellings, its too much work and not really possible. We need to make cities better for everybody.

Another aspect of keeping the existing is that these dwellings are inhabited, there are people that enjoy living in their homes. Sometimes there are problems, but it's really more interesting to deal with these problems than to remove the people that live there. I think most people understand and agree with refurbishment, but they have habits and it's easier to communicate and to speak about a project when it's building something new instead of refurbishing something old.

We achieved refurbishment with these three projects and we hope there will be others, but it's not really significant considering the number of existing buildings that are being demolished in France right now. We haven't yet passed the critical point from creating something that is exceptional. While we have completed a few a refurbishment works, we have to make many more to get to this critical point that it becomes the first idea. First asking "how can we use what the exists and make it better?"

When looking at tower re-design there are various scales need to be taken into account. How did you manage the scales to produce the best outcome?

I think we made the choice by doing earlier studies with Jean Phillip who always made the conclusion that the most interesting scale to begin with was the scale of the dwelling itself as it is most relevant to living in a place. To make it comfortable we began to think of each apartment as if it were an individual house. This is the most important scale we try to work with. The solution dealing with other scales came later with further studies, through developing the project. However we would always refer this initial foundation, the foundation of the house as a unit.

Do I think we should have been afraid to deal with such big buildings? I think that large scale is what you see the most when you take pictures, but we don't make architecture to take pictures. The large scale of the building is not the most relevant scale for everyday life. The way people use the balconies and the winter gardens, it's really changing the building itself at a larger scale. I think it's very interesting to see these changes.

I think that if we would have thought about the largest scale at first we would not have designed as many outcomes for the inhabitants and in the end it would have resulted in a lack of sensitivity in the design. However in saying that there are a lot of things to do on the outside of the building, we have only worked on the building itself and there is a lot of space on the ground plane to improve.

Were there technical restrictions placed on the design by the current form? If so how did this affect how the project's outcome?

We don't see the technical problems as restrictions but as abilities. If the structures can have two metre or four metre balconies it's not a restriction, it's a tool and a means to add to the existing. It is always a plus, never a minus. There was no restrictions coming from the extensions. We had some technical issues coming from asbestos, but that was dealt with.

We don't stop the project and make changes to the design because of technical issues, if we don't know how to deal with it we can find some who does. It's having a strategy from the beginning which is able to anticipate and deal with technical problems.

Winter Garden and Balcony, Bordeaux

Structural Columns, Bordeaux

Framed Entryway, Bordeaux

Access Path and Landscaping, Bordeaux

There seem to be similar outcomes from each refurbishment project. Do you approach each project with a similar formula or do you see each project as an individual?

Each project is individual, however we are specialist, we are architects, so we use our experience from all the projects we have done. In the beginning, we worked on the study and found something comfortable. We thought about these buildings and we asked ourselves what do we need to make this building feel the same as the others we liked.

The balconies and the winter gardens are not something that we want to do every time, however it happens to be something that improves the comfort of the apartments. It would be nonsense to not use the best outcome for a project even if we don't want to repeat ourselves. After we completed the first project, we found another place where it seemed relevant to reuse the same elements, so we had to. It was more like a toolbox to draw upon.

Do you see each building fit into a wider project to implement social housing refurbishment throughout France? Are these the seeds of a movement where it becomes normal to refurbish modernist social housing?

Yes. I think the most important is not implementation method of adding extensions, but trying to keep the existing and to first see what is working well.

I think that is what these projects represent, that should always use existing buildings. Re-use should become the first move, to find a way to keep the what we have and improve on that.

Apartment before Renovation
(Photo courtesy of Lacaton and Vassal)

Apartment after Renovation
(Photo courtesy of Lacaton and Vassal)

Building Form, Saint Nazaire

Building Form, Bordeaux

Operable Thermal Curtain, Bordeaux

View over the city from Tower, Bodeaux

4

Applications in Local Context

When applying the lessons learnt to a local context, Sydney's social and private housing landscape is in a transformative period. There are many opportunities to apply the lessons learnt from refurbishment within Sydney, and the current planned demolition of Waterloo estate in Sydney's inner city provides an excellent case study for the possibility of social housing retention. This case study aims to understand the impacts that a refurbishment would have in light of Waterloo estate's planned demolition. The comparative study intends to see whether a refurbishment of one building, Matavai tower, on Waterloo Estate is viable. The scope of the case study was set at one building to reduce the possible variables when considering outcomes regarding building condition, community unity, and urban, financial and health impacts.

Sydney Housing Landscape:

Sydney, like many cities around the world, finds itself in a housing crisis. On average Sydney's population increased 4.95% from 2012 – 2017 (81) creating demand for housing, particularly in the city centre. As a result the housing market in Sydney has seen a rapid increase in the last decade with the average house price appreciating 44% from 2008 to 2018. (82) This growth in price has left many people priced out of the market, with the city beginning to further divide based on socio-economic lines. (83)

As a response to the housing crisis, the NSW government has encouraged large swathes of private housing to be built. Sydney is one of the least dense cities in the world, with a density of 36 people per hectare in 2011, compared to 80 in London and 186 in Madrid. (84) The low density has provided an opportunity for the NSW government to re-zone many industrial and commercial sites near transport routes, and since 2014 NSW Department of Planning and Environment has identified 28 "priority precincts" for high density development. (85) Between 2012 and 2015 NSW saw 78,000 units approved, roughly an 18% increase in stock, (86) with further plans announced in 2016 to build 184,000 new homes by 2021. (87) The goal of increasing the dwelling numbers in Sydney is to house the increasing population and decrease the stress placed on the market.

This push for increased density of private dwellings and increased land prices has had an impact on the future of centrally located social housing. Sydney is seeing a reduction in the concentration of social housing in the centre of the city in favour of private dwellings, as seen with recent sales of public housing in Millers Point and Sirius Building at the Rocks. In response to the reduction of centrally located social housing, the NSW government plans to build new state-owned housing in Condell Park, Padstow, Chester Hill, Yagoona, Kingswood, Beverly Hills, Casula, Gymea, and Miranda, all suburbs located in the inner and outer southwest zones of the city. (88) Currently Sydney is the most spatially segregated city in Australia, with high and low-income earners concentrated in different suburbs. (89) The reduction of centrally located social housing increases the economic segregation of the city and predisposes residents to the negative effects of spatial inequality. It is important to protect cities from being ruled strictly by economic forces as spatial inequality impacts the social cohesion of a city. Social housing refurbishment presents the opportunity to main-

tain current levels of social housing in central locations and reduce the impacts of spatial inequality.

NSW Social Housing:

Within the context of NSW, social housing is an umbrella term which includes public housing, community housing, state-owned and managed Indigenous housing and Indigenous community housing. The following terms have different ownership structures and are managed by different groups. As of 2017 there were are 152,231 social housing dwellings in NSW. (90)

The forms of social housing are defined as the following:

Public housing: dwellings owned (or leased) and managed by State and Territory housing authorities. It is generally accessed by people on low incomes and/or those with special needs, and aims to provide a choice of housing location, type and management arrangements. As of 2017 there are 110,221 public housing dwellings.

Community housing: rental housing provided to low-to-moderate income and/or special needs households, managed by community-based organisations that lease properties from government or have received a capital or recurrent subsidy from government. As of 2017 there were 34,398 community housing dwellings.

State owned and managed Indigenous housing (SOMIH): dwellings owned and managed by State and Territory housing authorities that are allocated only to Aboriginal and Torres Strait Islander tenants, including dwellings managed by government Indigenous housing agencies. As of 2017 there were 4608 SOMIH dwellings.

Indigenous community housing (ICH): dwellings owned or leased and managed by ICH organisations and community councils. ICH models vary across jurisdictions and can also include dwellings funded, managed or registered by the government. ICH organisations include community organisations such as resource agencies and land councils. As of 2017 there were 3004 ICH housing dwellings. (91)

In the last decade there has been a change in the provision of social housing through increasing the number of community housing dwelling and a decrease in public housing. From 2005- 2015 there was an 11% decrease in public housing and a 334% increase in community housing dwellings. (92) The rapid increase of community housing has slowed in the past years, and as of 2018 community housing represents 19% of the social housing stock within NSW. (93)

The quality of NSW social housing has been under scrutiny recently, with the 2018 Productivity Commission Report on Government Services finding one in four public housing properties were in unacceptable condition. This was defined as having less than four working facilities, for washing people, washing clothes/bedding, storing/preparing food and removing sewerage, and more than two major structural problems. NSW had the highest percentage of properties in unacceptable condition in the country. (94) These figures points to the necessity for many social housing dwellings to undergo renewal, whether that be refurbishment or demolition/rebuild. Currently the Government cannot cope with the demand

of social housing within NSW. As of the time this study was completed there were 55,949 applicants waiting for social housing in NSW. With the wait times for social housing up to 10 years in many parts of the state. To address the demand the NSW government has pledged 27,000 social and affordable homes over the next decade. However, it has been reported 17,000 of these will be replacing existing homes, meaning roughly 10000 dwellings will be available to address the growing need. There has been sharp criticism of the NSW government as to the lack of provision of new social housing. With suggestions that the new 10000 dwellings will do little to aid in reducing the back log of applications. (95)

Waterloo History and Context:

Waterloo is located within the inner city of Sydney south of the CBD only 3km to Sydney Town Hall. As of the 2016 census it was home to 14,616 people. (96) The suburb has undergone mass changes in its history with the introduction of the Waterloo estate in the 1970s signifying a major development in the character of the area. The area is of cultural significance to Indigenous Australians and is the traditional home of the Gadigal people of the Eora Nation. The area boarders Redfern and is near ''The Block'' which has a rich history as a key representation of Indigenous land rights and self-determination in Australia. Currently 3% of the population of Waterloo identify as Aboriginal and Torres Strait Islander. (97)

The Waterloo Estate was the solution to the poor condition of housing in the Redfern/Waterloo area in the mid 1900's. Under the County of Cumberland Plan, 1948-1951, housing in the area was demolished to make way for a high-rise modernist housing estate. (98) The estate was officially opened by the Queen on March 14th 1977. When it was first opened the rent in Matavai and Turanga Towers was set at $8.80 a week for a single unit and $13 for a double. (99) The estate is comprised of two 30 story towers, Matavai and Turanga, and four 16 story tower blocks, Cook, Banks, Solander and Marton. The urban design of the estate is a representation of late modernist understanding, with large apartment blocks arranged within a landscaped setting. The estate covers 18 hectares of land and currently home to roughly 2500 residents.

Waterloo Masterplan:

Announced in 2015 by the NSW Land and Housing Corporation in conjunction with UrbanGrowth NSW Development Corporation under the Communities Plus Program, the Waterloo housing estate area is to be redeveloped with mixed tenancy housing and increased housing density. The development of Waterloo estate currently exists in three different master plan options. The master plans vary in scope, height and density however do not retain any of the existing buildings on the estate. Previous instances of the master plan included the retention of the two largest towers, Matavai and Turanga, however this has been removed on the most recent iterations. The current density ranges from 6500 to 7200 dwellings within the estate grounds. The plans aim to introduce mixed typologies into the area with as many as twelve 31-40 story towers. The goal is to achieve a mix of 30% social housing with 5% affordable housing, meaning 65% of the remaining housing, 4225 – 4680 apartments, will be sold on the private market. (100)
The following statements have been released by NSW

Land and Housing on the redevelopment of the area:

• The redevelopment of Waterloo will be staged over 15-20 years.
• There will be no loss of social housing. The redevelopment will deliver more and better social housing to the area.
• It is anticipated that the first residents who need to relocate will not have to move until late 2019. Residents will be given 6 months' notice before relocating
• All current social housing residents have the right to return to the Waterloo estate.
• FACS will start the redevelopment in low density areas.
• Enough social housing will be built at the start of the redevelopment for relocated residents to move back into brand new homes on the estate.
• The redevelopment of Matavai, Turanga, Cook, Banks, Solander and Marton buildings will be staged last. Residents in these buildings will not need to move for at least 10 years.
• At least 5% of new residential dwellings will be delivered as affordable housing consistent with Greater Sydney Commission targets. (101)

There are inconsistencies with the wording of the aims of the scheme. With residents given the ''right to return'' to the Waterloo estate, however also stating enough social housing will be built at the start of the redevelopment for relocated residents to move back into new homes on the estate. It is currently unclear the number of residents who will have to move off the estate before being offered housing within Waterloo. However, a single phase decant is planned for some of the residents. A complete single phase decant would ensure the retention of members of the community who want to stay in the same area.

These current goals go a long way as to retaining the majority of Waterloo residents, however cannot be guaranteed as planning operations are complicated. While the current plan would serve to keep the existing community, it has been seen in multiple examples outside of Australia where promises of social housing numbers are broken to satisfy profit margins.

Community Response and Desires:

To understand community response and desires within Waterloo, a community engagement was undertaken by KJA Engaging Solutions on behalf of NSW Land and Housing corporation. The programme engaged 1570 participants through surveys, pop up information stalls, community days, workshops, engagement activities with the aboriginal community and youth engagement activities. (102) The survey's respondents were a mix of both social housing tenants and other members of the community.

The community engagement report concluded that residents felt the sense of community and Waterloo's history and cultural heritage (including aboriginal heritage) were aspects that made Waterloo unique. There was a strong desire by the community to maintain and strengthen these aspects in the new development. There was value placed on the natural landscapes, with a desire for the development to include ample green space and tree coverage. The residents responded with a desire to have an open, safe, diverse Waterloo heading into the future. There was a desire for enough social services to support

the increased population and flexible communal spaces to facilitate cultural events, festivals and community activities. As for the design of the area the residents wanted architectural excellence to reflect community diversity. There were concerns from resident about homogeny in the build form of the area, with development in close by suburbs of Zetland and Wolli Creek cited as examples of what the residents did not want. There was importance placed on security in the new development, with requests for more CCTV cameras, alcohol free zones and wet areas as well as more lighting in and around buildings. When asked about heir immediate housing environment residents expressed a desire for larger rooms and balconies, more and operable windows, better bathroom design and more storage space.

When considering refurbishment, the report mentions the topic being raised for the retention of Matavai and Turanga towers. There were varied levels of support for the preservation of the towers with some residents considering them an icon within the area, while others considered them outdated.

While the community engagement report paints a picture of optimism in attitudes to the new renewal there has been a large amount of community backlash against the plans to demolish and rebuild Waterloo housing estate. There have been criticism of the lack of information given to residents at early planning stages. Residents have reported the negative impact on their mental health due to not knowing what was going to happen with their housing situation. There have been concerns raised from residents about the movement of the elderly who live in the estate, with 30% of the residents living in Waterloo Estate being over 70 years old. (103) The desire to undergo renewal and live in new homes is not universal with some members of the community showing no interest to live in new apartments.

In response to the proposed development Waterloo Public Housing Action Group (WPHAG) has been established to ‘’fight for Waterloo public housing tenants’ rights and to achieve the best outcome for tenants in the redevelopment of our estate.’’ The community group is run by residents of Waterloo Estate as a point of information and counter to the ‘’social cleansing and eviction from our Waterloo public housing homes and community.’’ The group functions as a point of information for residents about the redevelopment process. They engage by fielding concerns from the community and forwarding them to NSW Land and Housing, translating information for non-English speaking residents, visualising the current master plans for residents to understand, host community engagement events to gauge community desire, and promote tenant rights in the redevelopment of the area.

In conjunction with the residents of both Matavai and Turanga towers an art project #WeLiveHere2017 has been set up in response to their planned demolition. The project has installed multi coloured LED strip lighting in the windows of the towers as a representation of the varied lives and residents who live in the towers. The project aims to give a human face to the buildings by allowing residents to change the lighting colour based on mood. The aim of the project was to ‘’turn an inanimate building into a metaphorical sentient structure’’ (104)

Matavai Tower:

A survey was conducted for this research to gauge the happiness of residents with the design of Matavai tower. The survey spoke with 22 residents, roughly 10% of the people that reside within Matavai. Of the respondents the gender ratio was split 7 women to 15 men. All respondents were residents of the tower and over 55 years old. The survey is referenced in the following case study of Matavai.

Design:

Matavai Tower is one of two identical 30-story towers located within the Waterloo estate grounds. Designed by Stafford, Moore and Farrington Architects in conjunction with Housing Commission's Architects, the towers typify modernism's approach to mass housing and are an important example of Sydney Brutalism. Matavai tower consist of 203 dwellings, including 126 studios, 70 one-bedroom apartments, 6 two-bedroom apartments and 1 three-bedroom apartment.

Matavai and Taranga towers act as a threshold for the entrance to the Waterloo Estate area and frame the connecting Waterloo Green. The strong vertical lines articulated by the floor plate exaggerate the height of the buildings. The bright matte facades, typical of brutalist designs, provide strong contrast to the surrounding tree line and vegetation obscuring the base of the towers. The material palette of glass, beige pebblecrete and aluminum creates a simple repetitive façade pattering on the unadorned concrete masses, punctuated by voids for windows. The repetition of windows aligned vertically continues to enforce the height of the form, with the curved edges of the larger windows counteracting the sharp geometry of the towers. This geometry captures ample light creating stark interplay of shadow and light across the face of the façade.

Inside the Matavai tower the design comprises of small apartments located around two central lift cores with a common passage way wrapping the core, allowing access to each unit. The lifts open onto a communal area looking over the garden towards Sydney city, these spaces are often filled with residents own furniture to relax in the morning sun. On the ground floor the lifts lead out into foyer area connecting the three main areas of social importance in the building, the garden, the letter box room and the concierge area. The garden connected to the base of the building has been fenced off from the public creating a space for residents to grow plants and vegetables. The North West aspect of the tower means the letter box room receives ample morning light and can often be found full of residents waiting for the 11am mail service. Also adjoined to the foyer is a library, community room and amenities area. The entrance and exit of the tower are guided by an extended portico, the only break in the extruded forms unification with the ground plane. Both the towers are serviced by a connecting ring road allows elderly residents to be driven to the entrance of the block.

One resident, Catherine Skipper, wrote of the design and symbolism of the towers – ''At night there can be no more impressive sight than the dark shape of the towers against the city-lit sky, the windows gleaming and wink-

ing, signalling the many, many little worlds secured by these concrete giants...In the stakes for memorability as image the towers are unsurpassed... As a robust visual statement of socio-political commitment to housing the vulnerable, the towers represent an honest, egalitarian vision.'' (105)

Tenancy:

Both Taranga and Matavai towers were originally designed to house elderly tenants. Currently the tenancy of Matavai tower falls under the State Environmental Planning Policy (Seniors Living) 2004, meaning it is exclusively reserved for +55 residents.

Design Strengths:

A report conducted in 2005 by the NSW Department of Land and Housing on the structural integrity of Matavai tower rate the building as ''in a sound structural condition.'' (106) The report was publicly released due to a freedom of information request. As of March 2017, the report was the most up to date structural condition report commissioned by the NSW government. The report's summary does not suggest that Matavai tower is in any need of major structural repairs. The defects and repair suggestions that are detailed in the report focus mainly on general maintenance. The main repairs were located at the roof level which does not impact the overall structural integrity of the building.
A report by the City of Sydney ''Draft Built Environment Plan 2'' in 2011 reads ''The case for retention is strong (sic) in the case of the two 30 storey slimline towers Matavai and Tauranga which were specifically designed for elderly tenants.'' (107) This was in reference to the robust structure of the buildings.

The towers functions very well for its purpose as elderly housing. The ring road leading up to the entrance of the building reduces the level of movement required for less mobile residents. With lifts carrying tenants to their floor, with a maximum of 10 metres to their apartment door. The towers have unique features for the elderly residents, including slow moving lift doors and a call-for-help monitoring system with alarm buttons throughout each unit. There has also been inclusion of arthritic control taps, non-slip 'plunge' shower bases, clothes dryers in units as well as separate clothes drying equipment and air-drying spaces and common rooms on each floor. The buildings has an extensive fire detection measures with smoke exhaust system and lift failure, air-conditioning failure and sprinkler failure monitoring. (108) The internal apartments receive ample light with 83% of the respondents to the survey happy with the amount of natural light within their unit.

The towers have a large amount of common space on the ground level as well as separate communal areas on each floor. There is a good private connection with the ground plane, with glass double doors opening onto fenced gardens for residents. The gardens location on the North face of the building means it receives direct sunlight. The gardens also provide a private set-back for the building from the adjacent street and associated vehicle and foot traffic.

Previously there were issues of security within the tower, however the introduction of a concierge at the entrance

of the building have resulted the improved feelings of safety. (109)

Design Weaknesses:

While the design of the towers function very well as elderly housing, there are design weaknesses with the buildings. The scale of the towers dominates the surrounding visual sky line which creates issues on the ground plane. The 29 story towers run parallel to each other and are offset to reduce cross viewing. The offset means the facades of the towers capture wind often resulting in the ground plane below becoming wind swept. This creates comfort issues in the space around the towers including Waterloo Green as well as in the adjoining gardens. The aspect and scale of the buildings also mean overshadowing of the Waterloo Green for large portions of the day.
As with many modernist social housing designs the buildings do not have good public connection with the ground plane. There is only one public entrance way and the buildings extruded volume intersects directly with Waterloo Green. This creates areas of unclaimed green space around the base of the towers as the definition between public and private is not clear. However, as the buildings role is elderly housing the public connection with the ground plane is not a priority. The single entry allows for open surveillance of the entrance way by the concierge to ensure the safety of the residents.
During the survey most tenants selected and extra room in their apartment as preference if the towers were to be refurbished, suggesting that apartment size could be an issue. As most of the apartments within the structure are 30m2 studios, residents may feel the apartments could be larger. On top of this there is little to no personal storage space within the building. These two factors mean the residents are limited in the personal space they have access to.
When discussing the main issues of living within the towers the majority of respondents included the lack of maintenance and slow response time to issues. There were no responses regarding the design of the building. This points to an overall happiness with the functionality of the form.

To refurbish or demolish?

When considering the retention of Matavai Tower, the previous impact criteria of refurbishment vs demolition/rebuild provides a framework for understanding the viability of each scheme. The following analysis has been build on publicly accessible information and data. More detailed information is required to understand full impacts of either scheme.

Financial:

As outlined previously it is difficult to gain an exact understanding of the financial outcomes of a refurbishment scheme vs a demolition/rebuild. Even with access to data to understand which scheme is less costly over the lifetime of the building, statistical modelling does not provide an exact outcome. To understand the financial viability of a refurbishment or demolition/rebuild for Matavai tower a much broader level of analysis would be needed, with access to associated resources such as quantity surveyors, engineering reports etc. However, some understanding can be gained through the previous criteria set for budget considerations, including markets and prices, maintenance and repair, environmental and project cost of waste disposal and decanting.

• Markets and Prices

Sydney has undergone a huge period of growth in the housing market over the last decade. The average house price in Sydney has increased by 44% with Sydney's Inner West and South seeing a 98.4% increase since 2008. (110) With Sydney's population steadily increasing, a densification of the Waterloo estate could raise revenue and ease housing stress. With the average house in Waterloo currently costing 1,247,500 and average unit cost being 832,500. (111) With the high demand for housing in a central location, a redevelopment of the area including a knock down and rebuild of Matavai tower could create a substantial financial windfall for the government and associated developers.

The master plans introduction of mixed social and private tenancy into the area provides the opportunity to increase revenue through the provision of larger apartment numbers and floor space. The refurbishment of the tower would be restrictive in the ability to provide new apartments.

• Maintenance and repair

As outlined earlier the structural integrity of Matavai Tower is sound. Based on the 2005 report commissioned by the NSW Department of Land and Housing there is no suggestion that there is any need for major structural renewal. It is difficult to estimate the amount of maintenance the building will require over the coming years, however refurbishment could provide preventative maintenance to diminish some of the on-going costs. Due to the age of the building, it is likely that Matavai will require more ongoing maintenance than a new build. The exact difference in maintenance requirements between the two cannot be calculated without more information, however no large-scale structural repairs are needed for the existing tower.

• Environmental and project costs of waste disposal

  Matavai tower's primary construction material is concrete, making up most of the load bearing structural columns, walls, core as well as the pre-fabricated wall panels on the exterior of the building. The cost of waste disposal would be higher in a knock down/rebuild as opposed to a refurbishment scheme.

• Decanting

  As outlined earlier decanting costs and relocation can be very costly for a demolition/refurbishment as opposed to a refurbishment scheme. The retention of the tower would minimise or avoid any decant costs.

It is impossible to completely understand the financial viability of each scheme without further data. The financial viability of the tower cannot be separated from the overall masterplan to increase the amount of housing on the Waterloo estate. The refurbishment of the tower could prove to be financially viable, however a greater understanding of the figures associated with the master plan would be needed. The current plans to not retain Matavai tower could suggest that the demolition/rebuild of the building is a more financially viable option.

Environmental:

There is no publicly available data as to the energy performance of Matavia tower. With current resources it cannot be estimated whether an energy efficient refurbishment would produce less operational carbon emissions than the embodied and operational carbon over the lifetime of a demolition/rebuild. The only environmental outcomes that can be drawn is amount of waste produced by a demolition/rebuild would be higher than a refurbishment scheme.

Community:

There is no public statistical information about the existing community within Matavai Tower. However, there is an extensive tenant survey conducted by Housing NSW Human Services in 2011 as to the prevailing attitudes of the social housing residents in Redfern and Waterloo. The report interviewed 752 tenants, 418 of which reside in Waterloo, of this 55% of the respondents are 55 years or older. (112) While not representational of the tenant's attitudes within Matavai it does paint broader attitudes within the estate that could be emblematic of the attitudes held within Matavai.

The following statistics are relevant to the community:

• 73% of residents are satisfied with the condition of their homes
• Older respondents (55+) are more positive about the area, evidenced by their intentions to continue living there, with 57% of the 55+ group would choose to stay at the current home in their current neighbourhood.
• 58% agree that there is a sense of belonging
• 58% agree that people are friendly
• 56% feel a sense of community
• 68% agree that there is care and concern amongst neighbours, especially in times of emergency
• High rise residents tend to be happier and more sat-

isfied than low rise residents. This includes satisfaction with:

- The neighbourhood
- The social and community assistance offered
- The local housing office etc

•Anti-social behaviour and safety are seen to be major concerns in the area; particularly drug-related problems, alcohol-related problems, and crime levels in general. Most residents however believe that authorities are working on improving the level of safety in the area

•When asked about what they disliked about their local area, concerns about anti-social behaviour were most often mentioned, particularly:

- Drug-related problems (29% overall)
- Alcohol-related problems (21%)
- Crime levels in general (21%)

• 71% are satisfied with the social and community assistance provided

The statistics show that there is an established functioning community within the area with a desire for the elderly tenants to remain in their current house within Waterloo and Redfern. There is a strong connection with place and dwelling amongst the residents. If we consider the responses representational of the community within Matavai, they weigh in favour of a refurbishment scheme for the tower due to the schemes ability to maintain the sense of place, community, location and dwelling for the residents that a demolition/refurbishment would disrupt. The demolition of Matavai tower and possible temporary or voluntarily permanent re-location of tenants away from Waterloo could impact the community through loss of neighborly relations or decreased proximity to social bonds. Even if tenants would be re-located to new housing within the estate grounds, there are possible complications due to the mobility of some elderly residents, impacting their ability to maintain connections formed in the tower.

There have been steps planned by the NSW Government to ensure that the wider Waterloo community is maintained. These include a staged planning for the site over 15-20 years decreasing the necessity for large amount of movement off-site for residents. It is also planned that a FACS Housing Relocation Officer will work with each household to find a home that meets their needs, including locational needs. This combined with the planned same about of social housing within the Waterloo area could provide a solid foundation for the retention and maintenance of the wider community.

While these steps are important to mitigate community disturbance, the option to demolish/rebuild would still be more disruptive than a refurbishment of Matavai tower.

Of those surveyed for this report 63% said they liked living in Matavai with the remaining 36% saying they very much liked living there. There were no respondents which said that they did not enjoy living in the tower.

Heritage:

Both Matavai and Tauranga tower are Brutalist structures that are excellent representations of modernist design and are local icons of the movement's egalitarian philosophy. The buildings have been included in Glenn Harper's 2016 Byera Hadley report as an example of the Brutalist style. The building embodies the many of the characteristics of Brutalist design such as:

- Unpainted and textured material
- An external appearance made up of bold shapes and massive architectural forms
- Windows as deep slots set well behind the structural frame integrated with sun shading devices and/ or as openings within a highly modelled precast concrete panel. (113)

The design of the buildings was also a key topic of discussion in the 2016 public symposium ''Ugly Heritage: Is Sydney's Brutal Architecture Worth Keeping''. The structures represent an important point in Sydney's modernist architectural history and have become a land mark of the value of architecture and its role in the provision for the vulnerable. The towers provide iconography for the egalitarian ethos of modernism, and their image has become a symbol of the area amongst the community.

The public perception of the heritage value of the towers may have been degraded by the negative media attention surrounding the area. With multiple outlets demonising Waterloo and Redfern social housing, the towers are often featured as representations of reports of crime and danger. With some media outlets branding the buildings ''Suicide Towers'' and ''Towers of Shame'' the importance of their heritage value may have been tarnished amongst the public.

Mental and Physical Stresses:

Due to the age of tenants living at Matavai, the residents mental and physical well-being are more susceptible to the health issues surrounding housing renewal and relocation. Evidence has shown that elderly people are at a higher risk of stress and anxiety about demolition and rebuild projects. As well as impacting mental health, these stresses can influence the physical health of the elderly. A refurbishment scheme would reduce the risk of stress and associated health issues with re-location for demolition.

The NSW government has put in steps to reduce the health impacts the demolition of Matavai may have on the elderly, by delegating a FACS Housing Relocation Officer to each household. This personalised information source could reduce the anxiety about the move by giving residents a feeling of control over their involuntary re-location.

When considering the health of the residents at Matavai, an overwhelming amount of evidence points to a refurbishment as a stronger option due to a demolition/ rebuild having an adverse effect on the elderly, . While steps have been put in place by the NSW Government to mitigate some of the physical and mental health issues, a refurbishment would avoid the feelings of stress and anxiety around re-location. Avoiding the negative mental health impacts would also prevent the associated physical ailments that arise from stress.

Urban:

The need to resist the gentrification of the city is important to maintain a diverse urban fabric. As of 2006 Waterloo was one of only two remaining "disadvantaged suburbs" located within the inner city of Sydney. (114)
The movement of people from Waterloo off site for redevelopment with the ''right to return'' once the devel-

opment has been finished could lead to the dispersal of portions of the community that re-settle in other areas. As seen in examples overseas the ''right to return'' does not always guarantee community retention due to involuntary displacement and voluntary re-settlement. If re-located to areas of low income on the fringes of the city, residents of Waterloo could be subjected to loss of access to employment opportunities, vital services and transport.

While there is a risk of residents being subjected to spatial in-equality steps have been put in place by the NSW Government to try to ensure that tenants are given re-location preferences. It will be vital for the NSW Government to rebuild the same amount of social housing within the area to dampen the effect of gentrification in the area.

There are no indications of the number of people that will be required to be moved off site for the redevelopment of Waterloo, nor where their temporary location will be. As such the spatial implication on a city scale are difficult to define. What can be determined is the resident's current access to resources and attitudes towards their location.

Waterloo has excellent access to social services and transport due to its proximity to the city. In the 2011 community survey, residents perceived accessibility and convenience as the most positive aspects of the area. This includes 40% listing proximity to the city, 30% access to transport and 25% access to shops. 82% of people said they found it easy to get around to places of interest, and 93% agreeing the local area is well serviced with public transport. As for connection to resources 71% are satisfied with the social and community assistance provided within the area. (115)

When looking specifically at the residents of Matavai tower, a temporary re-location could be very difficult on residents due to the elderly's increased necessity for medical services and public transport.

The refurbishment of Matavai tower would mitigate long temporary re-location times. As refurbishment schemes often aim to add value for the existing community, the possibility of voluntary re-settlement could be lessened. The result of a refurbishment scheme could reduce the risk residents being subjected to spatial inequality and decreased access to resources within the city.

Conclusion:

When coming to a conclusion about the benefits and costs of refurbishing or demolition Matavai tower there are multiple factors to consider. There is a disparity when evaluating these projects as the financial and asset value of the two schemes, while intricate, is readily quantifiable, where as other factors related to renewal planning are qualitative. The impact refurbishment or demolition can have on the community, physical and mental health of residents, spatial dynamics of the city and historical legacy cannot readily be ascribed numerical value. As such these impacts are less tangible and harder to represent.

While difficult to quantify there is a strong body of evidence to suggest that Matavai Tower is in a good position for refurbishment over demolition. The structural

integrity of the tower plays a large part in the viability of the refurbishment scheme. A strong building structure removes the need for extensive and costly repairs prior to starting refurbishment and can also permit lateral and vertical expansion. The highly practical layout is an asset, being sensitive to the lifestyle of older residents. The building is well designed, and any design flaws do not severely impact the functionality of the form.

When considering the evidence, the most valid argument for the demolition of the tower would be financial, on the grounds of high on-going maintenance costs, and possibility to increase the number of apartments on the site for private sale. Outside of the financial ramifications, a refurbishment scheme would mitigate many of the social, urban and health problems associated with demolition and re-housing. The established happiness and desire for tenants to stay within their current housing provides a strong foundation to refurbish. The age of the tenants must also be taken into consideration as it has been shown level of stress and anxiety can increase in the elderly when re-housed, possibly impacting their physical health. A refurbishment scheme would allow the current community to continue to function and not impact social bonds formed in the tower. The scheme would also diminish any risk of tenants being subjected to the difficulties associated with economic spatial segregation when temporarily relocated. In conjunction with social benefits, the scheme would continue the legacy of the modernist housing and the ethos of egalitarian architecture. The demolition of the tower would be a demolition of a portion of Sydney's architectural and social history.

Waterloo Case Study: Matavai Tower

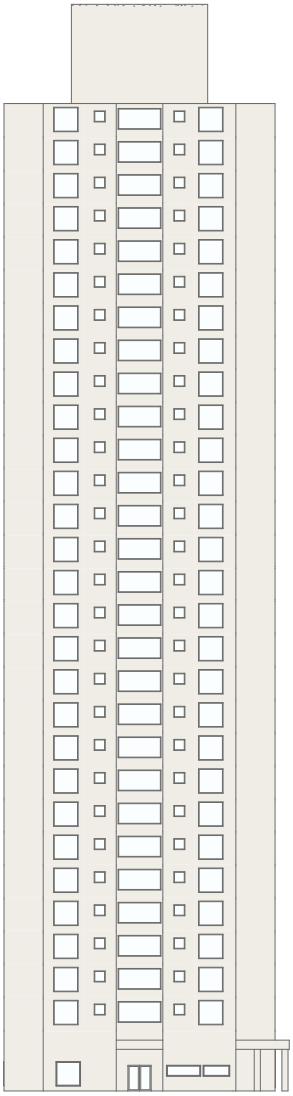
Location: Waterloo, Australia

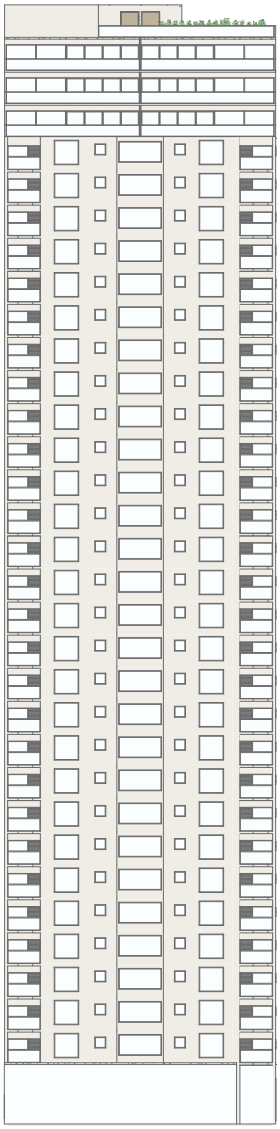
Year built: 1976

Demolition Planned: Roughly 2028

Stories: 30 + 3

Matavai Tower is an social housing icon in Sydney. Its refurbishment and preservation would benefit the existing community and retain an important part of Sydney's architectural history. The following design exercise is and example of the many possibilities for retaining and improving the form. The design aims to strengthen and build on the original to provide amenity to the current residents.





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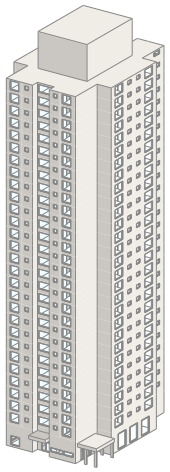

Original building

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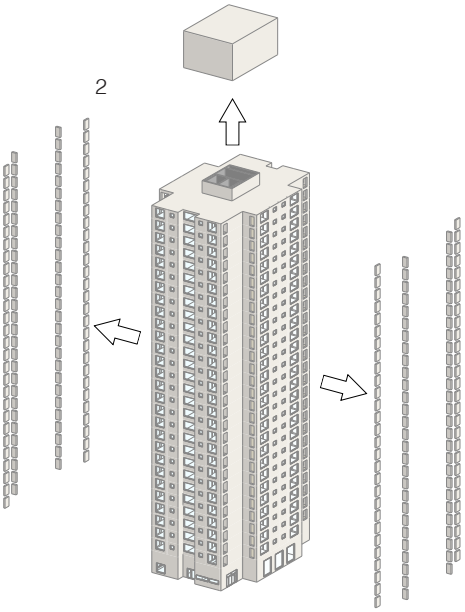
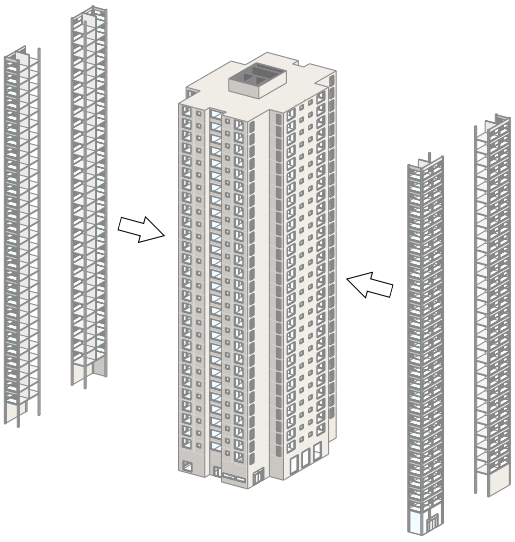


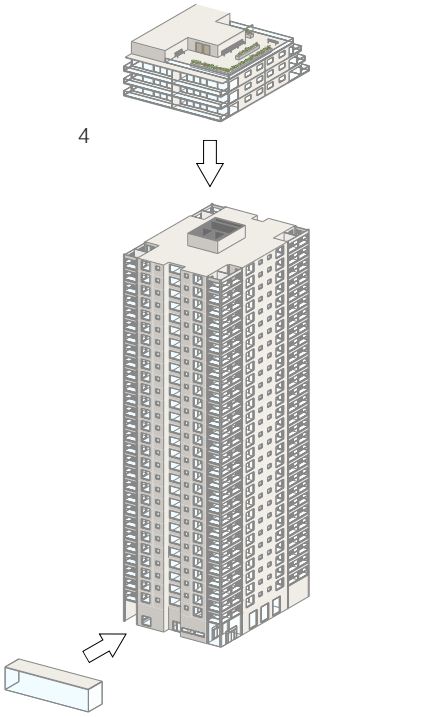
Remove plant room and portions of facade

3



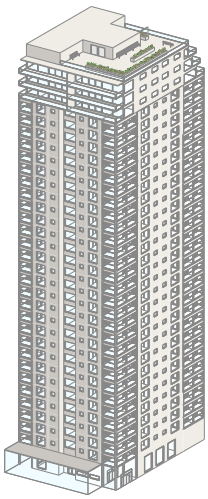
Add extensions

4

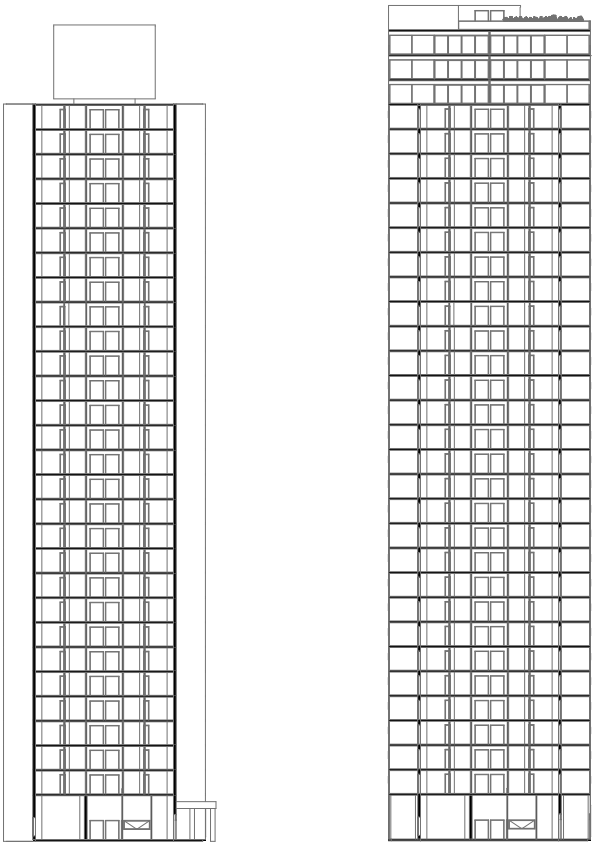


Add top hat additions and winter garden

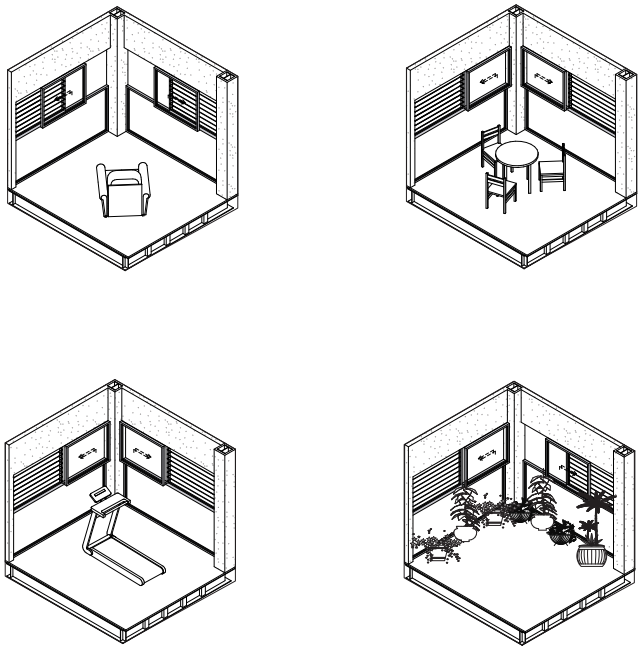
5



Refurbished!



Building section before and after refurbishment



Non-programattic Extension Spaces

At an initial design stage, a survey was undertaken of 22 residents who live at Matavai tower. The survey aimed to understand the strengths and weaknesses of the building and how the form could be improved for the current residents. The results of the survey concluded that Matavai residents were happy with their current living standards and enjoyed living in the building. The residents were asked whether they would enjoy more private or communal space, 86% of residents preferred the option of an extension of their private dwelling. When asked the reasons for wanting more private space 13% responded with the need for more storage, 5% responded with a desire for an uncovered-out door area, and 82% responded with a desire for an extra room in their apartment.

There are multiple scales and programs the design tries to address, with the key goal to provide amenity for the current residents of Matavai. When analysing the structure, the silhouette of the floor plate opens itself to extension by providing large voids at the corners of the tower. Filling these voids and expanding the geometry of the floor plate was deemed to provide the strongest option for the improvement of resident's apartments. The current studio dwellings provide little to no opportunity for personal storage or flexibility in the programmatic understanding of the apartments. As a response to the small size and defined program, the new extensions are non-programmatic living spaces for residents to define and personalise. The personalisation of the space aims to give the user a sense of ownership of their apartment and to provide flexibility to the needs of current and future residents.

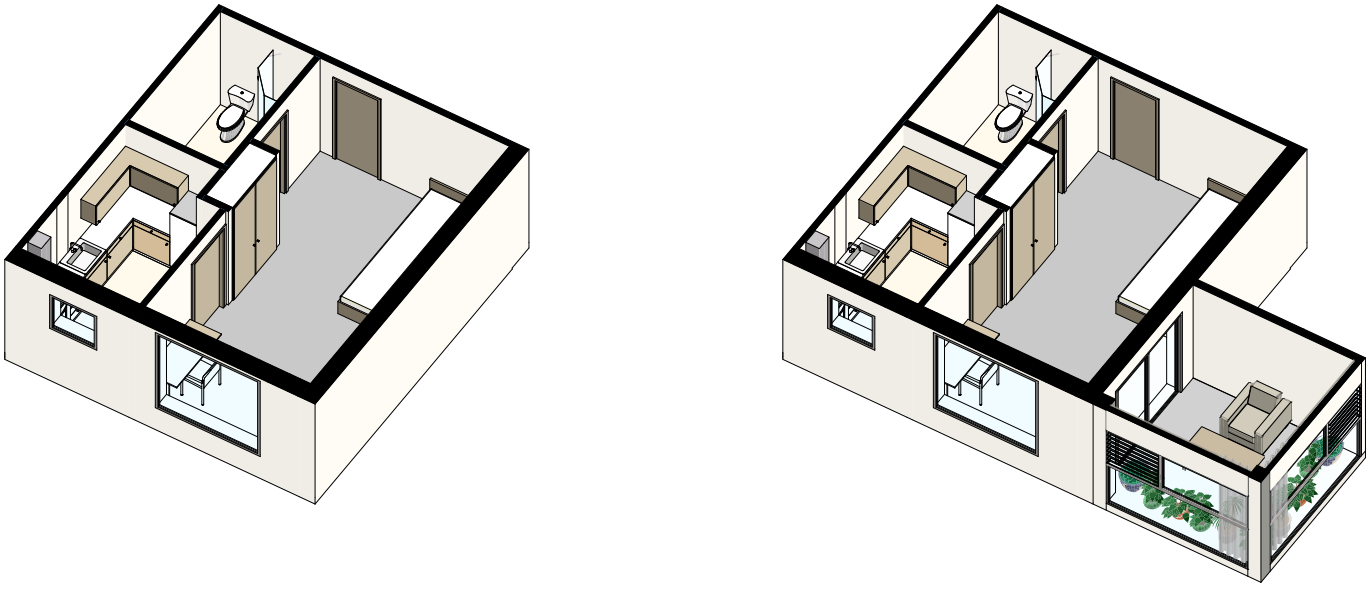
Currently the studio apartments measure roughly 30m2, which is under the SEPP 65 Apartment Design Guide criteria of 35m2 of internal space for new studio apartments. The 9m2 extensions would bring the usable space of the apartment above the recommended living space.

Due to the height of the tower balconies were deemed inappropriate, as such were enclosed to prevent the space becoming unusable due to wind. The enclosure also strengthens the idea of flexible space, creating connection to the outside while remaining private.

The structure of the extensions is self-supporting, due to the lack of knowledge of the location of load bearing walls. As such the complete removal of the façade and extension of floor slabs was deemed unsuitable. The extensions will be constructed from a steel frame to support the extended platforms. The structure will be fixed to the existing façade of the tower to add lateral stability.

The iconography and heritage of the structure was considered with the material palette of the new additions. The simple strong material palette of pebblecrete, aluminium and glass was applied to the new balconies and apartments, helping them blend into the original form.

The extension of the dwellings aims to increase the passive heating and cooling of the apartments and increase the energy efficiency of the building. The materiality of the extensions would harness the winter sun and allow the transfer of heat to other spaces in the apartment. The



Apartment axonometric before and after refurbishment

transparent glass means the retention of heat within the space, creating a warm environment for the user. During the summer months, internal shading devices will be used to block most of the summer sun and associated heat. Including these shading device, operable windows allow users to increase the ventilation of their apartment. The aim is to harness the downdraught effect created by the height of the towers to increase the air change rate in the apartments. The addition of a double-glazed door accessing the external space means the user will have control over the amount of influence the extension has on the temperature of the original apartment.

When considering the choice between demolition or refurbishment, the financial viability of the scheme was deemed to be the least feasible aspect of the refurbishment. As a response to this the building has been top hatted with 3 new floors of luxury apartments. The private sale of these apartments aims to subsidise the works on the other portions of the structure. It is proposed that twelve new dwellings will be built on the top of Matavai and have been split into ten 2-bedroom apartments and two one-bedroom apartments. The structural viability of top hatting Matavai has been confirmed in private consultations with engineers familiar with the building.

Initially the design scheme included green walls and plantings on the edge of the balcony to improve sun shading and cooling effects however this was deemed to be not financially viable due to extensive irrigation and systems upgrades required.

The design of the new apartments capitalises on the

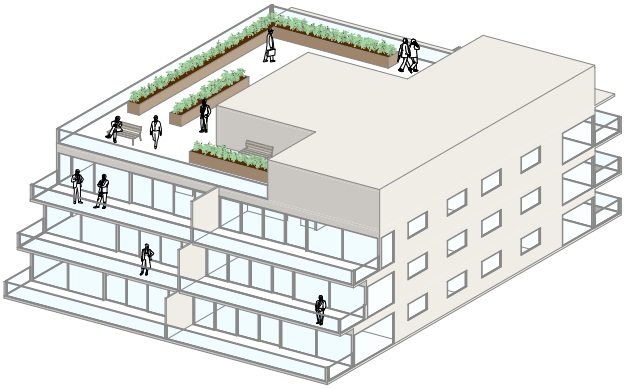
An initial design scheme that included green walls
Image done by visualisation firm The Chamber

unobstructed view of Sydney city. The south facing apartments have a wedding cake style stepped façade to maximise the amount of afternoon sun reaching the apartments. The orientation of the new apartments aims to prevent cross viewing into the adjacent tower and mitigate the impact of the prevailing westerly winds.

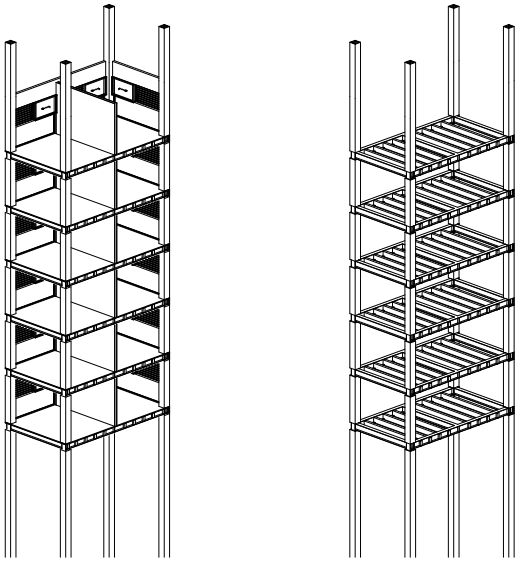
The structure on the top of the building serves as a plant room which houses two water tanks, approximately 3m x 3m x 2.4m, as well as the lift over run and other services for the building. These structures and services will be relocated to the new plant room at the top of the building.

The addition of the new floors would not add any height to the existing building due to its proximity to Sydney airport. Currently the structure stands at 97 metres tall. This exceeds 80-90 metre limit dictated by the ''Sydney Airport Obstacle Limitation Surfaces'' set by the Commonwealth Department of Infrastructure and Regional development in 2015. The vertical extension of the building, while structurally feasible, would most probably be disallowed due to interference with air traffic.

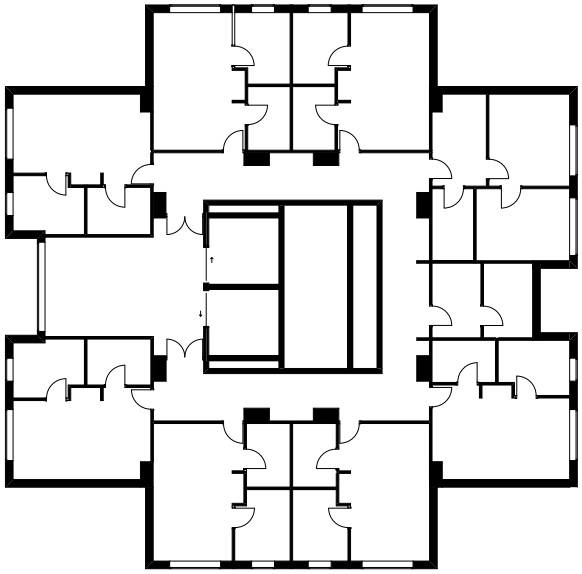
To provide amenity to all residents of the building, a roof garden has been placed a top of the tower. The idea is to create an equal communal space to integrate the private and public housing. The common rooftop garden aims to dispel the hierarchical image created by topping a social housing tower with luxury apartments. Social housing provides a powerful visual statement about the provision for the most vulnerable in our society. While the private sale of apartments aims to achieve a more realistic financial outcome, it is important not to corrupt the modernist philosophy of equality which drove the initial design of the building.



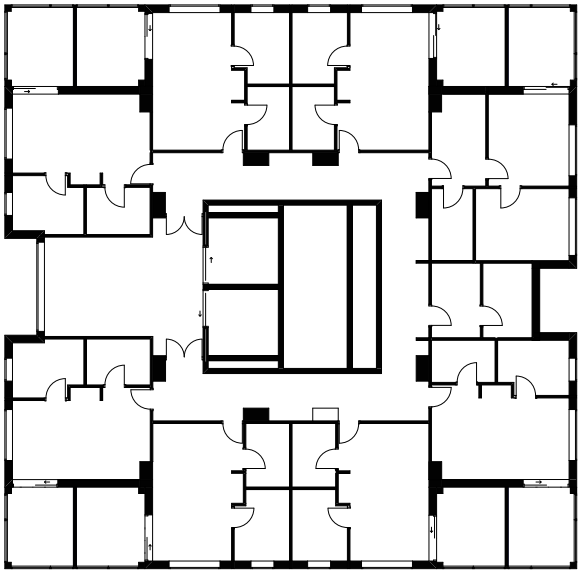
Top Hat Axonometric



Apartment Extension Structure



Original Plan



Refurbished Plan

5

Conclusions and moving forward

The refurbishment of modernist social housing buildings is a new development in the effort to house an increasing population in rapidly densifying cities. The case for refurbishment of post-war social housing structures is varied and complicated. Due to this complexity there is no clear definition in the viability of demolition or refurbishment and each instance must be assessed on an individual basis.

The assessment of renewal options for social housing often results in conflicts between ideologies. The decision whether to demolish or refurbish ultimately lies with the owner, which in most cases is the municipality. Due to the intangible nature of empirical impacts such as community, urban and health implications, the assessment for the viability of a refurbishment may be skewed. Budgetary stress could prioritise short term financial windfall through the introduction of mixed tenancy, and prove a large factor in the decision to demolish instead of refurbish social housing. Trending evidence suggests refurbishment schemes, in the long term, are more financially viable, environmentally sustainable, have lower community impacts, less urban segregation, lower health impacts, and result in the retention of heritage significant forms. However, this evidence is not enough to suggest the total refurbishment of all modernist social housing. It does raise strong cues that refurbishment should be thoroughly considered over demolition. The lack of refurbished social housing buildings suggest that there is not enough emphasis being placed on how these forms can be retained and renewed.

The case studies presented establish a precedent for the ability to deal with design flaws of modernism. Each case study represents a specific set of contextual influences that have resulted in architectural intervention and retention. The ability for seemingly rigid architecture to be fluid and malleable presents endless opportunity for how we conceptualise and deal with aging forms. When considering modernist housing structures which, through time, have developed communities, habitats and memories, the improvement of standards for the existing residents allows the continuation of egalitarian ideals through built form. Many of the case studies work off modernist ideals as a foundation for the improvement of the buildings. The ability for architects to reflect on the design and reorientate structures to better fit purpose is unique when applying modernist ideologies. The strong position of most architects interviewed was that modernism had not failed, rather had not achieved the high standards it has set itself. The architects spoke of the ideals of modernism as noble and important, and saw their own works as a continuation of the legacy of movement. With profit driven planning and development dominating the architectural profession, the revival of ideological positions based on community and equality allows for the recalibration of the possibilities of built form.

The opportunity to re-examine post war structures has wider implications for the application of architectural renewal. Built form represents not only embodied energy, but community, memories and homes. The demolition and rebuilding of form once they are deemed unfashionable is not a sustainable practice. While this research has been specifically about the importance of social housing retention, the lessons learnt have wider applications for the retention and reuse of architecture outside of modernist social housing.

When looking at the context of NSW and Sydney there is a huge demand for social housing. With the quality of NSW social housing deemed to be the poorest in Australia, there must be wide spread renewal to provide adequate dwellings for those who need it most. Refurbishment could play a large role in the renewal of social housing. As refurbishment often proves to be more financially viable than demolition, the option could relieve budgetary pressures for the NSW government to build more housing to deal with the extensive wait list.

Waterloo estate is emblematic of the attitudes towards social housing within NSW. The current plan to demolish Waterloo estate could result in the possible fracturing of community, negative impacts on heritage, urban fabric of the city and the health of residents. There is a clear established community within Waterloo and the current plan to demolish and rebuild the estate has placed a large amount of stress on the residents. The NSW government has put in steps to try to retain the community however poor communication has left many residents unsure of their future on the estate. Refurbishment provides a clear opportunity to provide people with updated and improved living situations with the knowledge they will not be required to uproot their lives.

The case for the retention and refurbishment of Matavai and by extension Taranga towers is viable due to a multitude of factors. The strong structural condition of the towers clears the largest hurdle when assessing the viability of a refurbishment scheme. The financial impacts of a refurbishment can be offset with the introduction of private housing on-top of the tower. The tower's considered design for the elderly has meant they continue to function and provide comfort for the residents. The largest factor and argument for the retention of the towers is their tenancy. It has been shown that relocation disproportionately effects the elderly often breaking strong social ties formed, possibility leading to feelings of isolation and ill-health effects. On-top of this the tower is a important example of the brutalist movement within Sydney and one of the few remaining examples of brutalist social housing architecture.

While many still see the structures as aging relics of the past, to be torn down for something deemed more visually palatable, their revitalisation has deep symbolism in the narrative of social housing within Sydney. The towers are a strong visual reminder of ideology driven architecture, based on equality and community rather than profit. The retention of the towers to benefit the existing community continues the legacy of modernism and re-established architecture as a means of provision for everybody, not just for those who can afford it.

In the words of resident Catherine Skipper ''As a robust visual statement of socio-political commitment to housing the vulnerable, the towers represent an honest, egalitarian vision. In choice of material and in choice of structure they are what they are: and for what they are, if we want the future to think well of us, we will fight for their right to stand where they do.'' (116)

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Acknowledgements

I would like to thank the NSW Architecture Registration Board for giving me the opportunity to travel and see the impact social housing refurbishments can have as well as interview the architect's responsible. Without their on-going support this research would not have been possible.

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About the author Alexander Jones

I am currently completing my Masters in Architecture at Lund University, Sweden. Upon completing my bachelor of Design in Architecture at University of Technology Sydney I became interested in the impacts of architecture outside of architectural rhetoric. I spent 2 years at SUPERCONTEXT Sydney under Andrew Daly who has played a large roll in my understanding of the tangible impacts architecture can have.

I believe quality housing is a fundamental right and architects should be working towards providing equatable and fair housing solutions for everybody. I am interested in architectures ability to lay the foundation for a more equal society.

This report has been influential in my intentions to produce justifiable architectural forms that have a positive impact for communities.

Further in my career I anticipate this paper being decisive in how i perceive current built form and its capabilities to be reused, upgraded and re-cycled.

8

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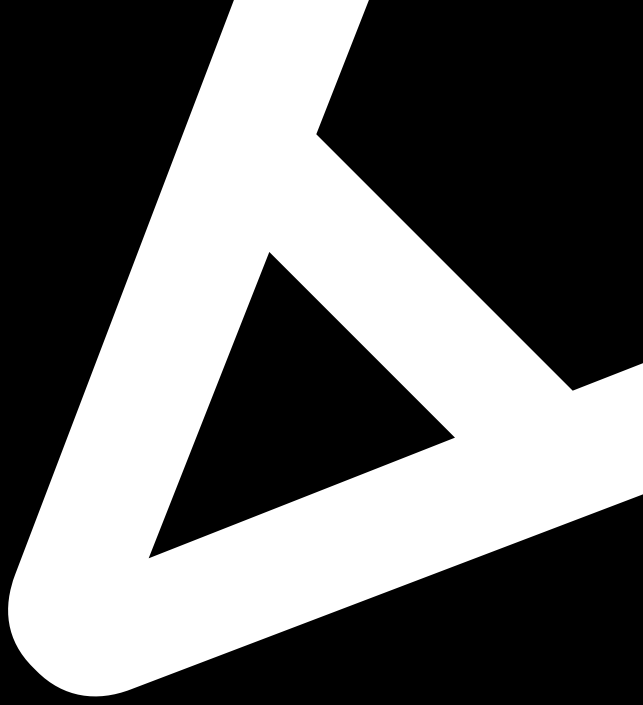

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