

Figure 1: Exterior view of Whitchurch Hospital (Cardiff and Vale UHB. 2019)

# WHITCHURCH HOSPITAL

A proposal for a sustainable future, through multigenerational living

A community for everyone

Ceris
Fussell
ART504
Case
Studies and
Regional
work

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#### Introduction

Completed in 1908 Whitchurch hospital was heralded as one of the UK's most advanced facilities of its time in mental health treatment and hospital design. Powered by new technological advancements it was lit by electrical lighting, radiators and ventilated well. After its closure in 2016 the Grade II listed building has since remained in a period of neglect, its decaying structure is of the last remaining examples of the collaboration between two prominent hospital architects of the period George Oatley and Willie Skinner (Gnoińska & Hughes, 2020, p7). There are many tangible and intangible features that comprise its significance; its design of its pavilion wards, and its symbol of Cardiff's growing ambitions to develop an innovative hospital for the care of mental illnesses, and also the strong communal value developed at the hospital (Gnoińska & Hughes, 2020, p36). Mental care institutions often carry very negative feelings linked to its facilities, for many who worked and lived in Whitchurch, they saw the hospital as an innovative facility, part of the community and a safe environment with caring staff. A book published after the hospitals closure 'Behind Many Doors' demonstrates this through its interviews with past staff and patients with one individual stating that the hospital was a place where "...people can find security to express themselves..." (Carradie & Goffin, 2014, p103).

The hospital was built to tackle the issues primarily that of caring of severely ill and mentally ill patients in its locality and further. To implement contingencies for its future, it may be worth assessing what issues are the focus of today and that affects our mental health in different ways such as; money concerns, housing issues and loneliness. Its locality and size host a variety of possibilities, the resources it holds in its built state would also be shame to waste. Housing and Local Government Minister Julie James from the Welsh Government recently announced a £30million budget to deliver more affordable housing and to "...develop homes with low fuel bills to tackle fuel poverty, homes designed and built with a low carbon impact in mind" (Welsh Government. 2019). Research by US National Trust for Historic Preservation in 2016 discovered that reusing an existing building and upgrading it to be as efficient as possible is almost always the best choice regardless of building type and climate with new builds taking 10 and 80 years to offset their carbon cycles (Adam, 2019). Therefore reusing an existing building and upgrading it to be as efficient as possible is more environmentally conscious than demolishing and rebuilding. The objective of this essay is to put forward a proposal for the sustainable future of Whitchurch, utilizing this asset to help solve local socio-economic and environmental issues.

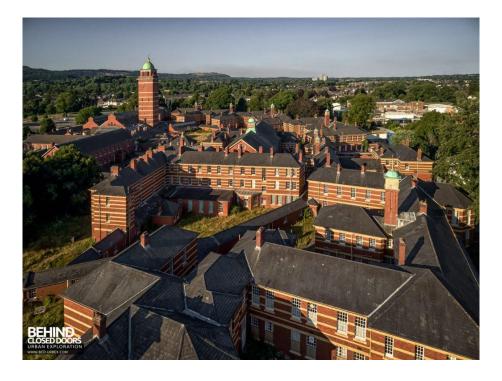


Figure 2: Eagle eye view of Whitchurch Hospital (Behind Closed Doors, 2016)

#### Social issues to be addressed:

#### **Housing Crisis**

The UK is currently experiencing a 'housing crisis', the term which has appeared on many news headlines over recent years and a complex issue created by numerous factors such as; an increase in overall population, a gap in earnings to house prices, and a lack affordable housing being built on a large scale. Shelter Cymru reports that around 60,500 households are on social housing waiting lists in Wales, with over 15,000 people becoming homeless every year and rent levels rocketing, home ownership is increasingly an impossible dream for many (Shelter Cymru. 2020). The knock on effects of this crisis have resulted in a 'generation rent' with 40% of 25-34 year-olds not being able to afford to own property in their area (Hughes. 2018). Increases in house prices over the last decade have excluded many 'first-time buyers' from the owner occupied market and despite price falls and record low interest rates since the recession, affordability remains a difficulty for many existing and new forming households. According to a report released by the Welsh Assembly Government in 2011 around 14,000 new homes were required to be built every year in Wales for the next 15 years to recover from the effects of the housing crisis (Baxter, J et al. 2011, p72). In Cardiff alone there is a high demand for rented accommodation and social housing with a limited number of properties

becoming available to let each year. There are currently around 8,000 people on Cardiff Councils 'Common Waiting List' for social housing (Cardiff Housing. 2020). Under-occupation is also an issue with an estimated 2,000 three to four bedroom family units under-occupied in Cardiff. (City of Cardiff, 2015, 150). With a projected increase in the older population in years to come, creating a strategy now to tackle under-occupied family sized units may help alleviate the pressures in the near future.

#### Loneliness

Issues that may stem from under-occupied houses, particularly with older generations is loneliness. The feeling of loneliness isn't in itself a mental health problem, but there is evidence that the two are strongly linked. According to the mental health charity Mind, research suggests that loneliness is associated with an increased risk of certain mental health problems, including depression, anxiety, low self-esteem, sleep problems and increased stress (Mind, 2020). Older people are more vulnerable to loneliness and social isolation, especially if the feelings of loneliness have lasted a long time. According to Age UK, more than 2 million people in England over the age of 75 live alone, and more than a million older people say they go for over a month without speaking to a friend, neighbour or family member (NHS, 2018). This issue also affects younger generations with research by the Office of National Statistics finding that almost 10% of people aged 16-24 were 'always or often' lonely three times higher than people aged 65 and over (Coughlan, 2018).

# **Area Analysis**

# Locality of Whitchurch

By looking at data accumulated by the office of national statistics from the census conducted on the 27<sup>th</sup> March 2011, we are able to gather broader picture of the demographic of suburbs of Cardiff. The distribution of households living in poverty defined as the percentage of households whose income is below 60% of the annual median income as shown in figure 3 (Cardiff Partnership, 2015). The map highlights the distribution of wealth and poverty that can be found in parts of the city that are generally considered to be more affluent. The information that we can see in figure 3 shows that the area has a mixture of mid to low incomes. Looking further into the economic activity of the area in figure 4, over half of the population is either in full time, part time or self-employment. It appears that around 12% of the population, in 2011, are retired with a larger portion of 22% being economic inactive (which means that they also may also be retiring, but could also include students or those too ill to work).

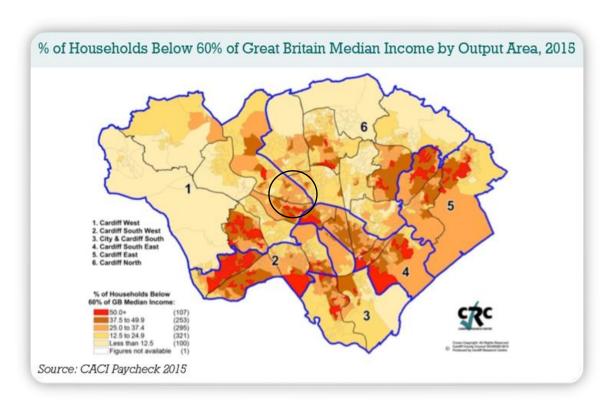


Figure 3: Distribution of wealth map in Cardiff (Cardiff Partnership. 2015)

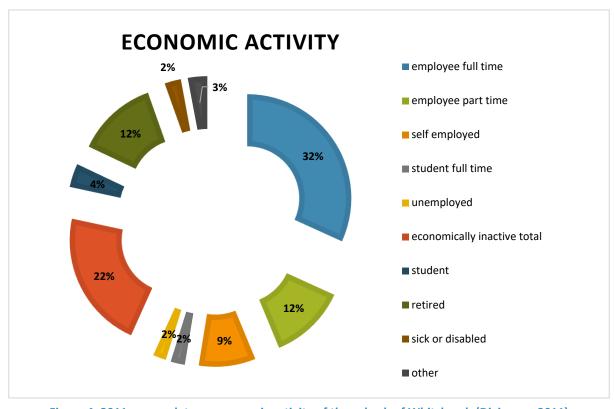


Figure 4: 2011 census data on economic activity of the suburb of Whitchurch (Digimaps, 2011)

Property ownership in figure 5 shows that the suburb is heavily weighted to those that have bought them outright, or are otherwise paying mortgages, with a smaller portion renting from either private landlords, the council or socially. Figure 6 shows that there appears to be a large portion, equating to 28% of the overall households to be only occupied by one person. Data was unable to gathered in confirming whether these households contained more than 2-4 bedrooms. The overall image we can gather from this area is one that is a family orientated, with a high level of home ownership consisting of families and the retired. Figure 7 also clarifies this image, showing that the majority of the population is over the age of 35. The next census scheduled is March 2021, it may be that some changes may have occurred over the past 10 years. Although Whitchurch is an area that may be susceptible to the issues created by an aging population and under-occupied family sized households.

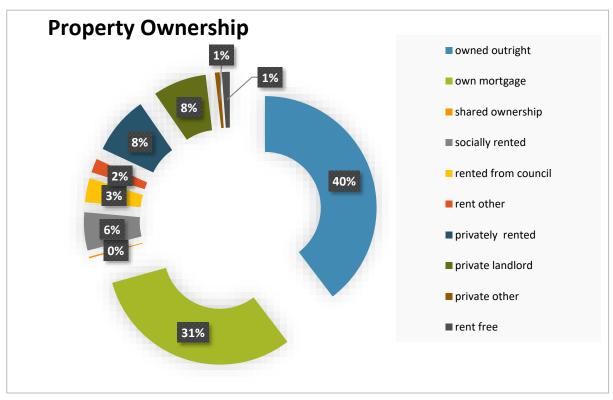


Figure 5: 2011 census data on property ownership of the suburb of Whitchurch (Digimaps, 2011)

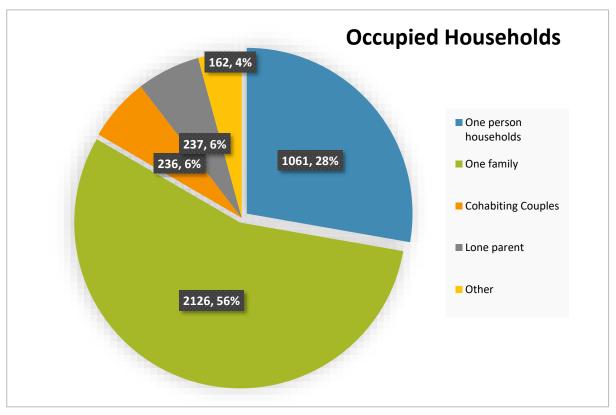


Figure 6: 2011 census data on occupied households of the suburb of Whitchurch (Digimaps, 2011)

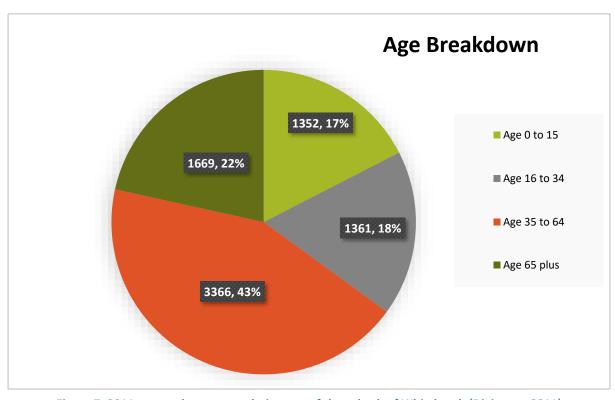


Figure 7: 2011 census data on population age of the suburb of Whitchurch (Digimaps, 2011)

# **Case Studies**

#### Multigenerational Living

There has been a growing interest in the concept multigenerational living: it's definition meaning a household that holds two or more generations of related adults together, it can also be referred to as intergenerational living (Aviva, 2012). It is not a relatively new concept around the world, stemming from our earliest form of habitation it has since been on the decline in western countries since the post-war era. Multigenerational living has been identified as many forms; one is where three generations of the same family live together, with grandparents living with younger generations (e.g. their children and grandchildren) (Burgess et al, 2019, p6). The second main type is two adult generations of the same family living together. Within this type are two sub-groups. One is households with parents living with their older, adult, non-dependent children (e.g. younger adult children returning to the family home after studying, or older adult children returning to the parental home after divorce).

In Asia, multigenerational living is usually quite common with some families apparently having an obligation to serve, honour and obey their parents (Ikels 2004). In the UK it is primarily utilised for the families with children over 25 to save money to purchase their own property (Clapham et al. 2014), of which is linked to housing market pressures, worsening affordability, rising living costs and the difficulty for young people of entering home ownership (Druta and Ronald 2017). Around 1.8 million households now span two or more adult generations in the UK the factors driving this increase includes; providing support for older family members, a lack of retirement homes, help with childcare and increasing housing costs. Increasing house prices and worsening affordability, is likely to worsen with the added issue of an ageing population forecast to rise to 18.5 million by 2040 (CBRE, 2020). The data from the national census as visible in figures 4, 5, 6 and 7 suggests that Whitchurch would likely be affected by this issue with a large proportion of one-person households already and a large retired population. There is an estimated demand for 125,000 multigenerational homes per year in the UK, currently 7% of UK households cater for 2 or more adult generations (Scottish Construction, 2017).

Benefits can be found in this concept of habitation, in Kent the county council teamed up with Thanet district council to purchase a rundown former hotel for £150,000 as part of a regeneration scheme. Around £1 million was spent on converting the property into a home. Situated over 5 floors the property has 3 kitchens, 5 bathrooms and 7 bedrooms and the families within privately rent the property from Kent county council (Melley, 2019). The house was also designed to meet high environmental standards with water from the washing machine being recycled for use in the toilet,

which means a household of six people uses the equivalent of a two-person household. It also led to the retention of historic building stock that would otherwise be unused or demolished.

Negative ideas tend to formulate surrounding the idea of older 'boomerangers' (older adults who returned to their parental home), viewed by some as 'parasitic', research into challenging this preconception, suggested that this model of living enables residential occupiers to regroup their economic assets (Maye-Banbury & McNally, 2019, p1). Enabling family members to consolidate resources in times of need over space, place and time, potentially protecting present and future generations from resorting to 'asset stripping decumulation' such as high private rents (Maye-Banbury & McNally, 2019, p15).

Drawbacks of this multigenerational concept is that residents can feel cramped and overcrowded in smaller houses, and many people would understand the frustration and lack of independence sometimes of living back with our parents. Research shows that multigenerational households tend not to be large with one quarter of households with grandparents present containing three people, just over 20% contain four people and a similar proportion contain five people (Burgess & Muir, 2019, p10). Research in the USA of households of children born to single mothers, assessed whether co-habiting with a grandparent is associated with preschool aged children's school readiness. In one of the models studied, co-residency in those who were least likely to co-resident around the time of birth; were associated with higher literacy scores and, to a lesser extent, greater cognitive skills, but fewer prosocial behaviours (Augustine & Raley, 2013, 451). The researchers conclude that this may be a result of the selection of models, revealing that those with a higher likelihood of multigenerational co-habiting, generally come from poorer backgrounds with fewer resources (Augustine & Raley, 2013, 451).

Research on multigenerational living in Australia concluded that an important issue arising from the study was the unsuitability of the design of much of the existing housing stock for multigenerational living and the need for greater innovation in the design of suitable dwellings (Burgess & Muir, 2019, p14). The research showed that despite the acknowledged challenges of living together as a family, such as lack of privacy or imbalances in amount of house work done by individual members, there were feelings of intergenerational solidarity and companionship.

In another study, using the 2014 General Social Survey-National Death Index, a prospective multiyear survey. They explored whether single generational living arrangements were associated with a higher risk of mortality than multi-generational living arrangements. It was found that healthy subjects that lived in two-generation households were found to have lower premature mortality

(Muenning et al, 2014). Indicating that healthy people living in two-generation households have a longer survival than healthy people living on their own.

Private developers such as Redrow, Bellway and Taylor Wimpey have been addressing the growing trend of multigenerational living by building homes that allow parents and their adult children to live under one roof while also enjoying the space and privacy they need. For example, the five-bedroom Hampstead at Tove Grange in Towcester has two bedrooms on the top floor — otherwise known as 'rooms in the roof' as visible in figure 9 with a shower room between them. Creating a space for two older children or for one young adult to have their own bedroom, a separate living area and a bathroom, all conveniently tucked away from the rest of the household (Burgess et al, 2019, 23). This example shows that private developers are finding a marketable audience within this concept. Allowing a scope for funding that there would be a demand for such units once completed and marketed appropriately.

Multi-generational living does produce benefits for most family units, although on the other hand it does also produce negatives where overcrowding and poverty are concerned. To alleviate these negatives it might be beneficial to look into a combination of inter-generational living community. Allowing families to have freedoms and privacy and areas for relaxation.



Figure 8: Exterior view of a Redrow house catered for extended family (Burgess et al, 2019, p24)



Figure 9: House type by Redrow Floor plans (Burgess et al, 2019, p24)

#### Intergenerational co-housing community examples

Cohousing communities are comprised of a cluster of private homes alongside communal facilities a popular concept in countries like Denmark, Holland and the USA. The housing is typically intentionally designed – either from the ground up or by taking over unused buildings – to foster a sense of community. The initial residents in the group often contribute significantly to this design and upkeep (Wales Co-operative Centre, 2019, p16).

A co-housing project in Swansea in the Mount Pleasant area is part of the movement of community led housing schemes in Wales, a co-founder and resident of the community said that "multigenerational cohousing can assist young families to get on the property ladder and regenerating our local buildings can build practical, much needed skills in our local young people." (Wales Co-op, 2020). Feedback from recent projects reveal that even though there are negatives, working with view and ideas of people, overall feedback has been very positive with an increase in peoples wellbeing, feeling less isolated and better security financially and in quality of life (Wales Co-operative Centre, 2019, p4).



Figure 3: Community members of Marmalade Lane, Cambridge (Marmalade Lane, 2020)

A recent development in Cambridge, Marmalade Lane, its first co-housing community has received many accolades for its housing design. Marketed as a 'sustainable neighbourhood of 42 state-of-theart homes with community facilities and beautiful shared gardens' properties range from 1-2 bed apartments to 3-4 bed houses with prices beginning from £255,000 (Marmalade Lane, 2020). As well as their own new private home, each resident household benefits from shared spaces and facilities that enrich the living experience and encourage a more social way of life. All residents are

members of Cambridge Cohousing Ltd and have a stake in the common parts and contribute to the management of the community (Marmalade Lane, 2020). The area is situated close to direct access to the city centre and the new Cambridge North railway station via the Cambridge cycle network and the Cambridgeshire Guided Busway, accentuating the ethos of a small environmental footprint.



Figure 11: Marmalade Lane exterior (Marmalade Lane, 2020)

#### Historical Hospital Redevelopments

The Hayes Point development in Sully, South Wales in is example of successful conversion of an historic hospital into luxury flats. Formerly Sully Hospital constructed in 1931-8 for the treatment of tuberculosis patients it was designed in a Modern Movement, Art Deco style and is Grade II listed (Coflein, 2005). Its £25million redevelopment resulted in its refurbishment and extension to provide 245 new luxury apartments and community facilities (DCFW). The development removed some of the derelict and un-safe elements within the site and built new buildings to increase the number of apartments in a sympathetic, contemporary style. Some elements that reveal its past use is its long corridors, a listed feature that provides a route throughout the development. Additionally sustainability improvements to reduce heating requirements were made to the site including thermal improvement, by adding insulation and dry-lining to prevent water penetration in the living accommodation, all existing concrete roofs were repaired and rebuilt with new insulation and weather protection (DCFW).



Figure 12: Exterior south facing view of Hayes Point apartments (DFCW)

Another successful site is that of The Quatermile mixed use development on the site of on the former Royal Infirmary of Edinburgh. A mixed use redevelopment in the heart of a city, completed in the early 2000's the project, a joint venture between Glade dale Group and the Bank of Scotland (Hartley, 2020, 23). The entire site was redeveloped for a range of adaptive re-uses providing a mix of modern housing and office spaces. The overall plan retained the significant of key focal points being the original medical pavilions, surgical hospital while integrating new build alongside them. The Clock Tower is identified as the most significant element to be retained with selective demolition to accommodate public open space with some buildings were deemed structurally beyond repair or commercially unviable (Hartley, 2020, 23). Images of a typical 3 bedroomed flat on Zoopla in figure 13 show that the internal spaces are bright and spacious integrating historical elements into its contemporary styling.

There are many elements that can be drawn from the redevelopment of these sites that could be integrated into the proposal for Whitchurch such as the retention of key design elements and possible removal of those that are not suitable or financially viable. Sully points sustainable aspect would be of benefit to the design of housing units to allow for comfortable inhibition of the units, The Quatermile shows how versatile and lucrative redevelopment can be, with high ceilinged spacious contemporary city styled living.



Figure 13: Inside a 3 bedroomed flat for sale at the Quatermile redevelopment, Edingburgh (Zoopla, 2020)



Figure 14: Exterior view of the redeveloped pavilion wards at the Quatermile, Edingburgh (Zoopla, 2020)

#### Vision proposal

## Multigenerational housing unit and sustainable energy hub

The proposal for the development of Whitchurch hospital will be to integrate a mixture of housing catered towards multi-generational living and co-operative community living, with a sustainable energy hub at its centre. Harnessing the ethos of co-housing communities such as Marmalade Lane, and Mount Pleasant area in Swansea with an 'importance' of a small environmental footprint, the idea would be to convert the pavilion wards into housing units, ranging from 2-4+ bedroom houses and flats. Selective demolition may be required where buildings have suffered damage due to lack of care and possible, and preferably the connecting corridors to allow for ease of access, and to free up its institutional layout to allow access to cars and bicycles. To avoid the strategic forgetting of the past use of the site, its reconfigured design and ethos will continue to offer memories and generate remembrance of its former use. Keeping key design aspects by Oatley and Skinner such as the pavilion wards, recreation hall, water tower and boiler room where the heart of the sustainable energy hub will be placed to provide heating for the residential units and also treatment for grey water. Below Figure 15 is a simplified aerial view of this proposal.



Figure 15: Key of planned proposal of Whitchurch (Coflein, 2016)

- Sustainability hub
- Mixture of housing and flat units

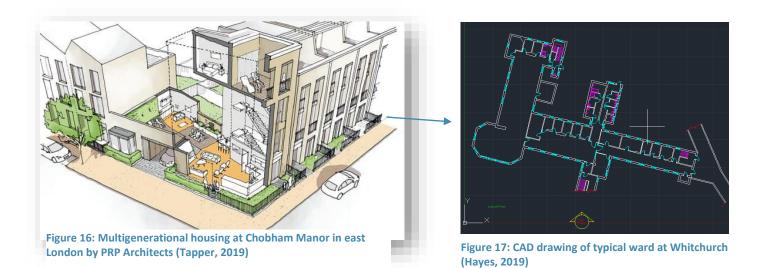


Figure 16 shows a concept drawing for a multigenerational development at Chobham manor , London. Communal areas are based on the ground floor, with quarters for the less able members of the family, rooms becoming more catered towards different ages as the building extends upwards. Figure 17 shows that there is space for these to be separated into housing units creating houses of two to three floors, being able to house upwards of 4 people with wards will being separated into terraced 2-3 floor houses and apartments.



Figure 18: Exterior photo of one of the wards at Whitchurch hospital. (Authors own, 2019)

## Allotments and small farm

Working on the foundations of rehabilitation and the self-sustaining past of Whitchurch, providing facilities such as allotments or small farm amenities echo these foundations providing an outlet to improve residents health, physically and mentally. In figure 19 previous maps of the site, shows that large pockets of land were used for orchards and greenhouses, around 27 acres in total, to provide daily rehabilitating work, food for the patients and community (Loue, 2016, p2). Records show that produce such as pigs and vegetables were farmed and taken to market as a form of generating income (Fussell, 2020, p4). Gardening has been shown to be beneficial to our mental wellbeing, part of the treatment at the hospital of daily duties it helps alleviate stress, and provide a form of outdoor exercise. Research has shown that one single session of allotment gardening can improve both self-esteem and mood, with engagement of both wild and cultivated natural places reducing stress and anxiety (Wood et al, 2015, p336). The opportunity would be beneficial to educate people and also allow the production of fresh food to feed families throughout the year and a place of social contact to combat loneliness. Food waste from houses could also be used to create compost, with additional areas like wildflower meadows a safe haven to attract bio-diversity and wildlife. Additional plots could also be used for small livestock such as sheep or pigs, as therapy animals and additional income they're waste may also prove useful for fuelling biomass generators.

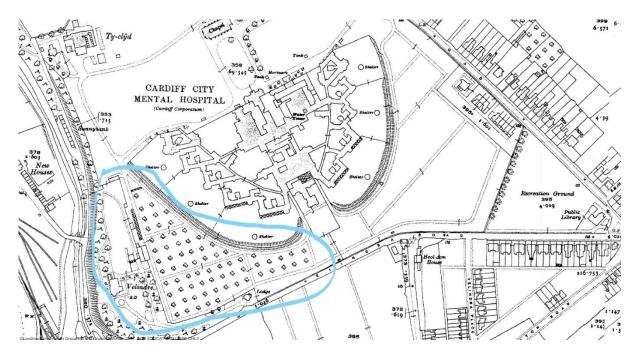


Figure 19: Map of Whitchurch Hospital in 1920, highlighted in blue are the farms and greenhouses (Digimap, 2020)



Figure 20: Satellite view Whitchurch hospital (Google, 2020)

The area marked in blue in figure 20 can be seen to be used for orchards and greenhouses in figure 19. This area could be utilized again with allotment plots allocated for each housing unit, to resemble more like the image in figure 21.



Figure 21: Imagining of an allotment at Whitchurch (BBC, 2020)

#### Water harvesting

The Welsh Government in 2019 be declared a Climate Emergency, and so the future and current sustainability on resources will be an important aspect on future developments (Welsh Government, 2019). The water tower for example, a landmark on the horizon and an example of elegant and useful working architecture, will be repurposed into a green energy hub, in tribute to its self-powering past through coal powered boilers (Fussell, 2020,11). Situated within the area highlighted in blue in figure 22, the water could house the water reuse systems, collecting the used grey-water, pumping it back into house facilities to be re-used again before being released to the sewers. By implementing water harvesting measures this would help lower freshwater wastage. Similar to that of the repurposed hotel in Kent. According to Water Wise around 30% of water used in the home is used for the flushing of toilets, 33% for washing and bathing and 4% for drinking (Water Wise. 2017). A greywater reuse system could purify the water once collected from its point of use such as the shower, or tap, and then recycles it to use for the toilets (City of Guelph, 2020.

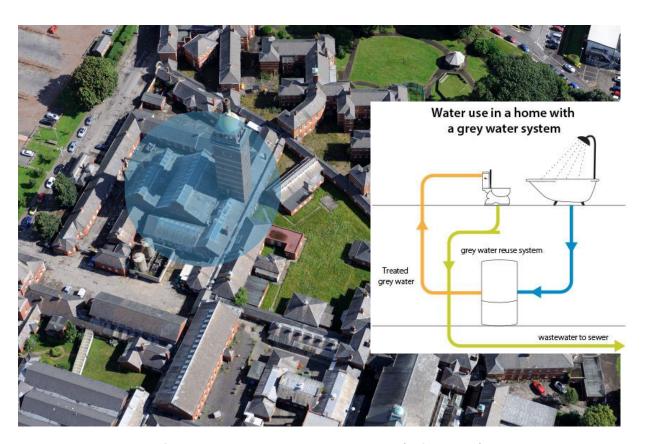


Figure 22: Aerial image of the water tower and boiler service rooms (Coflein, 2016), and water collection and use in home system diagram (City of Guelph. 2020).

Greywater recycling from taps, baths and washing machines could be used for garden irrigation, washing the car, flushing toilets and for laundry. Assuming a family of four greywater recycling can deal with up to 60% around 140,000 liters of water entering the house (Pullen, 2017). Rainwater harvesting for the allotments could be harvested from restored drainpipes and stored in aboveground water tanks as figure 24 demonstrates, due to its ease of installation on the ground feeding into bedding plants and allotments.



Figure 23: Current state of the drainpipes (Branford, 2020, p19)

Figure 24: Rainwater irrigation system possibilities (Waterirrigation. 2020)

#### **Energy and Heating**

Heating the accommodation units sustainably may be a challenge, ensuring that larger sized units, accompanied with high ceilings and large windows and doors, achieve comfortable living temperatures for dwellers. External elements like floors, walls and roofs may be required to be sufficiently insulated to Welsh government standards of Section 6; Material Change of Use in the Part L1b of building regulation compliance (Welsh Government, 2010, p19). Depending on the condition windows may require repair or replacement to a higher specification to reach U values not exceeding 3.3 W/m²K such as double glazing, to ensure draft-proofing and acoustic efficiency. The external masonry construction is cavity wall and generally built by a combination of red clay brick using Flemish, English and stretcher bonds with possible inclusion of cast iron wall ties (Branford, 2020, P21). Previous FSAP modelling of the wall reached a U-value of 0.88 W/m²K, Roof 2.3 W/m²K and ground W/m²K (Fussell, 2020 p16). This indicates that insulation may be required either externally or internally, the use of insulation boards internally could increase the walls thermal efficiency a U-

value of 0.55 W/m<sup>2</sup>K, and Roof 0.16 W/m<sup>2</sup>K although such measures should be looked into carefully to avoid creating moisture issues (Historic England, 2016, p14).

Introducing a green energy hub situated within the old boiler rooms, could provide a space for generating energy for the whole site, ensuring units are well heated in a low cost low carbon alternative. To ensure that the site is futureproof avoiding the use of fossil fuels would be beneficial. The installation of a CHP (Combined Heat and Power Partnership) system an energy efficient technology that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy (like steam) that can be used for space heating, cooling, domestic hot water and industrial processes (Ecoliving. 2020). CHP can be located at an individual facility or building, or a district energy or utility resource.



Figure 25: Simplifies diagram of a district heating system (Geo.2020)

As figure 25 shows, the implementation of a district heating system could provide power for the entire site from the biomass plant. A series of insulated pipes distribute hot water underground to each individual building in the district heating scheme. The flow and return within each pipe is usually connected to a heat exchanger in each property (Geo. 2020). Space heating for radiators, under floor heating or domestic hot water temperatures is then controlled in the same way that a traditional boiler would be. Where there are multiple units in social housing developments, a biomass district heating scheme can achieve up to 50% savings over heating oil (Treco,2018). To measure the usage in each building within the district heating scheme, a heat meter is fitted in each property and individual central heating bills can be easily calculated. One issue to take into consideration is that it can be an expensive form of heating based on its fuel source. But biomass

boilers provide an alternative possibility in renewable, low carbon heating. Subsidies may also be available for the installation of wood heating systems for example, biomass boilers are covered by the Enhanced Capital Allowance scheme in the UK (Styles et al, 2017, p451).



Figure 26: Happy families within multigenerational housing (Telegraph, 2018)

# Conclusion

In conclusion the proposal put forward draws upon the benefits of multigenerational and co-habitational living. Overall the development that's proposed aims to create a shared, co-operative healthy and low carbon generating community. Foremost it aims to tackle current and future issues related to loneliness and the housing crisis, climate change as well as the retention historic building stock that is significant to Cardiff's history in its growth and understanding of mental health. The idea also echoes elements of Whitchurch's sustainable past as an institution of rehabilitation, care and community forming a multigenerational development for all ages, putting Whitchurch at the forefront of creative modern living ensuring its sustainable future for many years to come.

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