



# Paul Hayes

Unit 504: Case Studies and Regional  
Work  
Part 2

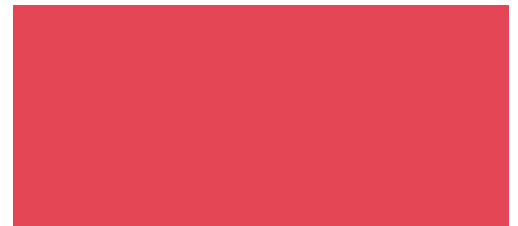
Whitchurch Mental Hospital,  
Cardiff, South Wales

Listing: Grade 2

Image Source: Flickr.com, Roath\_park\_mark,  
2006

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## Introduction

In the 1920's the Conservative MP Noel Skelton declared that the UK would be a 'Property owning democracy' this would free the ordinary person from the nannying from the council landlord. This term was then re-used by the incoming Margret Thatcher in the 1980's, leading to the selling of council houses to their tenants with the governments land mark 'right to buy scheme'. At the time this worked and house ownership went up from 9.7m to 12.5m and owning a home became a national obsession (Moore,2014).

Currently in the housing market demand is greater than supply, with the government targeting 300,000 homes a year (in England) being built by the end of 2020's (Wilson, 2020), 300,000 homes haven't been built in a year since the 1970's, before this drive to own homes (Osborne, 19). 2019 is the closest that house building has got to this target, with around 240,000 homes built. This may seem like a step in the right direction, however, these figures include nearly 30,000 homes controversially built in converted office blocks under permitted development rights, this is controversial as the space can be created smaller than they would be if they were new builds.

Since 2007 home ownership has been gradually dropping, this is thought to be partly due to a lack of stability and trust in the economy, which has in turn stopped people from moving as much. At the end of 2019 houses on the market were down 15% from the previous year (Trup, 2019). And, partly due to a change in the mind set of young people, not seeing a house as an investment due to the sacrifices they have to make to afford the high deposits needed, for example, the average house price in the CF14 post code is £302,000 (Zoopla, 2020) and a deposit of 5-10% needed for a mortgage (Onlinemortgageadvisor.co.uk, 2019), between £15,000-£30,000 would be needed to secure a property in the area, this is seen as unaffordable when the average UK wage is between £12,500-£30,000 (Webber et al, 2019), and whilst paying rent to private landlords (McRae, 2019).

This has seen a rise in the rental market as young people decide not to save and to live to their means to afford themselves the latest technology and a more fulfilling lifestyle (McRae, 2018). However, private dwellings are largely rented using assured short term tenancy agreements, this allows landlords to renegotiate contracts after very short periods of time generally between 6 months and 1 year. With rent increasing faster than inflation in the UK it puts the private renter in a bad position (Buy-to-let landlords, 2019). This also leads to private renters moving more often, around once every 4 years rather than once every 18 years in social housing (Power et al, 2015), making it difficult to integrate into a community.

This leaves the UK housing market at an impasse; is the current idea of a 'property owning democracy' still sustainable or relevant. This is discussed at length in the government white paper 'Tackling the undersupply of housing in

England' published on the 9th March 2020. In it Wilson (2020) identifies that the 2019 general election both the Liberal Democrats, the Labour Party and the Green Party identified social housing as a main part of their strategies within their election manifestos. This was a reaction to Shelter and KPMG report 'Building the homes we need: a programme for the 2015 government (2015)', which identified that the social housing sector was generally quicker to recover than the private housing sector after recession, this would mean in the periods after recession the quantity of houses being built would be impacted less (Wilson, 2020).

In 2015 when the joint Shelter and KPMG report was published local authorities were limited on housing spending by budget caps, however, under the recommendation of the House of Lords this was removed in 2018 (Wilson, 2020).

On face value social/council housing seems to be a way of securing the future for the young work force struggling with high rent and impossibly high house prices. The problem the social housing market faces is that it has a stigma attached to it. The right to buy scheme in the 1980's meant that a lot of the higher quality council housing was bought by their owners, this helped fuel the stigma of social housing as if you couldn't afford to buy your council house you were the poorest of the community, and generally lived in the poorer quality housing (Power et al, 2015). With modern housing associations this tends not to be the case, there is a broad array of people who rent through housing associations and the accommodation tends to be of a high standard (Power et al, 2015), even though they tend not to be the most interesting schemes architecturally (Moore, 2014).

### The Scheme

This scheme will look to provide high quality social housing that will not only provide secure long term rental properties, but will also be socially conscious and will take precedence from modern forward thinking schemes. Dedicated work units will allow people to walk to work and will also aim to be low carbon. The mixture of well designed refurbished and new build properties, open green spaces and the ability to work close to families and friends should help ease the stigma of social housing.

The design will draw inspiration from Quatermile in Edinburgh, As with the Foster designed scheme the new additions will utilise modern design and materials juxtaposed against the red brick buildings of Oatley and Skinners design (Hartley, 2020).

This document will concentrate on the development of the social housing scheme, however, a master plan for the remaining buildings and land will be put forward.

\*All the drawings and images in this document are by the author unless stated otherwise.

## Modern Social Housing

### Goldsmith Street, Mikhail Riches.

Modern social housing does not need to be dull, unattractive boxes as described by Moore (2014). Goldsmith Street in Norwich was shortlisted for the Sterling Prize in 2019. It revisits the idea of the terrace house, the terracing housing concept not only ensures economic use of the space available but it also brings communities closer together and promotes the feeling of community. The scheme is a mixture of both terrace housing and apartments and are of Passivhaus standard. The scheme incorporates open green spaces for socialising and a sense of openness (Crook, 2019)



Above: Goldsmith Street (Image: Lizzie Crook)

It is this sense of openness and community even though the scheme is of a high density that is to be brought into the Whitchurch hospital site.

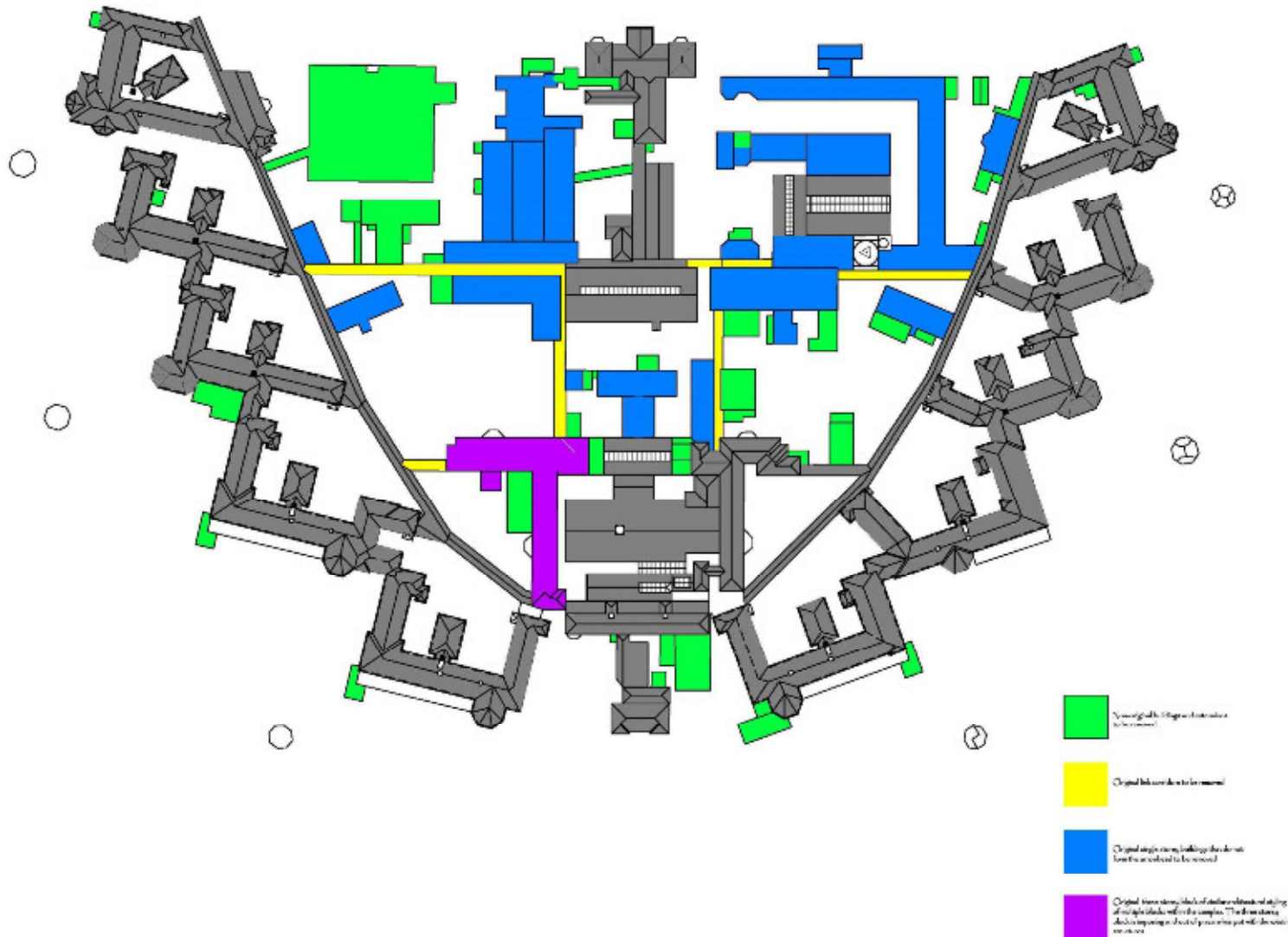


## Site Development



Cadw (1994) identifies the architecture of Oatley and Skinner as being one of the reasons for the listing being applied to Whitchurch Mental Hospital. Over the years a number of lower quality additions have been added (Cadw, 1994). With this in mind, it is evident that the newer additions (Green) hold little significance to the original structure and should be removed to unveil the original structure and forms.

The second reason Cadw (1994) give for the listing is that that Whitchurch Mental Hospital is the 'best example in Wales of a large mental hospital using echelon plan form'. It is intended that this arrowhead concept will remain, however, as with the Edinburgh Royal Infirmary development, the site is cluttered with original buildings that are in poor condition, of poor quality or having very little original material left within them. These buildings might hamper the development opportunity (Hartley, 2020), Branford (2020) identifies that like Edinburgh Royal Infirmary the condition of the buildings within the hospital site are in a poor state of repair. It is proposed that because of the state of repair and the cost associated with this, a portion of the less desirable single storey elements of the original hospital are to be demolished to open up the site (Blue). Not all the single storey structures will be removed, Gnoinska (2020) identifies several areas of significance (explored later in this document) which will be retained, another exception is that a three storey block (purple) will also be removed. This block whilst unique in being three storey, isn't unique architecturally across the site. Its position on the site caused significant shadowing across the site in the sun path analysis.



## Building Demolition



The plan (Left) shows the remaining structures after the demolition has been carried out. The remaining blocks were retained for the following reasons:

**Chapel:** The chapel is a unique structure on the site and would have been an important part of the rehabilitation for the patients of the hospital (Goosey, 2019)

**Main Entrance Building:** Cadw describe the entrance building as Renaissance (Cadw, 1994). This is the only instance of this style of architecture within the hospital.

**Water Tower:** Water towers were a common feature of Victorian asylum designs, they were often the tallest part of the asylum and because of this became local marks. This is the case with Whitchurch Mental Hospital (Gnoinska, 2020).

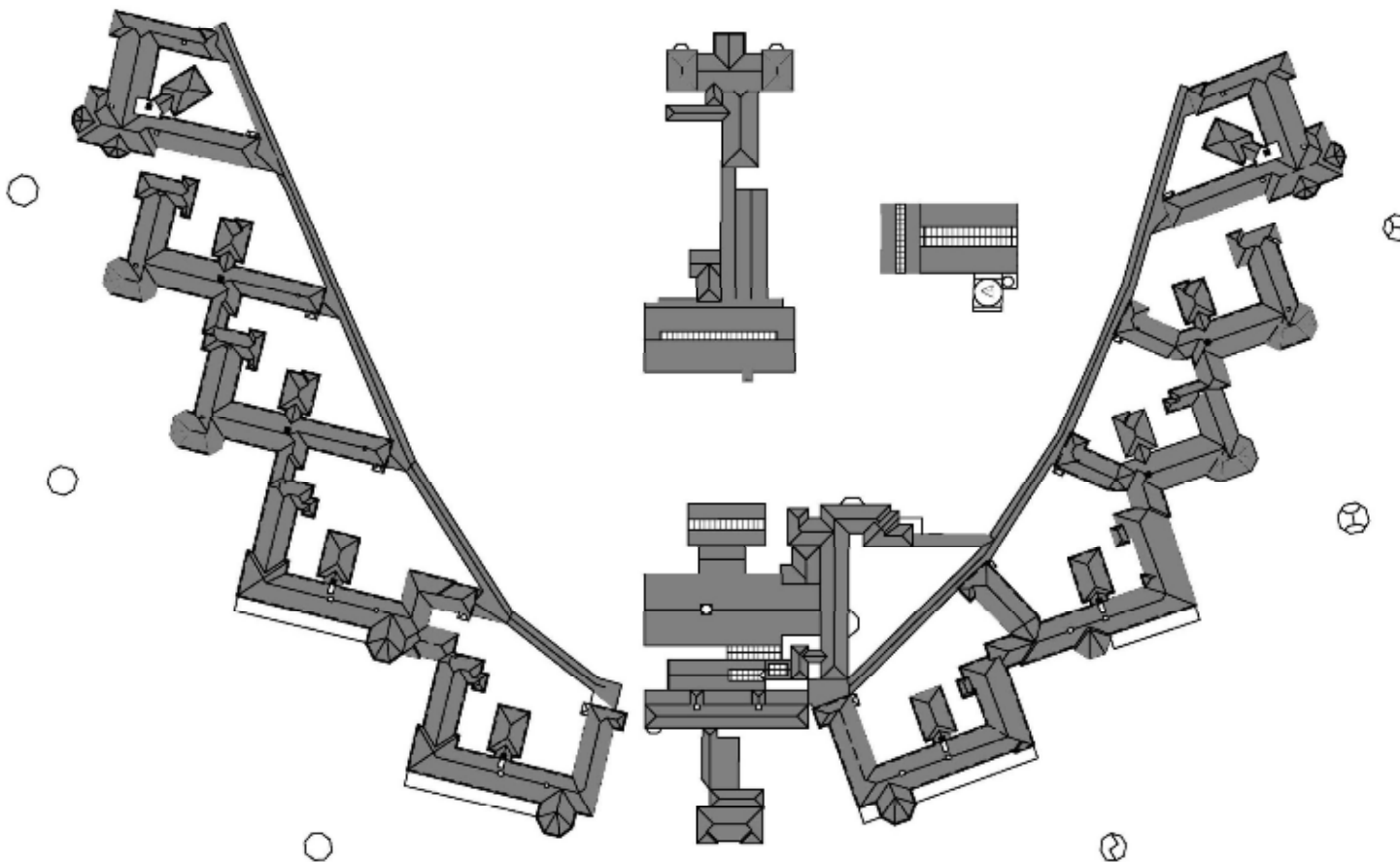
**Recreation Hall:** The recreations halls were more ornate than other areas within the asylum and became an area of expression in Otley and Skinners asylum designs (Gnoinska, 2020).

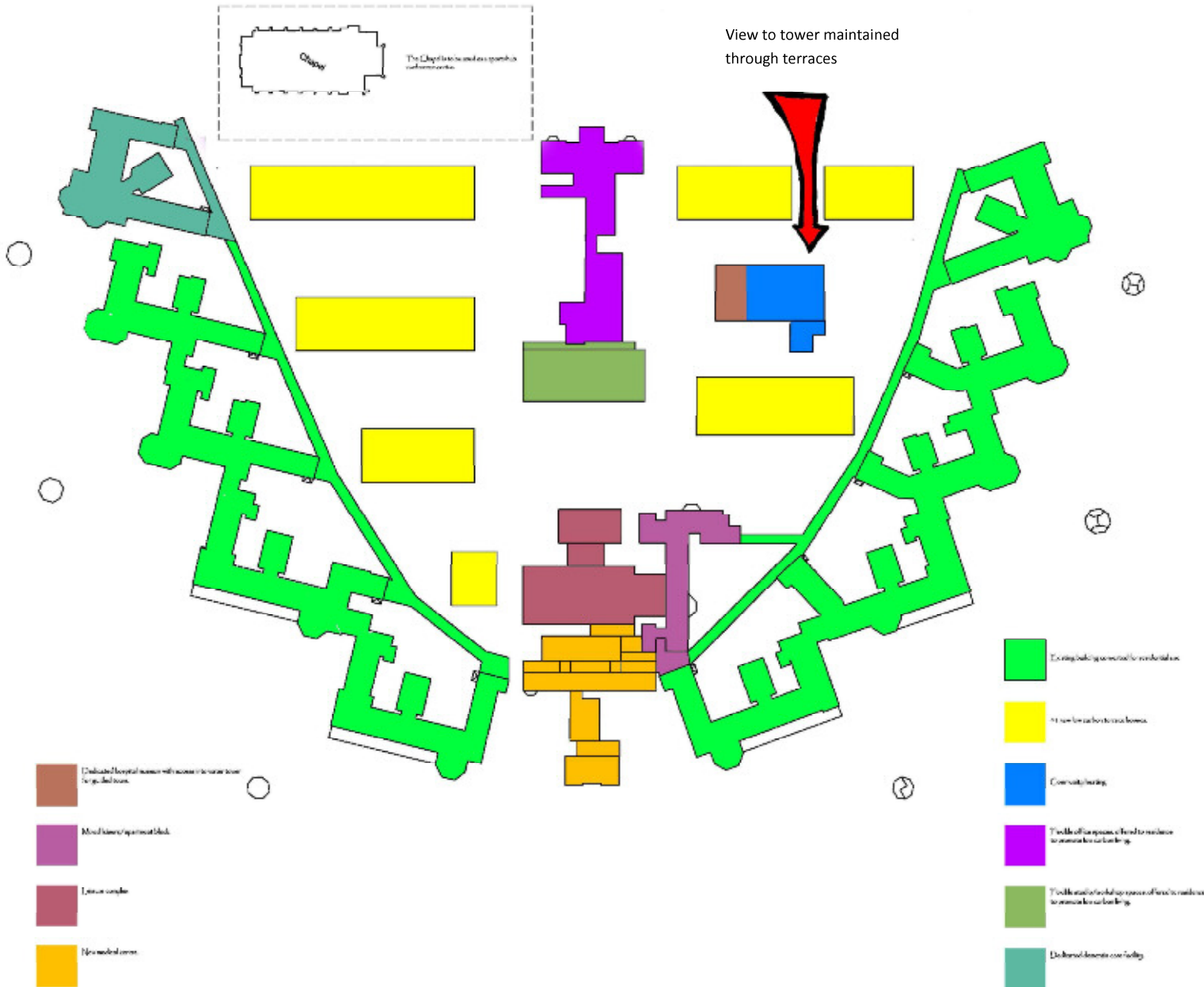
**Laboratories:** Whitchurch Mental Hospital was at one point one of the most respected research facilities in Europe (Gnoinska, 2020). The laboratories played a big role in this success.

**Communication Corridors:** One of the key features of the Echelon plan asylum was the communication corridors connecting the various blocks (Gnoinska, 2020) These are to be partly retained.

**Accommodation Blocks:** The accommodation blocks form the 'arrow head' of the echelon design (Gnoinska, 2020). All the exterior blocks are to be retained to maintain the essence of the original layout.

**Octagonal pavilions:** The pavilions are all individually listed. They would have played a significant roll in the rehabilitation of patients and given them an opportunity to sit a get fresh air (Goosey, 2019)





**Accommodation Blocks**— The accommodation blocks are to keep their original purpose. They are to be split into 1, 2 and 3 bedroom apartments (light green), this will also include the first floor of the inner block (purple). It is difficult for widows/widowers to downsize whilst in social housing (Wilson, 2020), for this reason one accommodation block (dark green) is to be converted into 1 bedroom dedicated over 55's.

**Octagonal Pavilion**—These are to be refurbished and used for as community gatherings.

**Corridors**— The remaining corridors are to remain and are to form covered streets connecting the apartment blocks with each other and the leisure suite.

**Boiler room and water tower (Blue)**— It is proposed that the boiler house will retain its original purpose. It will contain a pellet boiler forming part of a community heating scheme for both the houses and apartments. The water tower will be used to store rain water which is to be fed into toilet and washing machines within the apartments. The estate managers area (Brown) is to be donated to the Whitchurch hospital historic society to act as a museum space.

**Sports Hall (Burgundy)** —The sports hall and some of the surrounding buildings are to become a leisure complex for use of the residents and their guests. It is to include a rentable space for fitness classes. The leisure complex will also include the ground floor of the inner accommodation block (purple).

**The southern buildings (orange)** - These are to become a health centre. The area contained physio therapists, clinics and labs whilst the hospital was in operation, this will stay the case in its future use.

**Central area**—New 3 bedroom terrace houses with work units (Yellow).

**Chapel**—The chapel (White) is to be used as a sports hub for the various sports that take place within the fields around the hospital.

**Offices and General stores (light purple and olive green)**—These are to become offices and work units/studio spaces for the apartments.



(Image down one of one of the many long communication corridors prominent on the site: Yunfan Zhang 2019)

(All the drawings in this section are available to scale in appendix A)





Image 1: Car free streets



Shadow analysis—June 21st—September 21st—December 21st.

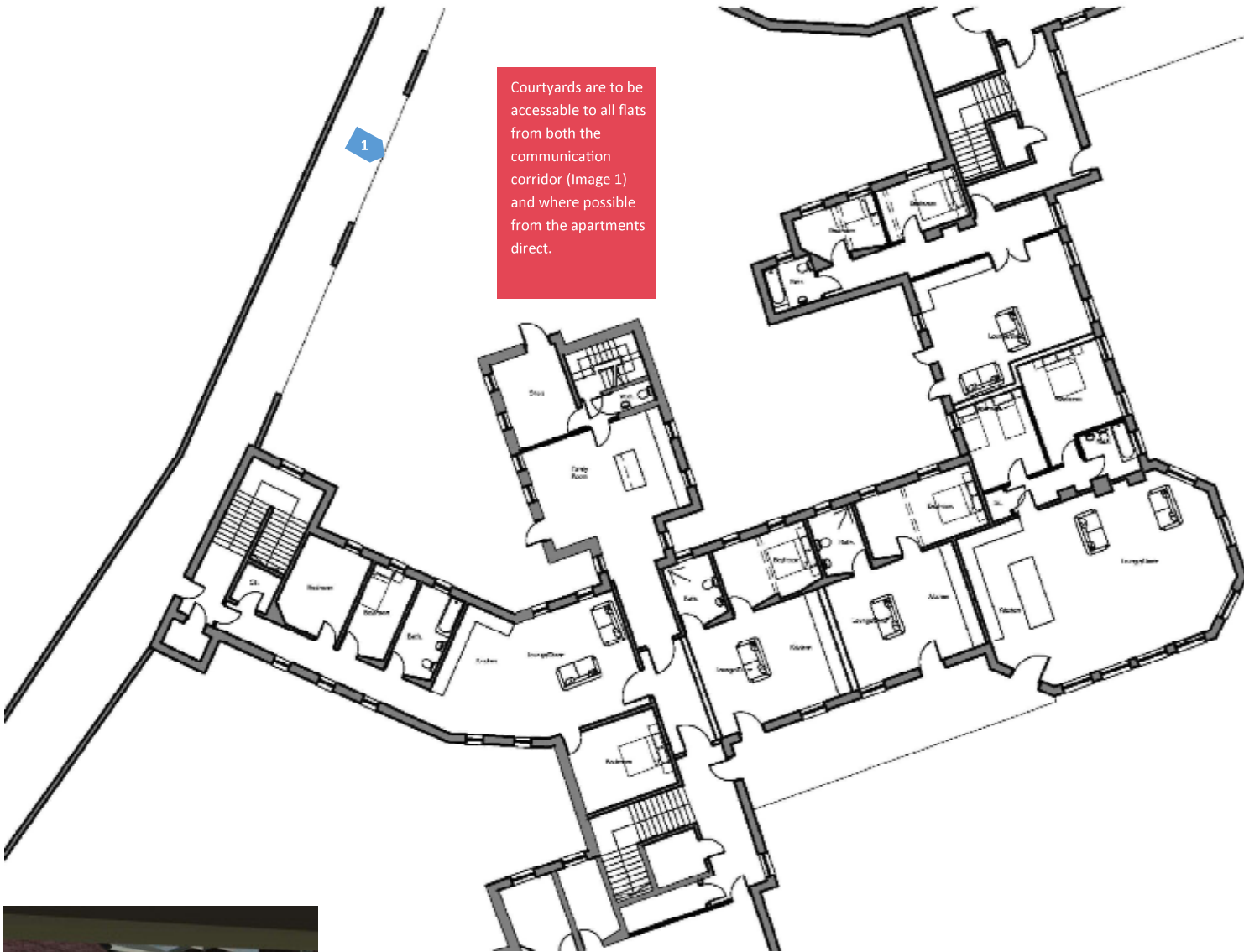


## Site Plan

The site is laid out to promote the feeling of a community, and encourage social interaction. All to often new estates are designed around the car, this means social interactions take place within private gardens rather than in public spaces (Cardiff, 2017). Within this design cars have been pulled to the outside of the site to promote green spaces within the street (Image 1) and around the apartments. This has allowed safe, over looked public streets to be formed within the design (Gonzalo, 2008), enough space has been left outside the houses to place a table and chairs to encourage socialising between families. The apartments have access to both the space wrapping around the site and private internal courtyards that are accessed from the covered streets.

Sun path analysis shows that the 'streets' and other green spaces receive direct sunlight between April and October as set out in Cardiff Council Supplementary planning guidance (2017), through this analysis a distance of 12.5m was set out between the streets to allow as much Sothern light into the buildings. Also, where possible the principal rooms of the apartments in the converted blocks are to be on the south side to maximise solar gains (Gonzalo, 2008). The new housing is set at 28 degrees from South, this should yield between 100 and 98% efficiency from the photovoltaic cells mounted on the roofs (uksolarpowerpanels, 2020). Images 2—4 show the shadow analysis, these images are taken at 11am on the 21st of June, September and December. Some building do experience overshadowing, however, this changes throughout the day.

Whitchurch Mental Hospital has a train station and a main shopping area within 10 mins walk and is on the main route of the busses heading into the city centre (Zhang, 2020), therefore provision has been made for just 1 parking space per household plus 1 visitors space per 3 houses, this is in line with the Welsh Housing Quality Standards (2016). Provisions for cycle storage is to be added to the site.



**Image 1:** Shared courtyard accessible from apartments and communication corridors.

### Example Floor plans

For the purpose of this proposal the layout of one of the mens accommodation blocks has been amended . The new layout seeks to keep a lot of the original building fabric to form useable apartments which are both comfortable and practical.

### The Ground floor consists of the following:

2 no. 2 bedroom 3 person apartments

75 m sq. & 90m sq.

2 no. 1 bedroom 2 person

45m sq. & 48m sq.

1 no. 2 bedroom, 4 person apartment.

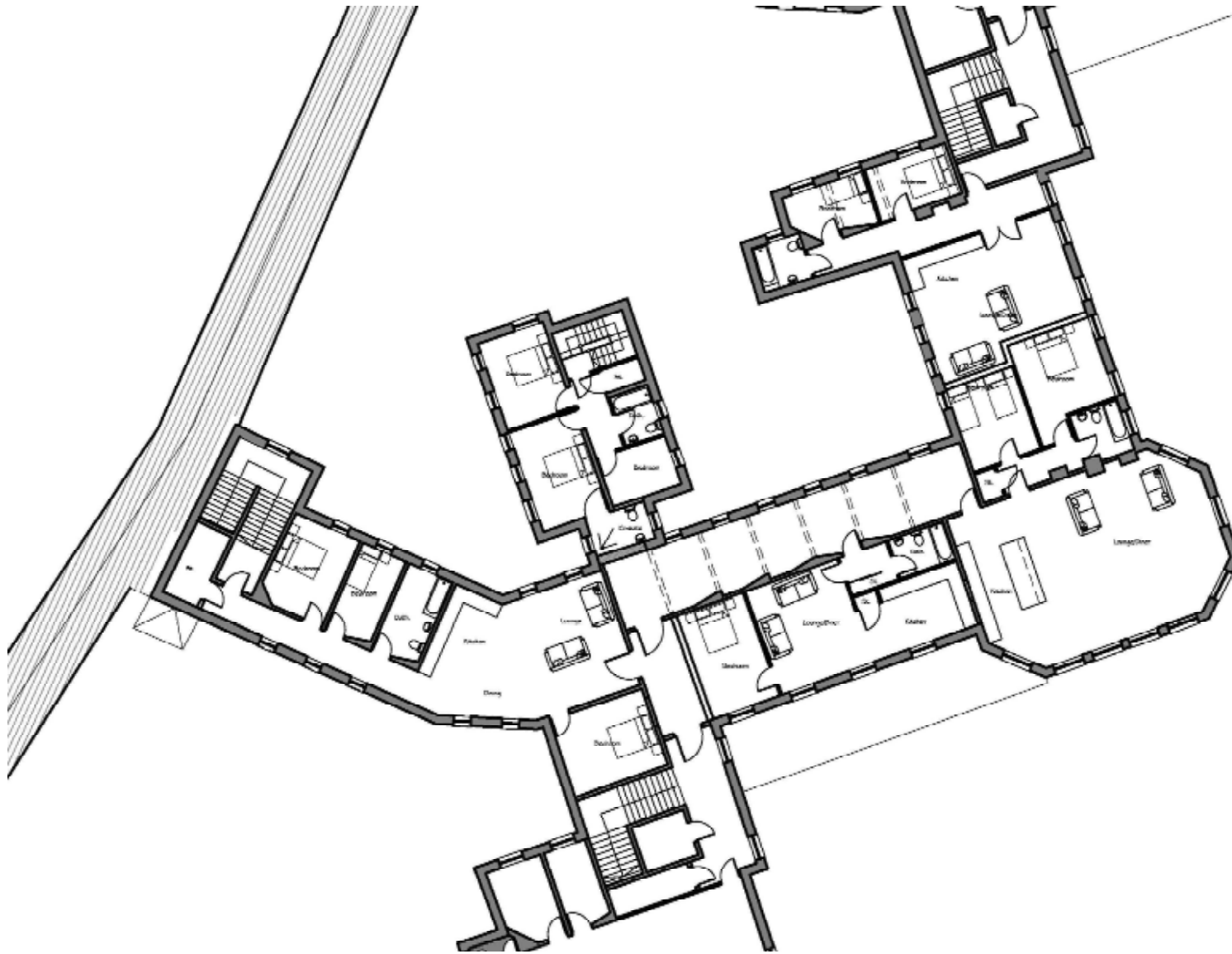
114m sq.

1 no. 3 bedroom, 5 person duplex apartment

102m sq. over 2 floors

The sizes of the apartments exceed the minimums laid out in the Welsh Housing Quality Standards (WQHS) (2016) with bedrooms and interior spaces to at least the minimum sizes.

As part of the WHQS (2016) energy efficiency of social housing must be addressed, with that in mind where possible the principal rooms have been kept to the South of the buildings, also, the original ventilation system is to be assessed, made safe and re-instated, this was taken into account when the apartments were formed and dictated which walls were removed and which were not. The existing courtyards are to be made accessible for all the flats wit the existing communications corridor being opened up to address these spaces.



### Example Floor plans

#### The First floor consists of the following:

2 no. 2 bedroom 3 person apartments

75 m sq. & 90m sq.

1 no. 1 bedroom 2 person

58m sq.

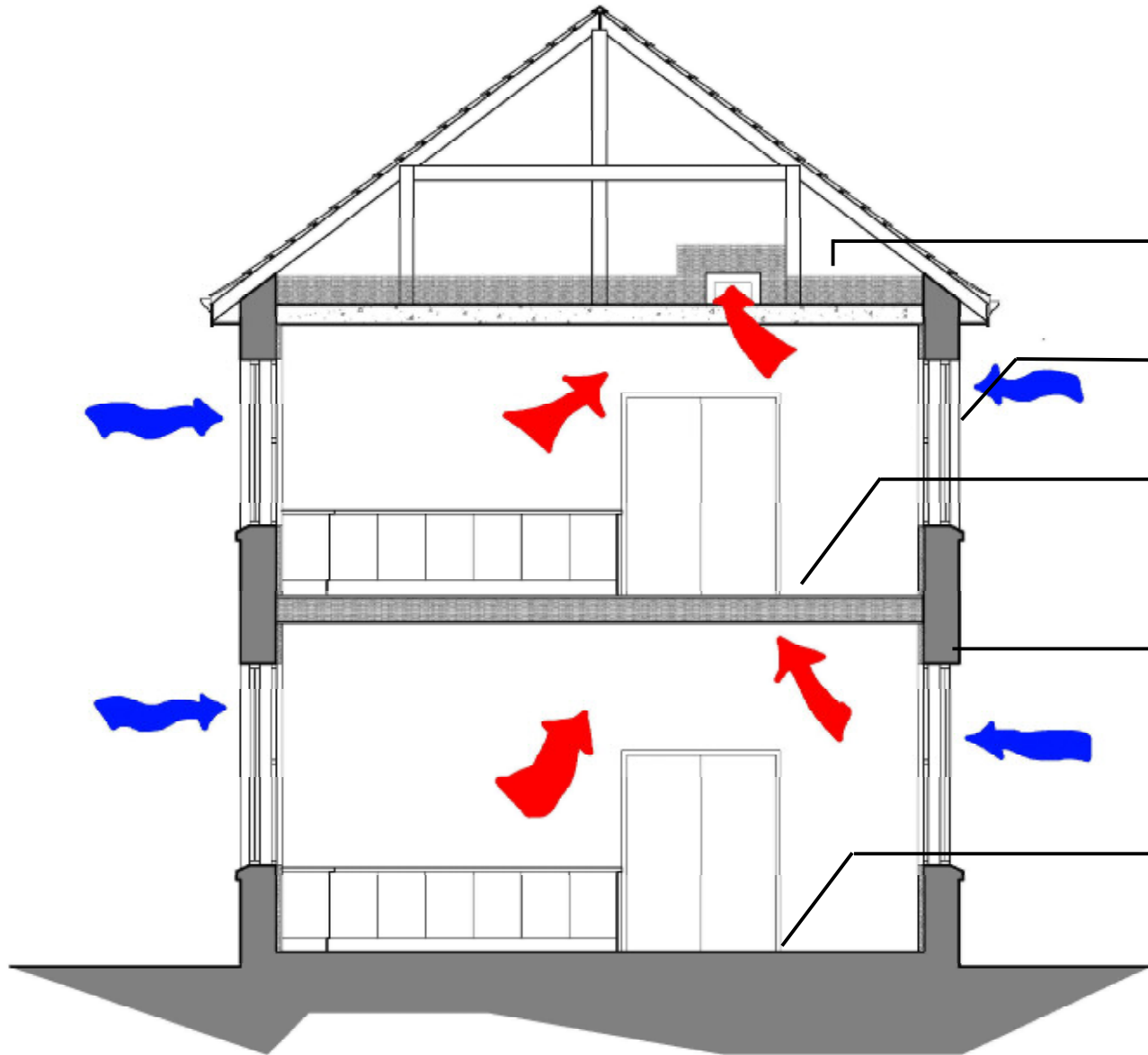
1 no. 2 bedroom, 4 person apartment.

114m sq.

1 no. 3 bedroom, 5 person duplex apartment

102m sq. over 2 floors

Each block should contain a minimum of 10 apartments, this would give approximately 105 apartments from the existing blocks, with a mix of 1,2 and 3 bedroom apartments to attract a variety of tenants.



### Sustainability

In the condition report (Banford, 2020) notes that there is very little originally material remaining in the accommodation blocks and what is left is in very poor condition. The lack of original fabric would mean that Historic England (2019) would place low significance on the interior of the blocks. With this being the case the refurbishment is to involve improving the thermal efficiency of the building. The improvements will be as follows:

**Roof:** 250mm of breathable Thermafleece is to be installed in 2 no. layers to provide a U'valie of 0.16 w/m sq.K in accordance with part L of the building regulations (Hayes, 2019).

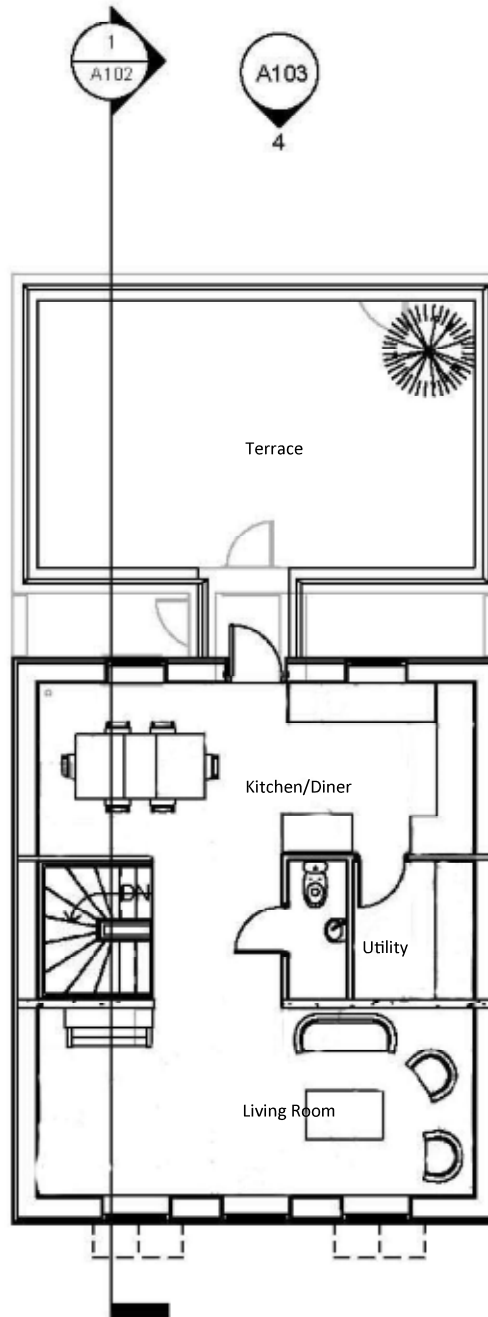
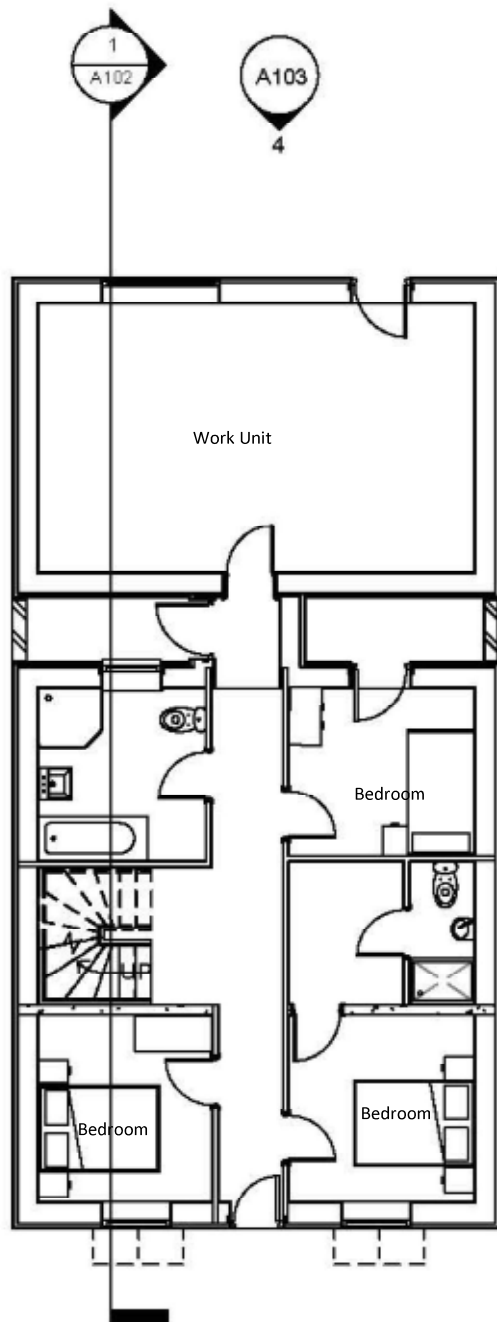
**Windows:** Where possible the original sash windows are to be retained. Historic England recommend repairing the original sash windows, installing draught excluders and secondary glazing (Hayes, 2019).

**Intermediate Floors:** The building regulations (approved document E) allow special dispensation for historic building. It allows an improvement for sound insulation but does not set a value (Pike, 2011). With this in mind and acoustic insulation is to be installed within the void of the timber floors.

**Walls:** Wall to be built up using breathable Pavex Pavawall wood fibre insulation (Pavawall, 2020) with 3mm lime plaster finish. This is to achieve a U'valie of 0.32 w/m sq.k (See appendix B). This is below the 0.3 w/m sq.k set out in part L of the building regulation (Fussell, 2020) but will avoid losing too much of the internal space available in some rooms.

**Ground Floor:** Historic England identify heatloss of around only 2% through floors. As this is so low the floors are to be left in-situ to maintain the historic material.

**Rain water:** If possible the rainwater is to be collected and stored within the water tower. This wil then be re-used in washing machines and toilets within the apartments.



### 3 Bedroom Houses

In the book 'Passive House Design', Gonzalo (2008) suggests that a terrace of dwellings is a more energy efficient way to build due to there being less surface area exposed to the outside air. With this in mind the houses will be set out in rows of terraces.

As shown on the site plan, the terraces are to be facing near south, large windows are to be placed on the South face with a solid wall adding thermal mass at the rear of the bedroom/lounge.

The properties are to be 115 m sq. 3 bedroom 5 person dwellings in line with the WQHS (2016), there is the addition of a work space to the ground floor to promote working from home. The space is configurable as both a workshop and office configuration.

Due to the work space being on the ground floor, it is proposed that the property is to be an upside-down house with a roof terrace on top of the work space. This will make efficient use of the plan and allow more open green public spaces around the property.

Access to the roof terrace is from the kitchen, this allows observation of the terrace from the house allowing children to play on the terrace under the watchful eye of the parent, this is in line with the WQHS (2018).



## Materials Finishes

### Work Unit

The work units to the north of the properties are to re-use the brickwork from the site demolition. All balustrades are to be glass to avoid too much over shadowing onto the public areas (Image 3)

### Main House

The main property is to be finished in sustainable softwood timber.

Roofs are to be natural slate to match the existing hospital buildings.

Windows and doors are to be powdercoated aluminium triple glazed high performance windows.

Galvanised Bris Soleil are to be installed over the ground floor windows.

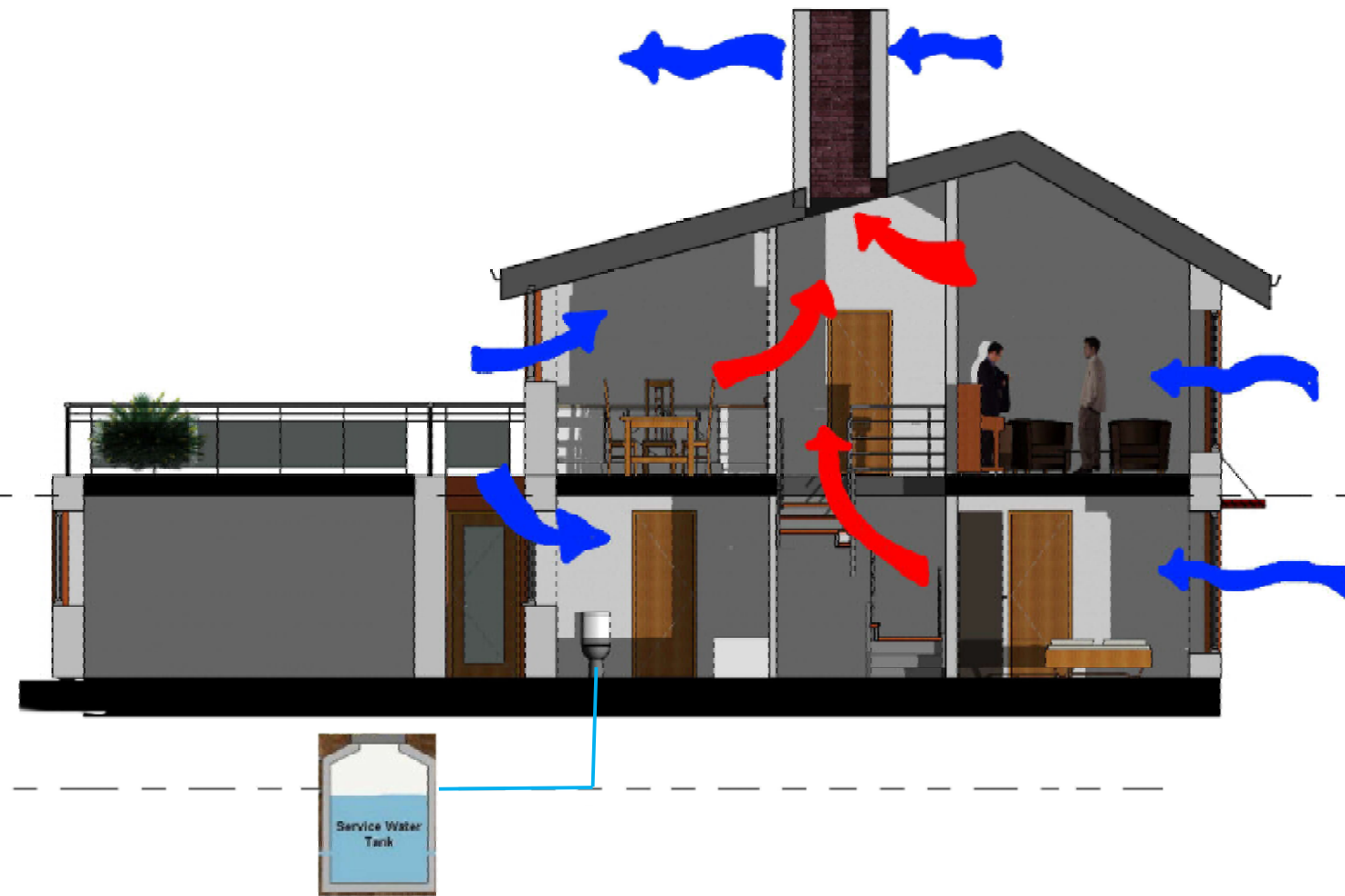
The materials and design of the terraces are to contrast against the design of the hospital (CADW, 2020)



**Images 1 & 2:** These images show the internal spaces within the houses. They to be open plan light with high ceilings. The quality of the spaces within the houses and apartments are important to promote high quality living and move away from the run down and ordinary image that social housing has (Crook, 2019).

**Images 3:** The 'streets' between the terraces are easily observable from the terraces and living rooms of the houses. The lightweight materials and low rise design contrasts against the existing hospital buildings (CADW, 2020)

## Houses : 3d Images



### Sustainability

**Stack Ventilation:** To mimic the existing building, stack ventilation is to be employed within the terraces. The ventilators will be simpler in design as to not detract from the Victorian stacks on the existing hospital buildings and will also be used to bring light into the interior of the house (Gonzalo, 2008).

**Solar shading:** Bris Soleil and overhanging roofs to the South face of the property are to provide summer shading, however allow the sun to penetrate the building in the winter to take advantage of the thermal mass designed into the fabric (Gonzalo, 2008).

**External Envelope:** The main house is to be built using a timber frame construction wrapped over junctions to avoid cold bridging. The  $u$ -value for the building envelope is to be  $0.1 \text{ w/m sq k}$ . (Gonzalo, 2008).

**Roof:** The roof is to be pitched at 15 degrees on the North face to allow light to hit the terraces behind (see the shadow analysis: page 8), the South facing roof will be pitched at 30 degrees to increase the efficiency of the solar panels (UKsolarpowerpanels, 2020).

**Grey Water:** Rainwater is to be collected in individual tanks and re-used within the house for flushing the toilets and washing clothes (Gonzalo, 2008).

**Heating:** The houses are to be linked into the community heating scheme.

## Conclusion

Whitchurch Mental Hospital is falling into a state of disrepair and it is becoming increasingly important that a use for the site is found, as the site has only been closed since 2016 (4 years) (Branford, 2020), this is a worrying amount of decay.

With the level of demolition being proposed, this could be viewed as an extreme solution, however, the essence of the site and the arrow head configuration would be retained. Also, many of the uses for the building remaining will be retained, the accommodation remains accommodation, the recreation space would still be for recreation, offices for offices and surgeries and treatment rooms used as a medical centre. The provision of affordably, high quality, rentable housing in one of the most expensive parts of Cardiff, coupled with long leases would also give people security, it will also give people the ability to afford to live near loved ones aiding their mental health. Further studies will need to be made to check the feasibility of the proposed office, leisure, medical and sport spaces work. The leisure facility has been started in sketch form and appears to work, this can be seen in appendix A. Further investigation into the feasibility of the medical centre would need to be conducted, there are several doctors surgeries and other medical practices in the area (Zhang, 2020) and these should be consulted as to whether moving to a facility like this would benefit them and the wider community.



## Appendix A

### To Scale Drawings

## Appendix B

### U'Value Calculation

$$U = 1/(0.1/1.6 + 0.21/1.6 + 0.02/0.044 + 0.08/0.039 + 0.003/0.044 + 0.04 + 0.13 + 0.18)$$

$$U = 1/0.0625 + 0.013125 + 0.455 + 2.05 + 0.068 + 0.04 + 0.13 + 0.18$$

$$U = 1/3.12$$

$$U = 0.32 \text{ w/m sq.K}$$

## References

- CADW. 2002. 117115, Summary of Listed Buildings. <https://cadwpublic-api.azurewebsites.net/reports/listedbuilding/FullReport?lang=&id=11715> [Accessed 04/12/2019]
- Hayes. P. 2019. 503—Energy Use in Historic Buildings
- Osborne H.2019. House Building in England at 30 year high government data shows. <https://www.theguardian.com/society/2019/nov/14/house-building-in-england-at-30-year-high-government-data-show> [Accessed 22/05/2020]
- Trup, R. 2019 . Housing market trends. <https://www.propertyreporter.co.uk/property/housing-market-trends-for-2020.html> [Accessed 22/05/2020]
- Mcrae, H. 2018. Young people lack the capacity to save. <https://www.independent.co.uk/voices/saving-money-young-people-millennials-pensions-welfare-state-savings-account-a8571941.html> [Accessed 22/05/2020]
- Zoopla. 2020. Average house prices. <https://www.zoopla.co.uk/house-prices/cf14/> [Accessed 22/05/2020]
- Onlinemortgageadvisor. 2020. What deposit is needed for a mortgage. <https://www.onlinemortgageadvisor.co.uk/deposits/what-deposit-is-needed-for-a-mortgage/> [Accessed 22/05/2020]
- Webber, D and Mann, O. 2019. House hold disposable income. <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyearending2019provisional>
- Wilson, W. 2020. Tackling the undersupply of housing in England. <https://researchbriefings.files.parliament.uk/documents/CBP-7671/CBP-7671.pdf> [Accessed 22/05/2020]
- Power, A and Provan, B. 2015. Overcoming the stigma of social housing. <http://sticerd.lse.ac.uk/dps/case/cr/casereport116.pdf> overcoming the stigma of social housing— [Accessed 22/05/2020]
- Crook, L.2019. Goldsmith Street Social Housing [https://www.dezeen.com/2019/08/01/goldsmith-street-social-housing-mikhail-riches-norwich/?li\\_source=LI&li\\_medium=bottom\\_block\\_1](https://www.dezeen.com/2019/08/01/goldsmith-street-social-housing-mikhail-riches-norwich/?li_source=LI&li_medium=bottom_block_1) [Accessed 22/05/2020]
- UKsolarpowerpanels. 2020. solar panel efficiency. <http://www.uksolarpowerpanels.co.uk/designing-solar-installations.php> [Accessed 22/05/2020]
- Historic England.2019. Statement of heritage significance. <https://historicengland.org.uk/images-books/publications/statements-heritage-significance-advice-note-12/> - [Accessed 22/05/2020]
- Pike, 2011. Sound insulation in historic builings. <https://www.buildingconservation.com/articles/soundinsulation/soundinsulation.htm> [Accessed 22/05/2020]
- Pavawall. 2020. Pavatex Pavawall Insulation. [https://www.pavatex.com/uploads/tx\\_sbdowloader/PAVAWALL\\_engl.pdf](https://www.pavatex.com/uploads/tx_sbdowloader/PAVAWALL_engl.pdf). [Accessed 22/05/2020]
- <https://cadw.gov.wales/advice-support/conservation-principles/conservation-principles> [Accessed 22/05/2020]
- Gnoinska, N and Hughes, L. 2020. ART504: Case studies and regional work: Significance: Site history both tangible and intangible
- Zhang.Y. 2020 Whitchurch hospital. Fabric 1: Site plans, photographs and survey
- Branford, P. 2020. ART504: Case studies and regional work: Condition appraisal of Whitchurch Hospital
- Fussel, C. 2020. ART504: Case studies and regional work: Energy Use at Whitchurch Hospital
- Hartley, R. 2020. ART504: Case studies and regional work: Precedents: A Critical analysis of relevant case studies relating to the after use of former mental health asylums within the UK.
- Interview Mackie, P October 2019
- <https://www.buyassociation.co.uk/2019/11/19/how-the-uk-rental-market-might-change-over-the-next-five-years/> Buy-to-let landlords, 2019 [Accessed 22/05/2020]
- Goosey. T Interview by Paul Hayes 4th December 2019
- Hayes. J. Interview by Paul Hayes 4th December 2019