

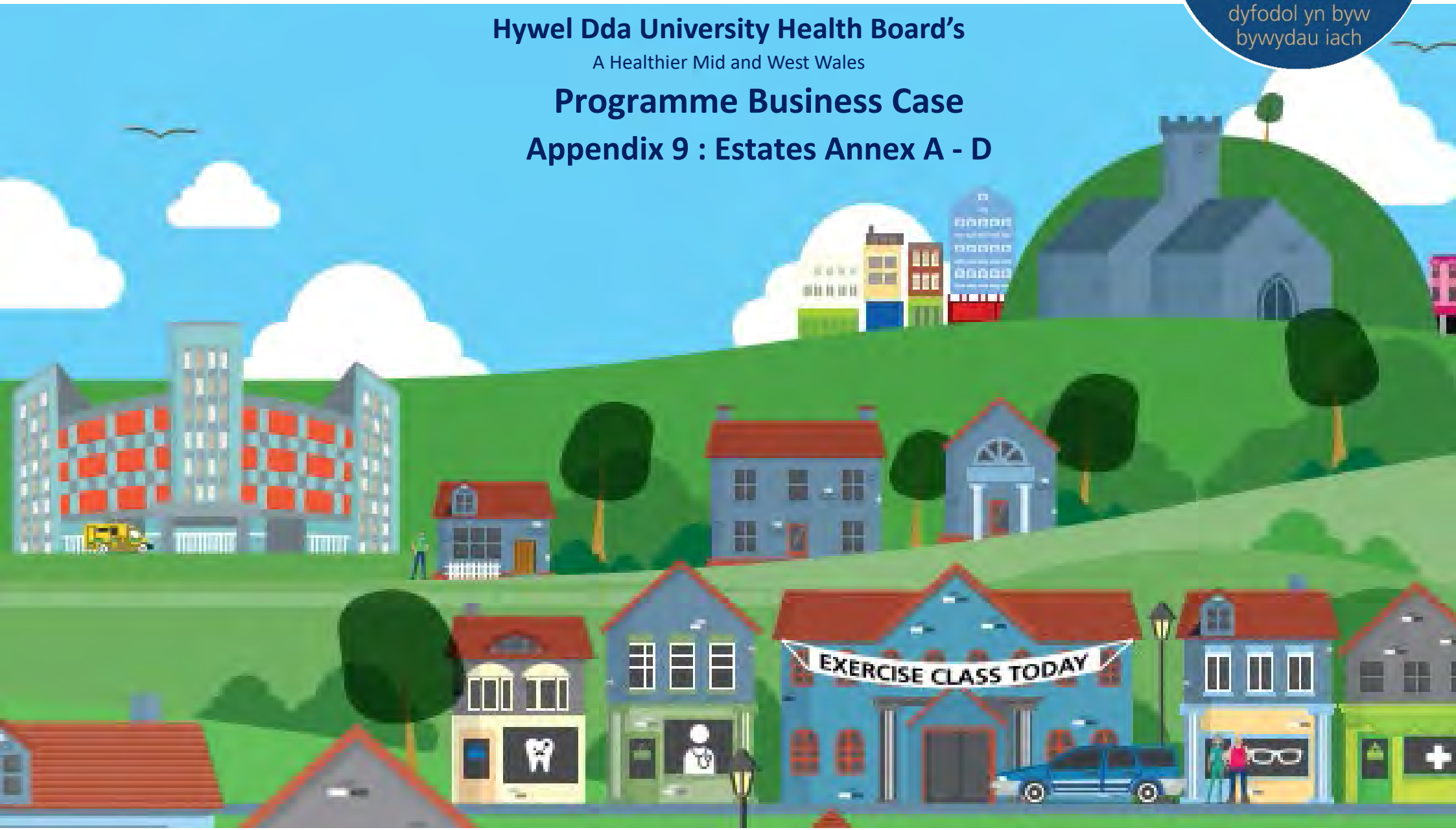
Date: 2021/2022

Hywel Dda University Health Board's

A Healthier Mid and West Wales

Programme Business Case

Appendix 9 : Estates Annex A - D





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Hywel Dda
University Health Board



Hywel Dda University Health Board

A Healthier Mid & West Wales: Transforming our Hospitals
Programme Business Case



Estates Annex

January 2022



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Revision History

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1. Introduction

1.

Strategic Context

Hywel Dda University Health Board (HDdUHB) has developed a Programme Business Case (PBC) and supporting Estates Annexe to secure the capital funding required to support delivery of the UHB's Health & Care Strategy; "A Healthier Mid & West Wales: Our Future Generations Living Well" following the outcome of its previous public consultation exercise and subsequent HDdUHB Board decisions in November 2018.

The PBC includes consideration of the aspiration to transform both the acute hospital estate and the associated implications on the integrated community health and wellbeing facilities. The review of the acute hospitals includes consideration of a of a new Urgent and Planned Care Hospital on a site which is yet to be agreed and the repurposing of the existing Withybush and Glangwili Hospital sites in Haverfordwest and Carmarthen. It also considers the implications of the strategy for the Bronglais and Prince Phillip Hospital sites in Aberystwyth and Llanelli.

Two separate Programme Business Cases have been prepared in parallel to this exercise. One to consider the impact on Mental Health and Learning Disabilities services and one to consider measures required across the existing estate in order to maintain business continuity in the short to medium term during the development of the detailed Business Cases and delivery of key projects which will follow the completion of this PBC.

The PBC is underpinned by activity, financial and workforce modelling undertaken as a separate exercise by the HDdUHB and this estates annexe will explore an initial range of estates options.

This estates annex document and associated appendices broadly follows the stages described in 'Developing an Estates Strategy':

- Stage 1: Where are we now?
- Stage 2: Where do we want to be?
- Stage 3: How do we get there?

Existing Estate

The existing HDdUHB estate covers circa 52 hectares across the counties of Carmarthenshire, Ceredigion and Pembrokeshire. The total gross internal floor area of the 14 acute and community hospital sites as taken from the latest Data Report is 189,613sqm.

Overall the Health Board owns 57 separate sites including 4 Acute hospitals, 5 community hospitals, 2 integrated care centres as well as various community Health Centres, GP practices, Mental health, learning disabilities and substance misuse facilities. dental practices and community pharmacies,

The estate buildings range with buildings which range in age from 19th Century to modern day and with varying degrees of functionality, condition and performance. Almost 40% of the estate is over 50 years old and this age profile has implications on backlog maintenance and on the ability to deliver safe, modern healthcare.

A wide range of clinical areas are non-compliant when compared to current healthcare design guidance and this has an impact on both service delivery and patient experience. There are significant issues with upgrading these areas to meet current standard including service disruption and a potential reduction in capacity in order to meet current area standards.

Strategic aims

The aim of this PBC process is to deliver a strategy for transforming clinical services in Mid and West Wales ensuring that they are Safe, Sustainable, Accessible and Kind.

- Transforming the way HDdUHB works to prioritise the delivery of SAFE and high quality care.
- Committing to provide SUSTAINABLE services, fit for future generations, both in terms of workforce and finances.
- Improving ACCESSIBILITY to health and care services for patients by addressing internal flows throughout the system.
- Listening to patients and ensuring that improvements support the delivery of KIND and compassionate healthcare, and to value the contributions made by all HDdUHB staff.

The Health Board have defined these four key principles as being critical to the development of future health services.



Cardigan Integrated Care Centre



Glangwili General Hospital Carmarthen

1. Introduction

1.

Estates Annex

There is no definitive guidance on the contents of an Estates Annex however it is important that this document and associated appendices delivers the appropriate information to support a robust Programme Business Case and based on the required outputs for the Masterplan Team the following contents are included;

- Executive summary
- Estates investment objectives
- Summary of Health Board estates strategy
- Description of the existing estate
- Existing estate site plans
- Current estate performance information
- Functional suitability, space utilisation, statutory compliance
- Physical condition, energy performance, backlog
- Maintenance liability
- Estate performance improvement targets
- Description of proposed functional content
- Project design principles
- Modern Methods of Construction (MMC)
- Statement of Net Zero Carbon (NZC) commitment
- Proposed project estate options to include;
 - Estate options for a New Build Urgent and Planned Care Acute Hospital
 - Estate options for repurposing of Withybush General Hospital (WGH) & Glangwili General Hospital (GGH) whilst taking account of HDdUHB proposed Business Continuity Programmes.
 - Estate options for the refurbishment of the existing Bronglais General Hospital (BGH) & Prince Phillip Hospital (PPH) whilst taking account of HDdUHB proposed Business Continuity Programmes.
 - Estate options for delivery of the new community model of care to consist of new, existing and repurposing of existing facilities.
- Capital costs and projected cashflows
- Description of implementation options



Trawsnewid ein gwasanaeth iechyd

Hywel Dda

Our big NHS change

2. The Basis of Our Design

General Considerations

During the initial phase of the Programme Business Case works the team developed a more detailed understanding of the existing condition, proposed technical approach and the design parameters to be used to meet the Health Board's. This initial discovery exercise established 'where we are now' and formed the basis of design for the estate annex.

Key objectives were established as a baseline and used to inform the development of ideas through the following stages of work.

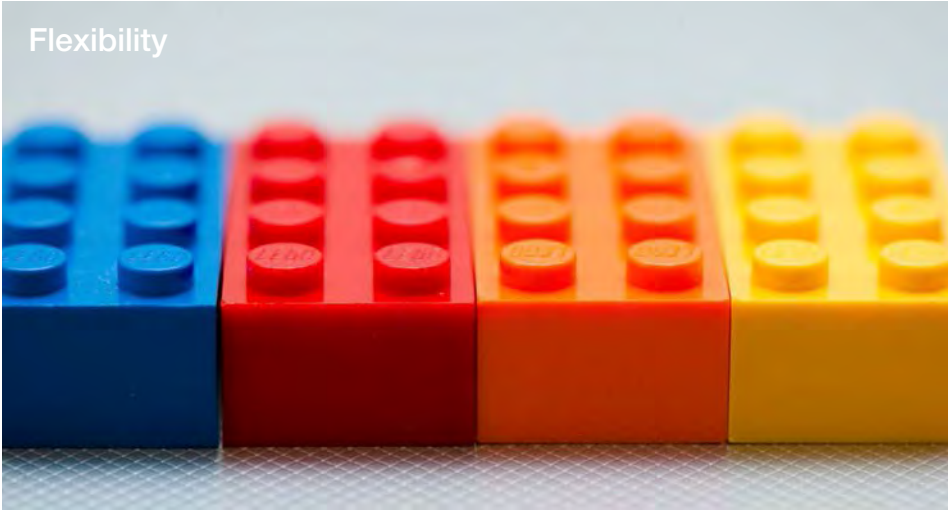
The 'basis-of design' section includes descriptions of high level principals, concepts, design guidance, assumptions, derogations, decisions and risks.

This approach has helped to structure our dialogue with key stakeholders on what makes this masterplanning project unique and what can developed from a standard approach - focusing energy on the areas that add value.

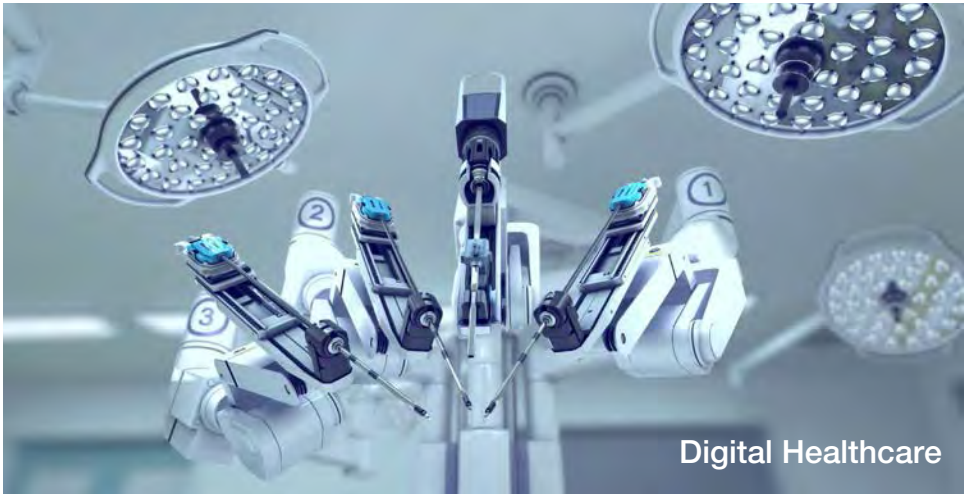
In this case the design strategies in Section 9 are a key element of the 'basis-of-design', suggesting areas where added value can be maximised through early consideration and inclusion in the masterplan proposals.

We have identified a number of key principles which have been outlined in our design strategies:

- Urban & Social integration
- Patient centres design
- Staff attraction & retention
- Agile working strategies
- Flexibility in Design
- Modern Methods of construction: Structure & fabric
- Modern Methods of construction: Engineering systems
- Digitally enabled healthcare
- Route to Zero carbon
- Transport



Evidence Based Design	Single-bed rooms	Access to daylight	Appropriate lighting	Views of nature	Family zone in	Carpeting	Noise-reducing finishes	Ceiling lifts	Nursing floor layout	Decentralised supplies	Acuity-adaptable rooms
Reduced HAI	2										
Reduced medical errors	1		1				1				1
Reduced patient falls	1		1		1	1			1		1
Reduced pain		1	1	2			1				
Improved patient sleep	2	1	1				1				
Reduced patient stress	1	1	1	2	1		2				
Reduced depression		2	2	1	1						
Reduced length of stay		1	1	1							1
Improved patient privacy	2				1		1				
Improved communication	2				1		1				
Improved social support	1				1	1					
Increased patient satisfaction	2	1	1	1	1	1	1				
Decreased staff injuries								2			1
Decreased staff stress	1	1	1	1			1				
Increased staff effectiveness	1		1				1		1	1	1
Increased staff satisfaction	1	1	1	1			1				



2. The Basis of Our Design

2.

The constitution of the World Health Organisation (WHO) defines health not only as the absence of disease or infirmity, but also as ‘a state of complete physical, mental and social well-being.’ It emphasises that people should enjoy the highest attainable standard of health, saying it is ‘one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.’

WHO’s statement highlights the fact that health is about the whole person, mentally and physically, and touches on societal influences which we know affect health and health inequalities. These aims are closely aligned with the aspirations of the Wellbeing of Future Generations (Wales) Act 2015 including;

- Making healthcare more equitable and accessible
- Supporting place-making and designing-in community health and well-being
- Creating cohesive well-connected communities to address issues such as loneliness
- Encouraging physical activity
- Making the most of natural green and blue space to support well-being.
- Ensuring that we use natural resources efficiently

Guidance

Following the principles of the Welsh Government vision; “A Healthier Wales: our plan for Health and Social Care” the masterplan aims to make best use of the existing and proposed estate. The business case proposals are benchmarked against model hospital parameters and follow all relevant active Welsh Health Building Notes and Technical Memorandum guidance.

Where appropriate, challenge has been raised via benchmarking or best practice to determine optimal solutions.

Guidance from NHS Wales Shared Services Partnership on developing the Programme Business Case information has also supported the development of this estates annex, particularly on items such as modern methods of construction, digital Strategy and de-carbonisation.



Bispebjerg Hospital Masterplan

3. Health Board Vision

Hywel Dda University Health Board (HDdUHB) was established on 1 October 2009 from the merger of the Hywel Dda NHS Trust, the Pembrokeshire Local Health Board, Ceredigion Local Health Board and Carmarthenshire Local Health Board.

The Health Board provides healthcare services to a total population of around 387,300 people throughout Carmarthenshire, Ceredigion and Pembrokeshire as well as providing some clinical services to the populations of Powys and South Gwynedd. During 2020/21 the Health Board employed 12,476 staff and provided primary, community, in-hospital, mental health and learning disabilities services for a quarter of the landmass of Wales.

The existing HDdUHB estate covers 52 hectares and has a total gross internal floor area of 189,613sqm including all acute and community facilities as follows;

- The four acute hospitals are,
- Bronglais General Hospital, Aberystwyth
 - Glangwili General Hospital, Carmarthen
 - Prince Philip Hospital, Llanelli
 - Withybush General Hospital, Haverfordwest

- The five community hospitals are,
- Amman Valley Community Hospital
 - Llandovery Hospital
 - South Pembrokeshire Hospital
 - Tenby Hospital
 - Tregaron Hospital

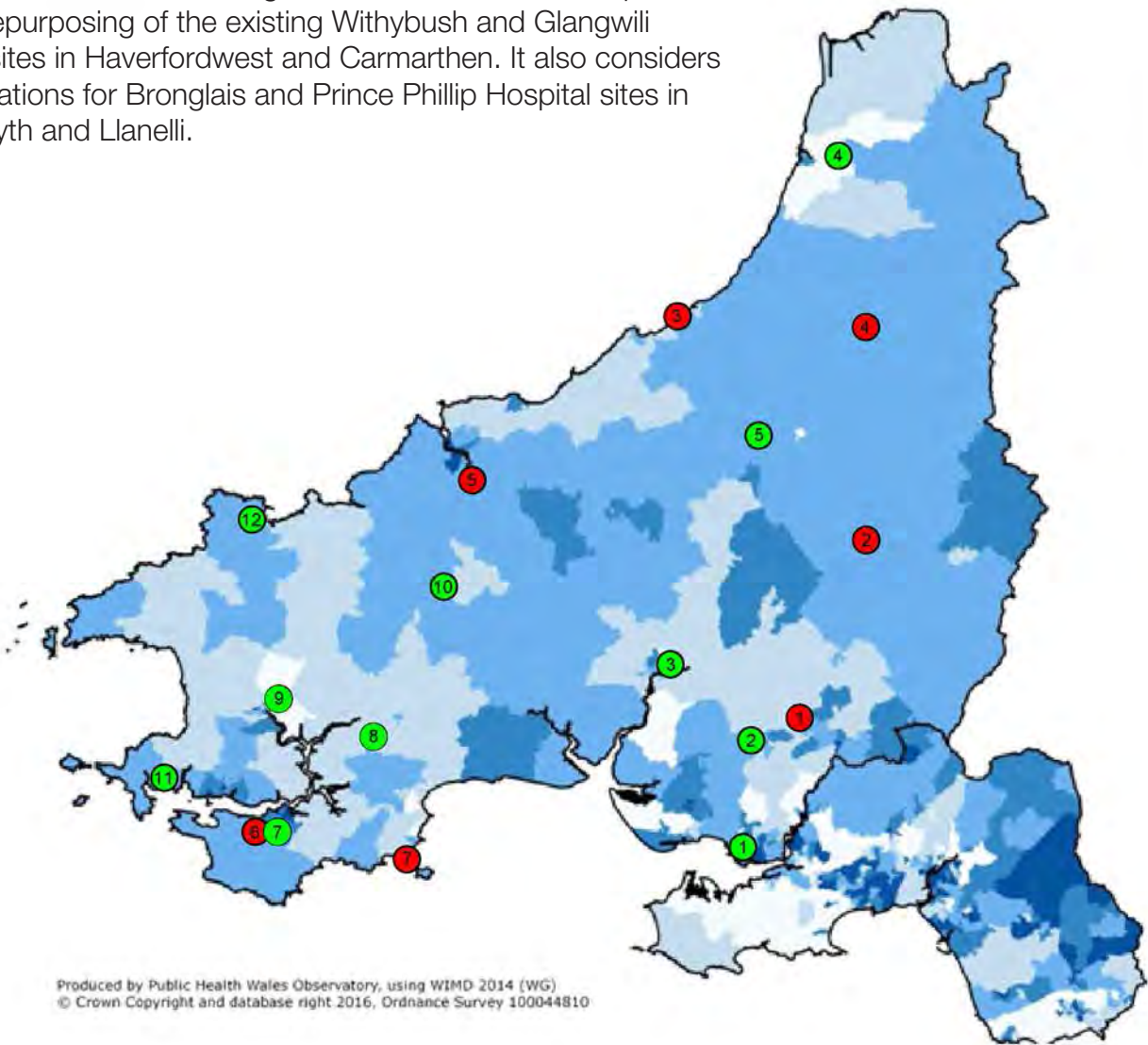
- The two integrated care centres are,
- Aberaeron Integrated Care Centre
 - Cardigan Integrated Care Centre

The Health Board also operates 48 general practices, 49 dental practices (including 3 orthodontic), 98 community pharmacies, 44 general ophthalmic practices (43 providing Eye Health Examination Wales and 34 low vision services), 17 domiciliary only providers and 11 health centres as well as numerous mental health and learning disability facilities.

The estate infrastructure ranges in age from 19th Century to modern day and with varying degrees of functionality, condition and performance. Almost 40% of the estate is over 50 years old and this age profile has implications on backlog maintenance and on the ability to deliver safe, modern healthcare.

The Health Board has developed this Programme Business Case (PBC) to secure the capital funding required to support delivery of their Health & Care Strategy; “A Healthier Mid & West Wales: Our Future Generations Living Well” following the outcome of its previous public consultation exercise in November 2018.

The PBC considers the transformation of the acute hospital estate and the associated implications on the community facilities. It includes provision of a new Urgent and Planned Care Hospital and the repurposing of the existing Withybush and Glangwili Hospital sites in Haverfordwest and Carmarthen. It also considers the implications for Bronglais and Prince Phillip Hospital sites in Aberystwyth and Llanelli.



Carmarthenshire Community Services	
Community Hospitals	
1 Ammanford	Amman Valley Hospital, Folland Road, Glangamman SA18 2BQ
2 Llandovery	Llandovery Cottage Hospital, Llanfair Road, SA20 0LA
Community Health Centres/Clinics	
3 Llanelli	Llwynhendy Health Centre, Llwynhendy Road, Llwynhendy SA14 9BN
4 Llanelli	Elizabeth Williams Clinic, Mill Lane SA15 3SE
5 Cross Hands	Crosshands Health Centre, Carmarthen Road SA14 6SP
6 Carmarthen	Pond St Clinic, Pond Street SA31 1RT

Ceredigion Community Services	
Community Hospitals/Integrated Care Centres	
1 Aberaeron	Aberaeron ICC, Vicarage Hill, SA46 0DY
2 Tregaron	Tregaron Hospital, Dewi Road SY25 6JP
3 Cardigan	Cardigan ICC, Rhodfa'r Fain, SA43 1JX
Community Health Centres/Clinics	
4 Aberystwyth	North Rd Clinic, North Road SY23 2EG
5 Aberystwyth	Padarn Health Center, Penglais Hill SY23 3DU
6 Lampeter	Lampeter Medical Practice, Taliesin Court SA48 7AA

Pembrokeshire Community Services	
Community Hospitals	
1 Pembroke Dock	South Pembrokeshire Hospital, Fort Road SA72 6SY
2 Tenby	New Tenby Cottage Hospital, Gas Lane, The Norton SA70 8AG
Community Health Centres/Clinics	
3 Pembroke Dock	Pembroke Dock Health Centre, Water Street SA72 6DW
4 Narberth	Narberth Health Centre, Northfield Road SA87 7AA
5 Haverfordwest	Haverfordwest Health Centre, Winch Lane SA61 1RN
6 Crymch	Bro Presell Community Resource Centre, Heol Parc Y Ffair SA41 3SJ
7 Milford Haven	Milford Haven Centre, Yorke Street SA72 2LL
8 Milford Haven	Manchester Square Health Center, Manchester Square SA73 2JW
9 Fishguard	Fishguard Health Centre, Ropewalk SA65 9BT

3. Health Board Vision

3.

During the initial consultation phase the HDdUHB identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported;

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision across the three counties. There is also a 10 year gap in healthy life expectancy across the area.

There are huge opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce. The challenges faced means that doing nothing is not an option. The findings from the initial consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.

Safe services

The way in which services are currently organized across the Health Board creates a constraint and is preventing the necessary improvements to ensure that services are working in the best way for patients and their families. Services are also not making the best use of resources - whether this is staff, money, buildings and facilities, or information.

The transformation programme will provide an opportunity for HDdUHB to reorganise the way in which it delivers services to support clinical excellence and to prioritise safe and high quality care. The aim is to address the current variations in service provision and provide high quality evidence-based healthcare, ensuring that patients get the best possible support and treatment at the right time, in the right place.

Sustainable Services

The commitment to provide sustainable services, fit for future generations, includes both sustainable workforce and financial sustainability.

Staff are at the heart of the organisation and getting the right mix of skilled staff to provide services is one of the greatest challenges currently facing the Health Board. The transformation programme provides an opportunity to address staffing shortages which will have a positive impact on the quality of care. A more sustainable workforce will also reduce the demands on permanent staff, who are currently working under high pressure which makes staff retention a particular challenge.

The transformation programme will require staff to adapt to new skills working across the acute and community settings in a seamless healthcare system. This will offer a range of opportunities for staff, including new, extended and expanded roles. Importantly by addressing staffing challenges the HB will be able to release investment required for other services particularly in the community. This will allow the HB to make more sustainable financial decisions with a focus on preventing ill-health in the first instance, and following the principles of Value-Based Healthcare (VBHc). This will help ensure that resources are used most efficiently.

Accessible Services

The rural and remote nature of large parts of HDdUHB impacts patient's ability to access services and often requires them to travel long distances. The aim of the transformation programme is to use innovative solutions based around technology to improve accessibility to healthcare services, and streamline patient flows. This strategy relies on an integrated care system with well-connected primary and community care services, acute care, and social care.

Improved provision of 24/7 community services with timely access to a GP and other primary care services where required, should reduce the incidence of inappropriate hospital admissions. This also supports the ambition of allowing more people to stay in their own home or have their care provided as close to their home as possible. It will reduce the number of hospital admissions therefore easing the pressure on emergency care and allowing the HB to minimize the number of delayed or cancelled operations and procedures, reducing stress for the affected patients and optimizing the use of scarce resources.

Kind Services

Addressing the challenges noted above provides an opportunity to deliver far kinder services to the population of mid and west Wales. Key to this will be excellent customer service, based on listening to patient experience and making improvements where needed to deliver the most compassionate care possible. There is also a need to look after and value every contribution made by doctors, nurses, therapists, healthcare professionals and all support staff.

Keeping people away from health services in the first place is one of the kindest things HDdUHB can do, and there is a need to focus on helping the public avoid illness and anticipate when conditions are likely to deteriorate. This will also have the benefit of reducing pressure on health services, so that those who really need to access them have the best and kindest experience. This focus on population health and prevention necessitates much closer working with other organisations, such as social care and the voluntary sector, to both keep people at home and also to reduce delays in leaving hospital so that hospital beds are only used when they are needed or where people need the attention of a specialist.

4. Existing Estate

4.1 Introduction

The existing Hywel Dda University Health Board estate covers around 52 hectares across the counties of Carmarthenshire, Ceredigion and Pembrokeshire and with a catchment area of around 5,800sqkm it is the largest Health Board by area in Wales. The total gross internal floor area of the estate as listed in the latest Data Report is 189,613sqm.

The Health Board owns 57 separate sites with buildings which range in age from 19th Century to modern day and with varying degrees of functional suitability, statutory compliance, physical condition and environmental performance. Almost 40% of the estate is over 50 years old and the age profile of the estate, combined with the large number of small to medium properties which are required to support a dispersed population across a wide area, has significant implications on backlog maintenance and on the ability to deliver safe, modern healthcare.

This chapter includes a summary of the overall estate condition which references the latest Estate and Facilities Performance Breakdown report (2019/2020), Backlog maintenance reports for the acute sites dated 31.03.2021, the Business Continuity (Major Infrastructure) Programme Business Case and previous estate condition reports.

The estates performance is measured against the All Wales average on a number of key performance indicators. Overall, the Health Board is closely aligned to the All Wales average position, although with key challenges with energy performance and safety.

Financially, cleaning, catering and energy management represent the most significant revenue expenditure items for the estate. The overall facilities average running cost across the estate is £173/sqm although costs per individual location vary significantly with some of the smaller facilities such as Amman Valley, Llandovery and Tregaron community hospitals having significantly higher operating costs than the acute facilities.

Further detailed information on specific estate challenges is included in the following chapters which reference the four acute sites and community hospital sites.

Age Profile of the estate

As noted above, almost 40% of the overall acute and community hospital estate is over 50 years old. All of the major acute sites were built between 1960 and 1990 and this is reflected in the diagram opposite. Only a small number of community facilities pre-date the establishment of the NHS in 1948. Tregaron and Llandovery cottage hospitals both date from the 19th century and this is reflected in their relatively poor performance.

14% of the estate has been built within the last 15 years and this is mainly accounted for by the new integrated care centres at Aberaeron and Cardigan and by investment in new facilities at Withybush (Emergency/Urgent Care and Renal) and Glangwili (Renal, Women’s and Children’s and Mortuary).



HDdUHB Estate Age Profile Diagram



Backlog Maintenance Summary

The age profile of the various buildings has a significant impact on the overall backlog maintenance costs across the estate. The current estimated backlog maintenance cost across the four acute sites is £62,937,297.81- (based in backlog report from April 2021). Of this over £40m is classified as ‘significant risk’ and almost £15m as ‘moderate risk’.

Most of the £62m relates to risks associated with physical condition and compliance with fire safety legislation with the largest proportion of this spread across the Glangwili (£30m) and Withybush (£19m) sites.

Across the community estate the risk adjusted backlog maintenance figure is around £5.6m (taken from 2020/21 EFPMS data report). A significant proportion of this figure (£1.8m) relates to Tregaron Community Hospital while a further £1.5m is split between Hafan Derwen MHU, Bro Cerwyn MHU and St Brynnach day hospital.

These figures describe the cost of dealing with key backlog maintenance issues in order to upgrade facilities to estate condition B when compared with current performance and are not to be confused with the figures included in the Business Continuity PBC which identifies the cost of maintaining and de-risking clinical services on the acute sites in the short to medium term only.

Physical Condition

According to the latest Estate and Facilities Performance Breakdown most of the acute and community sites have a significant proportion of areas (90% +) which fall within estate code categories B-F and are in reasonable condition. The notable exceptions are the Amman Valley Hospital (85%), Glangwili Hospital (84%) and Withybush Hospital (86%). Overall the estate achieves a performance target of 87% compliance against physical condition indicators.

Tregaron community Hospital reports a figure of only 52% compliance with known issues relating to water ingress, heating infrastructure and controls and building fabric. The building is scheduled for replacement with a new Integrated Care Centre within the next few years.

Bronglais Hospital, Llandovery Hospital, and Hafan Derwyn are all recording 90% compliance and will need to be carefully monitored over the coming years to avoid falling into the lower ‘amber’ category. Further detail on the specific physical condition issues on each of the sites are included in the following sections of this chapter.

Statutory Health & Safety Compliance

The existing estate is regularly assessed for compliance with statutory guidance including health & safety at work, control of legionella and control of substances hazardous to health.

The latest performance breakdown report highlights that most of the acute and community sites have a significant proportion of areas (90% +) which fall within estate code categories B-F and are in reasonable condition. Exceptions are the Amman Valley Hospital (83%), Bronglais Hospital (87%) and Glangwili Hospital (82%). The average across the estate is 89% compliance which is slightly below the 90% target.

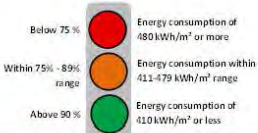
Tregaron community Hospital reports a figure of 48% compliance which reflects the age of the facility and associated infrastructure.

Further details relating to statutory compliance for each of the sites are included in the following chapters.

Key Performance Indicators

Percentage of the estate which is of reasonable standard (falls within Estatecode category 'B/F')

Site Name	Physical Condition (%)	Statutory Health and Safety compliance (%)	Fire Safety compliance (%)	Functionally suitable (%)	Space utilisation (%)	Net Energy Consumption (kWh/m²)	CO ₂ Emissions * (kg/m²)
ABERAERON INTEGRATED CARE CENTRE	100	100	100	100	100	192	43
AGGREGATED SITES	86	91	93	92	97	186	41
AMMAN VALLEY HOSPITAL	85	83	85	75	97	520	112
BRO CERWYN & ST BRYNACH DAY HOSPITALS	94	82	95	95	97	284	67
BRONGLAIS GENERAL HOSPITAL	90	87	91	94	100	478	108
CARDIGAN INTEGRATED CARE CENTRE	100	100	100	100	100	167	40
GLANGWILI GENERAL HOSPITAL	84	82	96	86	100	550	144
HAFAN DERWEN (ST DAVID'S HOSPITAL)	90	97	97	100	95	311	67
LLANDOVERY HOSPITAL	90	93	93	88	98	508	102
PRINCE PHILIP HOSPITAL	95	93	96	95	100	493	118
SOUTH PEMBROKESHIRE HOSPITAL	94	96	92	93	97	281	63
TENBY HOSPITAL	95	100	99	100	98	263	58
TREGARON HOSPITAL	52	48	80	38	60	563	150
WITHYBUSH GENERAL HOSPITAL	86	94	91	93	99	422	97
Health Board Average	88	89	94	91	99	461	111



HDdUHB Estate Key Performance Indicators from Estates and Facilities Performance Breakdown Report 2020

*Target to be agreed

4. Existing Estate

Fire Safety Compliance

Generally the health board estate is shown to be 93% compliant with current fire safety guidance.

The latest EFP breakdown highlights Amman Valley (85%) and Tregaron (80%) community Hospitals as being of specific concern in relation to fire safety performance.

Alongside the general performance indicators in the EFP breakdown both Withybush and Glangwili hospitals are subject to separate enforcement notices from Mid & West Wales Fire & Rescue Services. The notices include recommendation to replace fire doors, improve compartmentation integrity and replacing fire alarm systems and dampers.

The Health Board is currently developing separate business cases to support the upgrading of the fire performance on each site outside of the current Programme Business Case.

Functional Suitability

An assessment of functional suitability identifies how effectively a room, department, building or site supports the delivery of the existing clinical service. The aim being for each space to be functionally appropriate to the current and known future demand. It is important to note that the functional suitability of a department/ building is not necessarily dependent on the quality of the space, but it will have an impact on both service delivery and the quality of the patient experience.

Across the HDdUHB estate a wide range of existing clinical areas are deemed to be not functionally suitable when compared to current healthcare design guidance. Although the majority of the existing sites are within the category of 90% + compliance, Glangwili is shown to be only 86% compliant, Amman Valley 75%, Llandovery 68% and Tregaron only 38% compliant with modern healthcare space standards.

There are significant issues associated with upgrading these areas to meet current standard including service disruption and a potential reduction in capacity of existing buildings in order to meet current area standards.

It is also important to note that the functional suitability of the existing estate has been assessed against current service model. Once the new service model has been agreed in response to the Transforming our Clinical Services programme we may see an increase in noncompliance across the estate because of the need to adapt to new models of care.

Space Utilisation

Space utilisation across the estate is high at over 99% average utilisation and with most of the acute and community properties achieving over 97% utilisation. The only exception being Tregaron hospital which only achieves 60% utilisation, mainly as a result of the poor physical condition of the historic building which prevents certain areas being fully occupied.

A specific issue which has been highlighted relating to space utilisation across the estate is office accommodation with a number of properties identified as having a low space utilisation factor for office areas. There are opportunities to address this through the implementation of agile working strategies across the estate which may help free up space to improve standards in clinical areas.

In response to the Covid pandemic in 2020, NHS Wales Employers in collaboration with health board workforce directors published a strategy for future agile working across the NHS estate in Wales. This publication explores the benefits of agile working including the opportunity to improve space utilisation factors across the estate.

This will be a key document to support decisions relating to space requirements for new build and repurposed facilities moving forward through future stages of design.

Energy Cost and CO2 Emissions.

The EFP breakdown report assess each of the acute and community properties against a number of factors including net energy consumption kWh/sqm, CO2 emissions and energy costs. The age profile, physical condition, statutory compliance and functional suitability of each facility has a big impact on the energy performance. Newer facilities such as the Aberaeron and Cardigan Integrated Care Centres both have a net energy consumption of under 200kWh/sqm, average energy costs of £13/sqm and carbon emissions of around 40kg/sqm. Some of this can be attributed to modern services installations and construction standards and some to the fact that these buildings are not occupied 24/7.

As expected the performance of the four acute sites is significantly lower. Withybush Hospital performs the best of the acute sites with a net energy consumption of 422kWh/sqm, energy costs of £22/sqm and carbon emissions of around 97kg/sqm. Bronglais has a net energy consumption of 478kWh/sqm, energy costs of £30/sqm and carbon emissions of around 108kg/sqm. Prince Philip Hospital, the newest of the acute sites has a net energy consumption of 493kWh/sqm, energy costs of £26/sqm and carbon emissions of around 118kg/sqm.

Glangwili Hospital is the worst performing of the four large sites with a net energy consumption of 550kWh/sqm, energy costs of £40/sqm and carbon emissions of around 144kg/sqm.

Of the community sites Amman Valley, Llandoverly and Tregaron all have a net energy consumption of over 500kWh/sqm, Carbon emissions of over 100kg/sqm (Tregaron Hospital has emissions of 150kg/sqm) and energy costs of between £34 and £42/sqm.

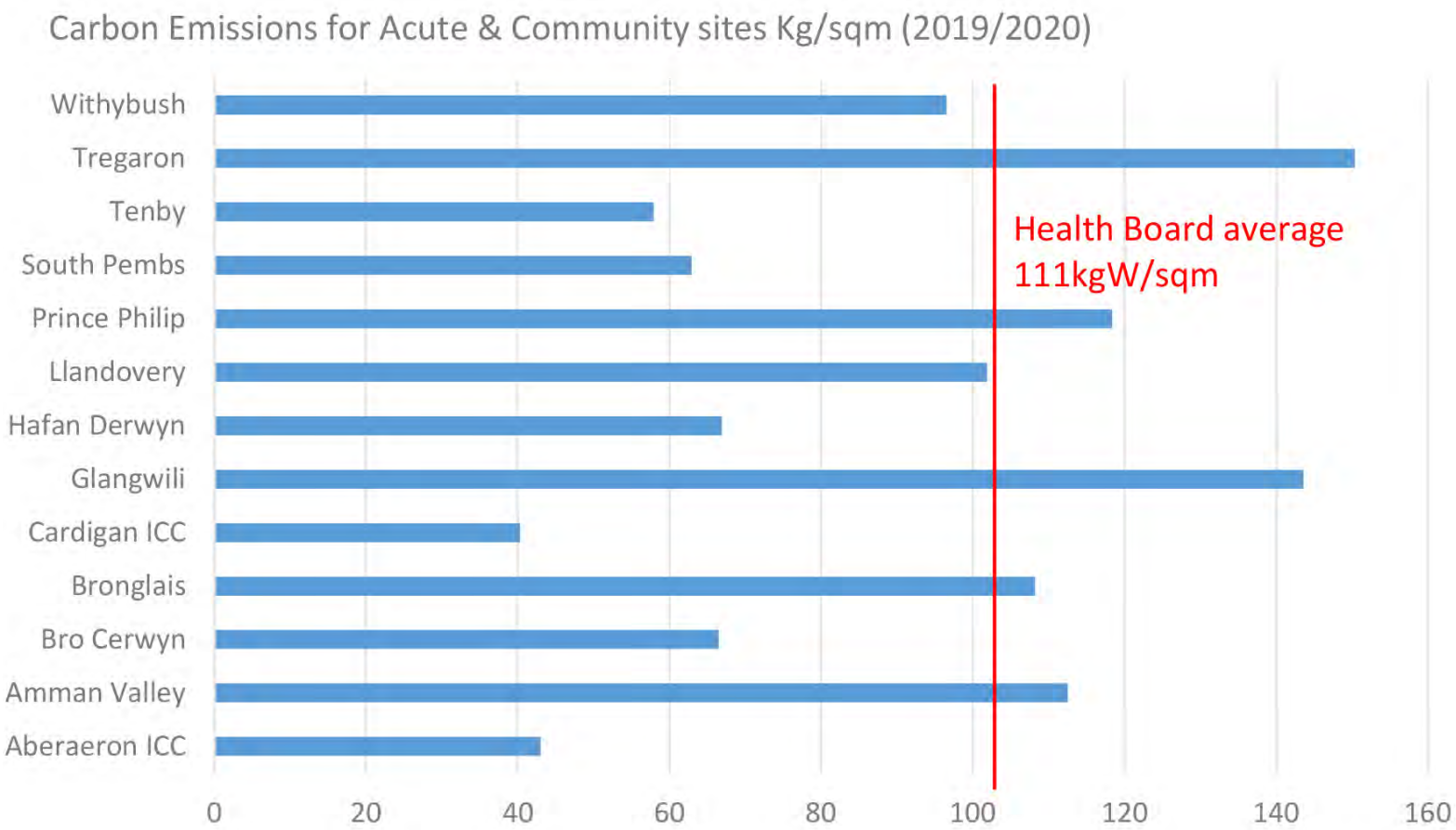
The average performance across the Health Board estate indicates a net energy consumption of 460kWh/sqm, carbon emissions of 110kg/sqm and energy costs of £29/sqm. All of these figures show a trend for a worsening performance over time with carbon emissions increasing by 5% since the previous assessment and energy costs increasing by over 11%. Some of this increase in energy will be due to market factors but it must be considered a significant risk for the future estate.

NHS Wales Shared Services Partnership has set targets for reducing carbon emissions across the health care estate via the ‘NHS Wales Decarbonisation Strategic Delivery Plan 2021-2030’ including a general reduction against 2019 carbon emissions of circa 34% by 2030. Included within this target is an aspiration to reduce the carbon emissions generated by buildings by 45% during the same period. For HDdUHB this will mean bringing the health board estate average down from 111kg/sqm to around 60kg/sqm by 2030. However working on the assumption that much of the estate will be replaced or re-purposed as part of this programme of works then a more ambitious target could be achievable.

Business Continuity PBC

In parallel with this Programme Business Case a separate PBC has been developed to identify the level of estates infrastructure works needed to sustain the four acute hospital sites and eliminate the risk to service delivery. The BC PBC focuses on urgent work at Glangwili and Withybush required to maintain the viability of both sites for the short to medium term future (7-10 years). For Prince Philip and Bronglais, the PBC assumes a longer term commitment to deliver clinical services from the existing buildings.

The Welsh Government have acknowledged the need for urgent investment across the estate and some interim capital funding has been included in the All Wales Capital Programme such as the fire safety upgrade works at Withybush and Glangwili noted above.



Comparison of carbon emissions for acute and community sites

4. Existing Estate

4.2 Bronglais Hospital

Bronglais Hospital is located in Aberystwyth at the northern end of the HDdUHB catchment area. It is the only acute hospital within mid-Wales and is the main hospital for the students of Aberystwyth University.

The hospital site occupies approximately 4 hectares and is steeply sloping with a fall of circa 24m from east to west and roughly 3m from north to south. The site is bounded to the north by the busy Penglais road, to the south and West by low rise residential areas. To the East lies the main campus for Aberystwyth University and the National Library of Wales.

In addition to Accident & Emergency, Day surgery and main operating Theatre services, along with clinical support services such as Pathology, Sterile services, key clinical services such as diagnostic imaging, Planned & unplanned care, ambulatory care, paediatrics and maternity are also provided at Bronglais Hospital. The inpatient beds covering a wide range of specialities such as general surgery, ITU, CDU, respiratory, cardiology, Gynae, Maternity, Acute medicine, oncology, orthopaedics & paediatrics.

The main hospital buildings were constructed in the 1960s with the 1st phase completed in 1966 including a A&E department, operating theatres and 100 beds. According to the 2021 EFPMS date the hospital currently has a gross internal area of 27,531sqm, provides a circa 155 inpatient beds & 10 mental health beds, providing a comprehensive range of inpatient & outpatient services, and a 24 hour Emergency & Urgent Care centre, as well as mental health services.

The main building blocks include Day surgery block 15 which was constructed in 2007, medical block 1 & surgical block 2 originally built in 1960's. Buildings range in height from 4-6 storeys but due to the steep topography across the site there are 10 levels across the estate. There are a number of ancillary buildings on site range in age from 1950s to modern day, including Postgraduate and residential block to the south east of the main buildings, a mental health block 3, and a number of Victorian houses which are used as offices.

The physical condition of the buildings vary due to the age of the construction. 36% of the overall HDdUHB estate is over 50 years old but at Bronglais this percentage is nearer 62%. The facades of the original buildings are a mix of exposed concrete frame, insulated render cladding and brickwork with powder coated aluminium windows with evidence of corrosion in the framework, much is towards the end of its life with issues around water ingress, fire safety corrosion. Remedial works are required to large part of the external facade.

The hospital buildings generally have flat roofs. Whilst the flat roof over surgical block 2 was replaced during the recent upgrade works, the roof over medical block 1 and some of the low level area also require similar replacement. The overall the structural frame and floor structures of the clinical accommodation are operationally sound, though minor repairs are required.

Over the last 10 years a comprehensive redevelopment strategy has been undertaken including the construction of a new front of house a new Emergency unit, Clinical Decision Unit and a dedicated Day surgery, as well as refurbishment of Pathology, Maternity and the main operating Theatres. A new evacuation lift has also been installed on the southern side of surgical block 2 to serve the main operating theatres located on 7th floor.

Access to / from the hospital are reasonably good. With the Emergency Department located at the western end of the main building and site level change, there are two separate entrances, one provides access to emergency department and the lower car-park level, the other offers access to the newer front of house and upper car-park. A third junction provides access to the mental health block 3 and short stay ward. The 'blue light' access route to the Emergency Department is provided to and from Penglais Road. A turning head outside the Emergency department enables emergency access only against the anti-clockwise one-way flow of general traffic on the hospital ring road.

There is a designated one-way service route which connects to the main hospital street with a designated goods parking area. Adjacent to the deck car-park are general pick-up and drop-off points from the bus services on Penglais road.



Site Plan - Figure ground



Aerial view of Bronglais Hospital (Google Maps)

4. Existing Estate

4.

Access within the hospital main blocks to specific departments are via various entry points around the perimeter of the buildings; The main entrance between block 1 & 2 connecting the main hospital street is accessed from the south boundary facing Caradog Road, together with corridors and vertical circulation cores branched out from the street, it provides a network of circulation across all departments.

Internally, the original partition walls are of masonry construction with plastered finishes and painted decoration, otherwise partitions are of lightweight construction with plasterboard linings fixed to a timber or metal framework. There are demountable, part glazed, metal framed partitions to ward bedrooms.

Generally buildings constructed or refurbished within the last 10 years are in good condition internally and categorised as A/B, the rest is in poorer condition and categorised as C.

Due to the age of the buildings, many components present risks for safe use and are in need of replacing or upgrading. Internal spaces & environment are also no longer suited to the delivery of safe and modern healthcare. Many of the rooms are undersized compared to current HBN guidances; the ward configuration is poor with multi-bed rooms such as 3 bedded room and 6 bedded room being no longer supported by the current healthcare standard. The proportion of single rooms is significantly below the minimum recommended; there are also a general lack of patient day room facilities and sanitary facilities especially en-suite provision.

Compliance with the Disability Discrimination Act is also poor, demonstrated by inadequate corridor widths and door sizes. All of these non-compliances reduce flexibility and quality of the clinical services, impact privacy & dignity, increases infection risk and make safe manual handling more difficult to achieve.

There are also known statutory compliance issues with the hospital including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. A number of key issues identified from a recent engineering system review, including the need to update electrical infrastructure, nurse call and bed head services in the original buildings. It is understood that Building Management Controls and external lighting were also identified as needing further investment.

In terms of mechanical infrastructure which dates from the original build, some of the distribution has been replaced over the life of the hospital but the majority of these replacements have been local, linked to specific issues and primary routes. Despite maintenance and repair, much of mechanical services infrastructure has now reached the end of its service life, including a number of major plant items such as LTHW boilers, chiller plant and a number of AHUs. Some further fire safety improvements are required to some building blocks including repairs to compartmentation, fire doors and improved emergency lighting. It is also understood that the heating infrastructure is nearing end of life and may require replacement.

There are great opportunities for new engineering services plant and infrastructure, along with upgrades to the building fabrics, it would not only help deliver modern safe clinical services but also help support a move towards net zero carbon.

As part of a wider site future redevelopment strategy there would be an opportunity to build new, demolish or re-develop some of the peripheral buildings around the site. These developments could help address the above highlighted issues, expand the current clinical services in modern fit-for-purpose accommodation whilst enhancing the character of the site, creating landscape areas to enhance the wellbeing of patients and staff and improve staff retention.

For more details of the existing Bronglais hospital especially MEPCS please refer to section 2 in Appendix A.



Bronglais Hospital from Caradog Road



Bronglais Hospital from Caradog Road

4. Existing Estate

4.3 Glangwili Hospital

Glangwili General Hospital is located in the town of Carmarthen, about 2km to the north of Carmarthen town centre between the areas of Glangwili and Abergwili, adjacent to Dolgwili Road and close to the new A40 town by-pass link road which connects Carmarthen to Llandovery and Aberystwyth to the north of the Health Board area. The site occupies approximately 11.31 hectares and is relatively flat with only a slight fall from West to East. It is bounded to the east by a heavily wooded area adjacent to the A40 and Gwili Heritage Railway line, to the west by a ‘green corridor’ containing a public footpath and cycleway connecting the Hospital to Carmarthen Town Centre; and by low rise residential areas to the north west and south.

The first hospital in the town was the Carmarthen Infirmary built in 1858 on Priory Street in the Town Centre. The building became part of the NHS in 1948 and remained in use until the late 20th Century. During the second world war the US military established a hospital and Prisoner of War camp close to Abergwili and following the establishment of the NHS the buildings and infrastructure were repurposed as the ‘West Wales General Hospital’ in 1949.

The new West Wales General Hospital was built in the early 1960’s to designs by Percy Thomas. The latest data shows that the current hospital has a gross internal area of 51,294sqm and key clinical functions include 383 inpatient beds, an Emergency and Urgent Care Centre, diagnostic imaging, operating theatres and critical care, outpatients and a Renal Dialysis Unit. The inpatient services covers a wide range of specialities such as Gynae & Obstetrics, General Surgery, Paediatrics, ITU, General Medicine, Trauma, CCU and many more.

Site access is via Dolgwili Road to the west. With the Emergency Department being located at the south of the main hospital building. The ‘blue light’ access route to the ground floor ED is provided off Bronwydd Road separate from the main entrance route for the public. A turning head and ambulance parking area outside the ED accommodates emergency vehicles only with dedicated parking adjacent for patients and visitors. General staff and public traffic flows through a single roundabout outside the main entrance, whilst FM access is also provided from the same peripheral site road as for blue light traffic with designated FM deliveries and parking area is provided adjacent to the estates yard situated on the western boundary of the site.

The main public car park is adjacent to the site entrance with further parking areas around the site; the current Estate Data Report suggests that there is a total of 1,323 parking spaces available including 32 accessible parking spaces and 971 staff parking spaces. There is also a Park & Ride service available between the hospital and the Carmarthen showground car park.

There are various access points around the perimeter of Glangwili Hospital which enable access into each block or specific department. The main entrance concourse however is accessed from the North facing the main public car parking. Entrance via the concourse will lead you to the hospital street where individual corridors and vertical circulation cores connect the individual departments across the various site levels.

The main hospital building is clad in concrete panels with strip UPVC windows and a pitched concrete tile roof which was added in the 1990’s to address water ingress issues with the original flat roof. The staff residences are generally brick with UPVC windows and detailing. Newer extensions to the main building consist of terracotta cladding, brickwork and render with aluminium windows and detailing.



Site Plan - Figure Ground



4. Existing Estate

4.

Due to the time of construction the buildings are in various conditions and with varying degrees of functionality and performance. With exception of those built within the last 20 years which are considered to be in good condition and categorised A/B i.e Urgent Care and renal etc, over 63% of the buildings on site aged 50-60 years old are in poor condition and categorised C; Most of these are part of the original hospital include inpatient ward blocks, operating theatres, outpatients, radiology and pathology services. Some part of the building facades and roofs have received some remedial work, but most are at the end of their service life and require comprehensive repair, refurbishment and replacement.

The internal spaces and layout are also reflective of the timing of the construction in the early 1960's and much of the internal layouts in the original buildings are no longer suitable for the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity, increases infection risk and makes safe manual handling more difficult to achieve. Many of the patient beds are arranged in 4 bed bays which are significantly below current space standards and the proportion of single rooms (20%), falls below current recommended standards. Very few bedrooms are equipped with en-suite facilities. Staff facilities are also known to be below standard with reports of insufficient support spaces such as staff rooms, toilets, changing facilities and office accommodation.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update electrical infrastructure, nurse call and bed head services and heating infrastructure. A number of major plant items were also identified as being 'end of life' including Combined Heat & Power plant, LTHW boilers, control panels, pressurisation tanks, calorifiers, Vacuum pumps, Oil storage tanks, chiller plant and a number of AHUs. It is also understood that the water mains infrastructure is nearing end of life and may require replacement. New engineering services plant and infrastructure will help move towards net zero carbon with new or upgraded building fabric incorporating low carbon technologies.

There are also known statutory compliance issues with the hospital including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. The most significant statutory compliance issue relates to fire safety and an enforcement notice was issued by Mid and West Wales Fire and Rescue Authority in 2019.

The physical conditions of the buildings on Glangwili site has implications on backlog maintenance and on the ability to deliver safe and sustainable healthcare. The backlog maintenance cost for the site is significant and a wide range of areas do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience.

There are many significant estates constraints on the site such as limited area for future expansion, low density buildings, pressure on car parking spaces and the increase ratio of non-clinical to clinical accommodation; the most challenging constraints in terms of the site development is that the majority of buildings ranked as condition C are embedded at the core of the site surrounded by more modern extensions which are generally condition category A/B. Investment is required to remove significant infrastructure risks such as the following key risks identified on the latest backlog maintenance schedule (March 2021).

As part of a wider site future redevelopment strategy there would be an opportunity to build new, demolish or re-develop some of the peripheral buildings around the site. These developments could help address the above highlighted issues, expand the current clinical services in modern fit-for-purpose accommodation whilst enhancing the character of the site, creating landscape areas to enhance the wellbeing of patients and staff and improve staff retention.

For more details of the existing hospital esp. the existing M&E service information please refer to section 2 in Appendix B.



Glangwili Hospital Entrance



Glangwili Hospital external Facade

4. Existing Estate

4.4 Prince Philip Hospital

Prince Philip Hospital is located in the village of Dafen, approximately 2km to the north east of Llanelli town centre on the B4303 adjacent to Bryngwyn School. The site occupies approximately 12.48 hectares. The central and eastern areas of the site are relatively flat however the topography rises steeply along the western side with a level difference of over 15m. The site is bounded on all sides by mature trees with low rise residential areas to the west and south, and a small industrial zone and agricultural land to the East. The access point to the site is from the B4303 to the north which connects to a ring road around the hospital building providing access to staff & visitor parking to the North east. FM and estates areas are to the south of the main hospital, and to the west are a number residential accommodation some of which have been converted into office accommodation.

Prince Philip Hospital was designed by Holder Mathias Architects, constructed in the late 1980's and officially opened in 1990. The design was based on a standard 'hospital nucleus' template, with courtyards, linked by a ling central hospital street which allows the hospital to be easily extended. The standardised hospital planning approach sought to achieve reduced cost and greater efficiency.

Buildings on the site are generally in good condition. The main hospital buildings are all two storey pitched roof construction with plant in the roof space and some areas of increased height along the central hospital spine. The residential blocks to the west are generally 3 storeys but overlook the main building as a result of being located on a raised bank. The main building is constructed with brickwork facades and a pitched concrete tile roof and with powder coated metal detailing. Ancillary buildings are generally of similar construction to the main building although only one or two storeys, apart from the Bryngofal mental health unit which is single storey brickwork and insulated metal cladding and a curved metal roof construction.

The hospital provides inpatient services, surgical day case theatres, endoscopic suite, Radiology and Laboratory support and palliative care facilities, including a new hospice facility. It also provides for a range of specialist outpatient clinics including Haematology, Respiratory and Gastroenterology.

When Prince Philip hospital was first opened in 1990 it had only 200 beds, an accident and emergency department, diagnostic and therapeutic facilities with staff residences and pharmacy labs. The latest data shows that the current hospital has a gross internal area of 29,297sqm and has 216 inpatient beds across seven inpatient wards and an admission ward, and 42 mental health beds. In addition to the afore mentioned clinical functions, a new Elderly Mental Infirm Unit and a new Adult Mental Health Services unit was built in 2000's, as well as a new breast care unit was opened at the hospital In 2010 followed by a rehabilitation unit in 2013 and a reconfigured minor injuries unit in 2016. Inpatient beds cover a wide range of the specialities including General Medicine, Trauma & Orthopaedics, Rehabilitation, General Surgery and Stroke.

Vehicular access to the hospital site is via a single junction to the north of the hospital; it connects a ring road running around the main building which is part two-way and part one-way. The main entrance and minor injuries unit face the site entrance to the north with the rehab unit entrance further to the East. Entrance to the Acute Medical Assessment Unit is at the south of the hospital with separate entrances on the west to the FM stores and boiler house. Visitor and staff parking is spread across the site with the main public car park located adjacent to the site entrance. The current Data Report suggests that there is a total of 705 parking spaces available on the site, of which 28 spaces are designated disabled parking spaces and 455 are dedicated for staff.

The Minor Injuries Unit is located adjacent to the main entrance, with the 'blue light' access route to the ground floor Minor Injuries Unit follows the same route as all other site traffic. There is a dedicated ambulance drop-off and parking zone outside the MIU entrance. FM access is via the hospital ring road the main estates building located to the west of the site and connected to the main hospital. A designated goods delivery area and turning head are provided within this zone area to prevent disruption of the one-way flow traffic. There is a public bus stop at the northern end of the site adjacent to the B4303. Currently there is no cycle route or hub on the site.



Site Plan - Figure Ground



Aerial view of Prince Philip Hospital (Google Maps)

4. Existing Estate

4.

The main hospital building has a steel frame and in-situ concrete floors, facing brick works cavity external walls with flat metal cladding panels between first floor windows, and a concrete tiled pitched roof. Windows are generally aluminium framed with single

glazing. The new Elderly Mental Health Unit is of similar construction and appearance to the main hospital, but has a profiled metal sheet roof. The Adult Mental Health Services Unit has a steel frame, facing brick work cavity walls at ground floor level with composite insulated metal panel cladding above, and a curved profiled metal sheet roof. And the new Breast Care Unit at the rear of the main entrance block is also of similar construction to the main hospital with the exception of two small extensions which have composite insulated metal panel cladding and flat roofs.

The hospital buildings are with varying degrees of functionality, condition and performance. Generally the buildings are in good condition; building fabric, internal fixtures and fittings, decoration and finishes are mostly physically sound, with minor repairs required, except some area of finishes reaching end of their use require would benefit from cosmetic redecoration. Other elements of the building such as flat roofs are reaching the end of their serviceable life; the coating on the metal cladding panels is starting to deteriorate leading to corrosion of the panels, and require major repair or replacement.

Despite the relatively modern construction many of the internal spaces do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience. Internal spaces and layout are reflective of the timing of the design and construction and although relatively modern when compared to the rest of the acute estate many of the clinical departments require upgrades to support the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity, increases infection risk and makes safe manual handling more difficult to achieve. Also many of the patient beds are arranged in 6 bed bays which are no longer recommended in the current standard and the proportion of single rooms (14%), falls well below the recommended minimum percentage.

Very few bedrooms are equipped with en-suite facilities. Staff facilities are also known to be below standard with insufficient support spaces i.e. staff rooms, toilets, changing facilities and office accommodation.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update the nurse infrastructure. A number of major plant items were also identified as being 'end of life' including LTHW boilers, steam boilers, control panels, main water storage tanks and a number of AHUs.

There are good opportunities for new engineering services plant and infrastructure, along with upgrades to the building fabrics, it would not only help deliver modern safe clinical services but also help support a move towards net zero carbon and increase energy performance.

There are also a number of statutory compliance issues which need to be addressed including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. The fire escape strategy is considered to be acceptable due to the building being based on the nucleus design which allows for progressive horizontal evacuation.

As part of a wider site future redevelopment strategy there would be a number of potential development sites around the perimeter of the existing ring road although any new buildings will need to consider the displacement of car parking on the site. The site has a reasonable amount of landscape amenity although there may be an opportunity to introduce a walking route in the landscape for staff, patients and visitors which would enhance the character of the site, improving wellbeing and staff retention.

For more detailed description of the existing Prince Philip hospital especially the existing M&E service information please refer to section 2 of Appendix C.



Prince Philip 1992 (Holder Mathias)



Prince Philip Hospital Main Entrance

4. Existing Estate

4.5 Withybush Hospital

Withybush General Hospital is located to the north of Haverfordwest town centre, along Fishguard Road and close to the A40 link road which connects Carmarthen and the M4 to the port of Fishguard. The site occupies approximately 8.31 hectares and is relatively flat sitting on a high level escarpment which falls away to the west down to the Western Cleddau River. The site is bounded to the north and south by out-of-town retail centres and to the east on the opposite side of Fishguard Road by low rise residential areas. To the west the site is bounded by a line of mature trees and a steep slope down towards the Western Cleddau River. The remainder of the site is characterized by low landscape planting and extensive car-parking.

Haverfordwest was originally served by the Pembrokeshire and Haverfordwest Infirmary (1859) located adjacent to St Thomas' Green in the centre of the town. The hospital was renamed 'County Hospital' in 1919 and prior to the Second World War expanded to include the adjacent workhouse. During the Second World War a military hospital was established in the Prendergast area of the town made up of series of Nissen huts. This hospital later became known as 'Withybush Hospital' and following the approval to build a new general hospital in the town in the early 1970's was cleared as a site for the new development although the original name was retained.

The new Withybush Hospital was based on a cruciform template design, built between 1973 and 1978 at a cost of £7m, and officially opened in 1979. There are two main groups of buildings on the site; the original three story hospital building from the 1970's which has been extended a number of times including most recently a renal unit adjacent to the front entrance, and a group of staff residences to the north east of the site which were part of the original construction.

At the time when it first opened, it included 314 beds and a 24/7 accident and emergency department. The latest Estates and Facilities Performance Management (EFPMS) data confirms that the current hospital has an overall gross internal floor area as 39,477sqm; key clinical functions include 213 inpatient beds, an Emergency and Urgent Care Centre, diagnostic imaging including MRI, operating theatres, outpatients and a Renal Dialysis Unit built in 2014. The Inpatient services cover a wide range of specialities including general medicine, trauma & Orthopaedics, midwifery, Haematology, Gynae, stroke and stroke rehab and general surgery.

Access to the hospital site is via two separate junctions onto Fishguard Road to the East of the hospital site. Within the site a ring road runs around the main building which is part two-way and part one-way. The Emergency Department is located to the north of the main entrance at the front of the hospital; The 'blue light' access route to the ground floor Minor Injuries Unit follows the same route as all other site traffic. There is a dedicated ambulance drop-off and parking zone outside the MIU entrance.

Visitor and staff parking is spread across the site with the main public car park located adjacent to the site entrance. All parking is on-grade. The current Data Report suggests that there is a total of 1,093 parking spaces available on the site, of which 41 spaces are designated disabled parking spaces and 733 are dedicated for staff.

FM access is via a separate access road from the retail area to the south and then the hospital ring road. There are public bus stops to the east of the site adjacent to Fishguard Road but no services come onto the hospital site. There is also a cycle route running alongside Fishguard Road but there is no direct connection into the hospital site.

There are various access points into the hospital building around the perimeter however the main entrance concourse is accessed from the East facing the main vehicular site entrance and bus stops, and leads to the hospital street from which individual corridors and vertical circulation cores lead into the individual departments across the various site levels.

The hospital has a pre-cast concrete frame and floor structure, with precast concrete wall panel cladding and ribbon windows. The main hospital building is clad in concrete panels with strip windows which are generally UPVC. It has a pitched concrete tile roof which was added in the 1990's to address water ingress issues with the original flat roof. External fabric of the main building is generally in a poor condition, i.e. the concrete façade is reported having water ingress in multiple locations. The majority of the external windows were replaced within the last 15 years but are now also suffering with water ingress. There is also known to be asbestos in some areas of the façade.



Site Plan - Figure Ground



4. Existing Estate

The staff residences are generally brick with UPVC windows and detailing. Newer extensions to the main building consist of terracotta cladding, brickwork and render with aluminium windows and detailing.

The most recent renal dialysis unit has a steel framed structure with rendered masonry cavity walls, and an emergency unit with theatre facilities built during the 2000's has a steel frame and block work external walls with either terracotta rain screen cladding or render finish, and aluminium framed curtain walling.

There are also a number of single storey temporary building to the north west of the main building and an energy centre and boiler flue adjacent to the estates buildings to the west of the ring road.

The condition, functionality and performance of the buildings on site vary with 40% of the estate is over 50 years old; The majority of buildings on Withybush site ranked as condition C are the original buildings, including the residential blocks. The original clinical block is surrounded by more recent extensions which are generally condition category A/B.

There has been limited investment since the opening of the original building and most areas of the hospital now require comprehensive refurbishment. This process has commenced with refurbishment of the Pathology department and some ongoing ward refurbishments. There is a total of £18.8m in value of backlog maintenance at March 2021 with £12.9m categorised as significant risk at Withybush hospital.

Internally there are a significant number of the internal spaces which do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience. The configuration of internal spaces reflects the timing of the construction in the late 1970's and is no longer suitable for the delivery of safe clinical care. Many of the rooms are undersized compared to current guidance which reduces flexibility, impacts privacy & dignity increases infection risk and makes safe manual handling more difficult to achieve.

Many of the patient beds are arranged in 6 bed bays which are no longer recommended and the proportion of single rooms (26%), falls below current recommended standards. Very few bedrooms are equipped with en-suite facilities. Staff facilities are known to be below standard as well, with insufficient support spaces such as staff rooms, toilets, changing facilities and office accommodation.

There are also known statutory compliance issues with the hospital including those relating to electrical systems safety, asbestos, control of legionella and general Health & Safety at Work issues. The most significant statutory compliance issue relates to fire safety and a enforcement notice was issued by Mid and West Wales Fire and Rescue Authority in August 2019.

Much of the M&E infrastructure dates from the original build, and has now reached the end of its service life, despite some maintenance repairs and replacement have taken place, majority of them have been local and linked to specific issues. A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update electrical infrastructure, nurse call and bed head services, hot and cold pipework and heating infrastructure. A number of major plant items were also identified as being 'end of life' including chiller plant, LTHW boilers, foul water pumps and a number of AHUs. New engineering services plant and infrastructure will help move towards net zero carbon with replacement or upgrades of building fabric incorporating low carbon technologies.

As part of a wider site redevelopment strategy there may be an opportunity to demolish or re-develop some of the peripheral buildings around the site such as the existing staff residences and estates areas. These developments could help expand the current clinical services in modern fit-for-purpose accommodation, enhance the character of the site, create landscape areas to promote the wellbeing of patients and staff and improve staff retention.

For more details of the existing hospital especially the M&E service information please refer to section 2 of Appendix D.



Withybush Hospital Exterior Cladding



Withybush Hospital Ward Interior

4. Existing Estate

4.6 Community Facilities

As well as the four main acute sites the health board also currently operates seven community hospitals and numerous primary care and associated facilities across the three counties.

The seven Community sites are as follows;

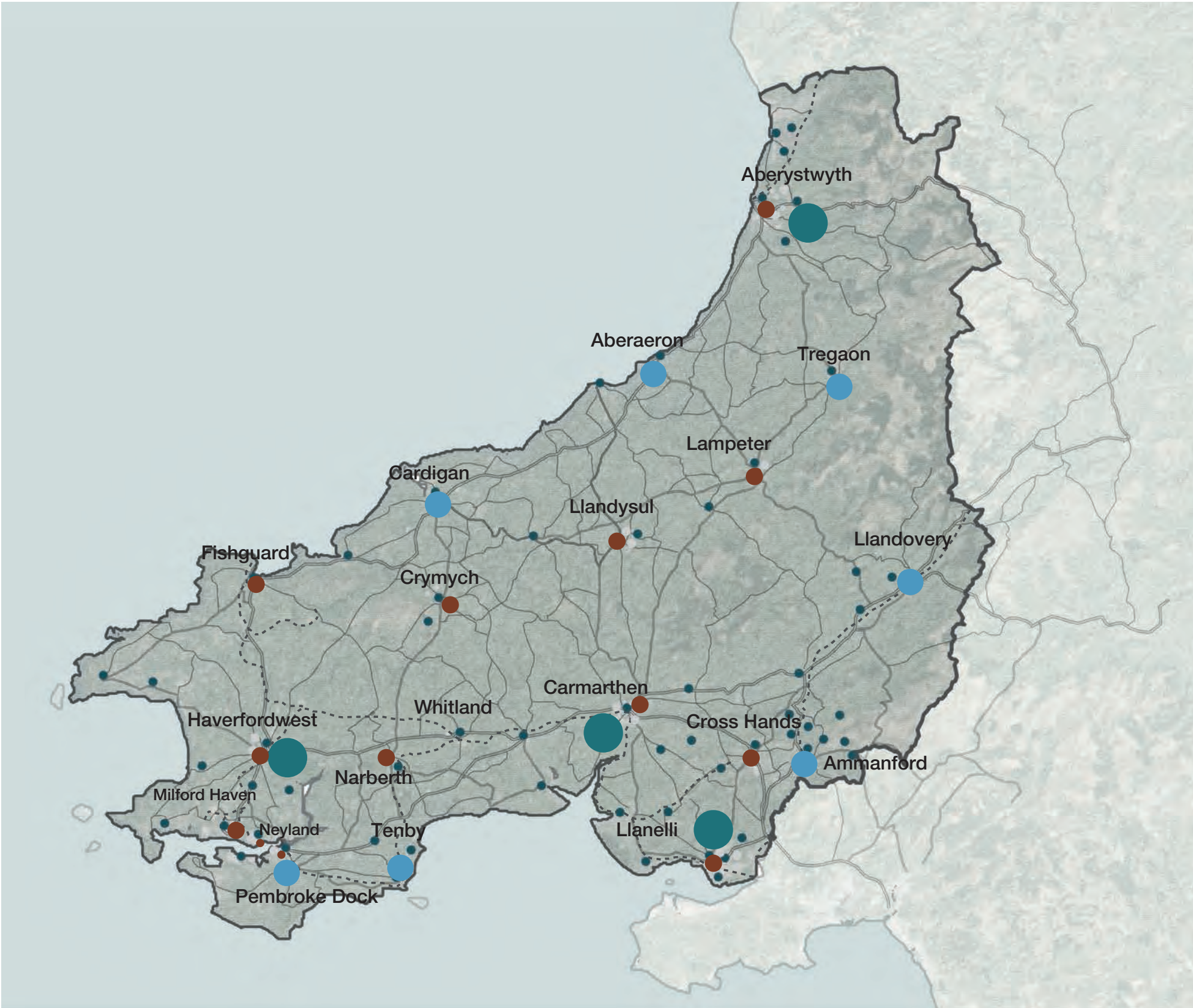
- Amman Valley Community Hospital
- Llandovery Hospital
- South Pembrokeshire Hospital
- Tenby Hospital
- Tregaron Hospital
- Aberaeron Integrated Care Centre
- Cardigan Integrated Care Centre

The 14 Community Health Centres/Clinics are as follows;

- Llwynhendy Health Centre, Llanelli
- Elizabeth Williams Clinic, Llanelli
- Crosshands Health Centre
- Pond St Clinic, Carmarthen
- North Road Clinic, Aberystwyth
- Padarn Health Centre, Aberystwyth
- Lampeter Medical Practice
- Pembroke Dock Health Centre
- Narberth Health Centre
- Haverfordwest Health Centre
- Bro Preseli Community Resource Centre, Crymych
- Milford Haven Health Centre
- Fishguard Health Centre
- Manchester Square Health Centre, Milford Haven

The Health Board also operates;

- 34 GP practices
- 15 GP branch practices
- 5 Managed practices
- 3 Third party developments
- 13 Mental health, learning disabilities and substance misuse facilities
- 47 dental practices (including 3 orthodontic),
- 99 community pharmacies,
- 44 general ophthalmic practices



Hywel Dda University Health Board catchment area with community and primary care facilities highlighted

4. Existing Estate

4.

The existing community estate occupies an area of circa 42,000sqm and has 153 beds including 55 mental health beds at Bro Cerwyn in Haverfordwest and Hafan Derwen in Carmarthen.

Significant infrastructure issues associated with the current community and primary care estate has been identified in order to provide modern, fit for purpose accommodation with the capacity to serve as an enabler to the provision of future health needs.

The physical infrastructure such as the condition and functional suitability of many of the existing premises is constraining the ability to adapt to meet a growing population with changing clinical needs and therefore preventing service developments across primary, community and secondary care.

More than half of the exiting community estate is over 50 years old with many buildings dating from the 19th century. There are also financial and workforce concerns relating to the future sustainability of a number of GP Practices within the Health Board.

The Health Board have benefited from recent investment in the community estate including new integrated care centres in Cardigan, Aberaeron and Fishguard, with schemes in progress at Cross Hands and Tregaron which will allow the closure and disposal of some of the older, less suitable facilities within the current estate.

In order to respond to the needs of an aging population who wish to receive their care closer to home and the aspiration to provide accessible and equitable care regardless of location, transformation in the way which the health and wellbeing of the local communities are supported has become increasingly important.

HDdUHB has committed to a transformation programme which will provide an opportunity to recognise the needs to support clinical excellence and to prioritise safe and high quality care.

Details such as location, condition and M&E infrastructure of some community hospitals and hubs included in the Transformation Programme can be found in section 2 of Appendix F.



Amman Valley Community Hospital 1936



Aberaeron Integrated Care Centre

5. Project Brief

5.

5.1 Summary of Functional Content

The Health Board ten-year health and care strategic vision, “A Healthier Mid & West Wales: Our Future Generations Living Well” (AHMWW) sets out the strategy for whole system change following the outcome of its previous public consultation exercise in November 2018.

The strategy describes the commitment to work in an integrated way across health and social care at a local and regional level, placing significant emphasis on the people and communities which access services provided by the Health Board.

During the initial consultation phase the Health Board identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported:-

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision and health outcomes across the three counties, for example there is a 10-year gap in healthy life expectancy across the area.

The consultation phase culminated with the Health Board describing a future model of care based around a network of integrated health & wellbeing centres and community hospitals which will bring key services and staff together in one place and provide virtual links between the local population and specialist services at the acute hospital sites.

The estate strategy which supports this model of care, known as ‘Proposal B’ considers the future transformation of the acute hospital estate and the associated implications on the community infrastructure.

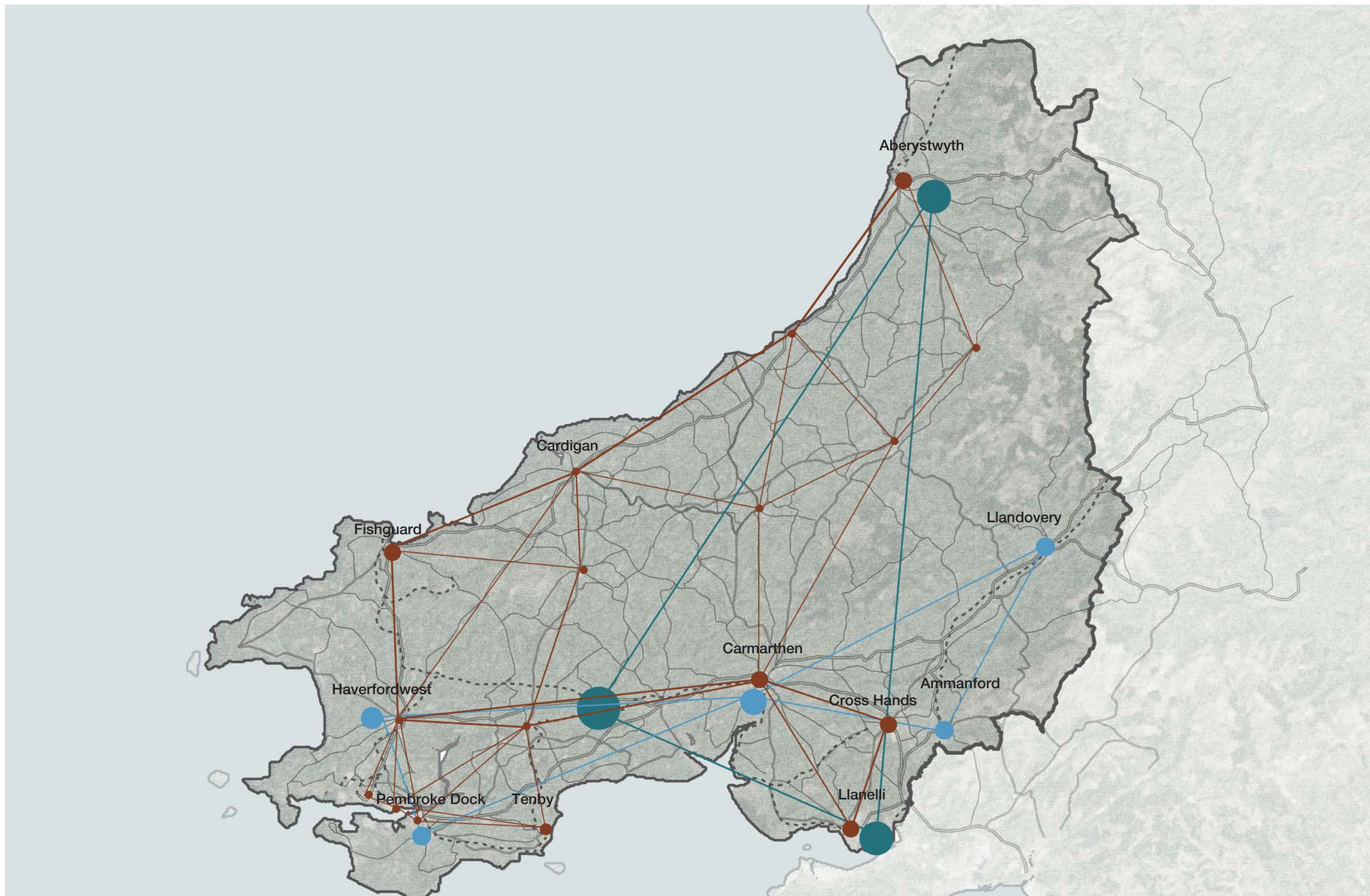
It includes provision of a new urgent and planned care hospital in the south of the region which will centralise all specialist children and adult services. The hospital sites at Withybush and Glangwili will be repurposed as community facilities with beds. Prince Philip and Bronglais hospitals in Llanelli and Aberystwyth will remain as general hospitals with refurbishment works as necessary to support the overall changes to the service model.

The model will be based around a series of integrated community networks each of which is supported by one or more health and well-being centres which will colocate staff and services and provide virtual links between the population and the community network. Multidisciplinary teams and the wider networks will wrap around individuals and families.

In addition to providing access to diagnostics and consultations, the service offering within the community network will also include step-down/step-up beds to prevent individuals from needing to go to hospital as well as to support timely discharge. This will include beds within the community hospitals as well as commissioned beds within nursing and residential homes and extra care supported living facilities as well as providing support and care to people in their own homes.

The proposed changes create significant opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce.

The findings from the phase 1 consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.



Proposal B: Network of proposed acute and community sites

5.2 Proposed Model of Care

The estate strategy assumes the transformation of the acute hospital estate and the associated implications on the community infrastructure as follows:-

- New Urgent and Planned Care Hospital located between Narberth and St Clears in the South of the region
- Refurbished Bronglais General Hospital in Aberystwyth;
- Refurbished Prince Philip General Hospital in Llanelli;
- Repurposed Glangwili Community Hospital in Carmarthen;
- Repurposed Withybush Community Hospital in Haverfordwest;
- Restructured network of local community hubs.

The Urgent and Planned Care Hospital site will be the main site for the network of hospitals providing urgent and planned care across the Health Board. It will offer a more centralised model for all acute adult and children services and will also include specialist mental health facilities.

The aspiration is for 50% of admissions to have a maximum length of stay of 72 hours requiring services to be operational 24/7, including access to diagnostics. Achievement of this aspiration will be dependent on a whole system approach to service delivery requiring timely transfer of patients from this site to the step-down beds located within the network of Community Hospitals. Services to be provided from the Urgent and Planned Care Hospital include:-

- Emergency Department with Trauma Unit.
- 24/7 access to acute specialties (medicine, surgery, obstetrics & gynaecology, paediatrics).
- 24/7 diagnostic support.
- Planned major day case, inpatient operations and treatment.
- Cardiac catheter and pacing laboratory.
- Critical Care (Levels 1, 2 and 3).
- Specialist outpatient services.
- Mental health and learning disabilities services.
- Multi-professional health education facility.
- Research and innovation facilities, including Institute for Life Sciences.

These services are described in more detail in Appendix E and in the High Level Brief prepared by SHP.

Bronglais General Hospital will build its reputation as an excellent rural provider of acute and planned care. It will continue to provide the current range of urgent, emergency and planned care services with more specialist cases transferred to the main Urgent and Planned Care Hospital.

Services to be provided from Bronglais Hospital include:-

- 24/7 Emergency Department and Urgent Car
- 24/7 access to acute specialties (medicine, surgery, obstetrics & gynaecology, paediatrics)
- 24/7 diagnostic support
- Critical Care (Levels 1, 2 and 3)
- Planned major day case, inpatient operations and treatment
- Day case elective facilities including endoscopy
- Midwife led unit and low-risk obstetrics
- Outpatient services including Chemotherapy
- Older Adult inpatient mental health beds

Prince Philip General Hospital will operate as a local general hospital, supporting acute medical admissions. The hospital will require consultant-led overnight beds with diagnostic support and will act as a stabilisation and transfer hub for certain specialised conditions. There will be a greater medical presence on this site compared to Glangwili and Withybush Hospitals. There is also an ambition to build on existing local services that can thrive as centres of excellence (e.g. breast surgery).

Services to be provided from Prince Philip Hospital include:-

- 24/7 GP led urgent care
- 24/7 access for acute medicine supported by consultants and teams plus high dependency care capability
- 24/7 diagnostic support
- Critical Care (Levels 1, 2 and 3)
- Low risk day case surgery and endoscopy
- Outpatient clinics and specialist ambulatory 'hot' clinics plus Chemotherapy
- Facilities to offer midwife-led deliveries

Glangwili and Withybush Hospitals will operate as local community hospitals. Beds will be therapy and nurse led, focusing on rehabilitation and less acute needs (step up from the community /step down from the acute hospital). There will be access to diagnostics and general outpatient clinics with more specialist assessments taking place at the Urgent and Planned Care Hospital.

Services to be provided from the Glangwili and Withybush sites include:-

- 24/7 GP led urgent care centre;
- Therapy and nurse led step up and step-down beds (less critical needs or rehabilitation);
- Outpatient clinics and specialist ambulatory 'hot' clinics;
- Facilities for an identified range of day case procedures;
- Midwife led units;
- Access to diagnostic support (x-ray, ultrasound, mammography);
- Renal Dialysis and Chemotherapy.

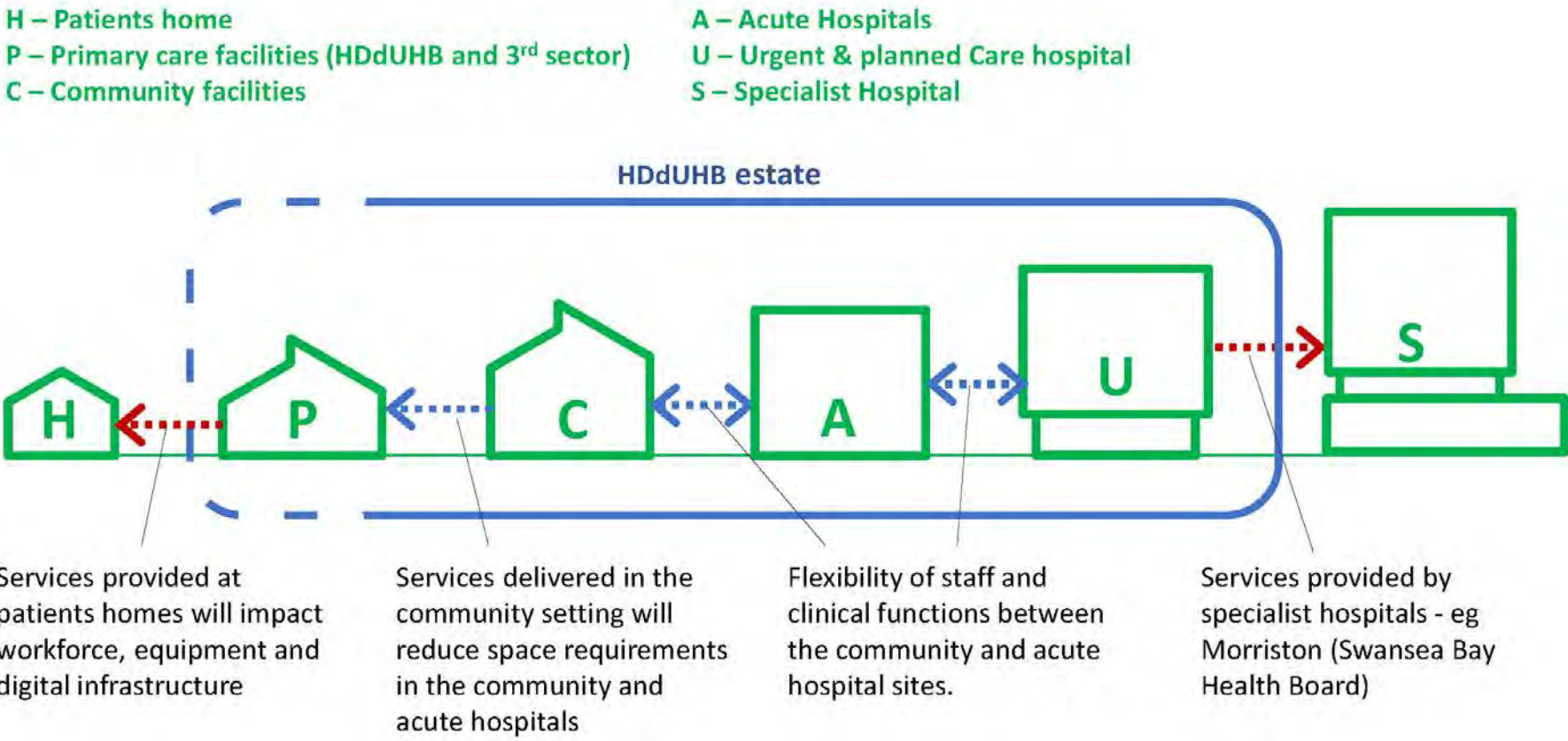
Each of the integrated Community Networks will be supported by one or more community hubs which will bring a number of people and services together in one place and also provide virtual links between the population and the community network. Multidisciplinary teams and the wider networks will provide ‘wrap around care’ for individuals and families.

In addition to providing access to diagnostics and consultations, the service offering within the community hubs will also include community beds to prevent individuals from needing to go to hospital and to support timely discharge from the system. This will include beds within the Health Board estate and commissioned beds within nursing and residential homes as well as providing support to people in their own homes. These community hubs form an essential element of the whole system approach to delivering care.

The range of services anticipated to be present within the community hubs might include:-

- Outpatient clinics supported by diagnostic tests and scans, including x-rays.
- Treatment for minor illness and minor injury.
- Planned and preventative care for people living with long term conditions.
- Overnight stay for patients unable to remain at home but not requiring a hospital care (step-up care), rehabilitation after a stay in hospital (step-down care) and assisted living.
- Mental health advice and support.
- Advice and support on a range of health and wellbeing needs including information on preventing and treating illness.

Understanding the service model



Service Configuration Model

5.3 Summary of Estates Options

Through the development of the briefing information the Health Board have identified a range of service transformation scenarios which are primarily driven by assumptions on future bed numbers. These are described as follows:-

‘Do nothing scenario’ where the current service is retained with no major reconfiguration or transformation.

‘Do minimum scenario’ where the current service is retained with minor transformation of services to align with the AHMWW strategy and with focussed investment in new community projects and to bring the acute hospital estate up to Condition B.

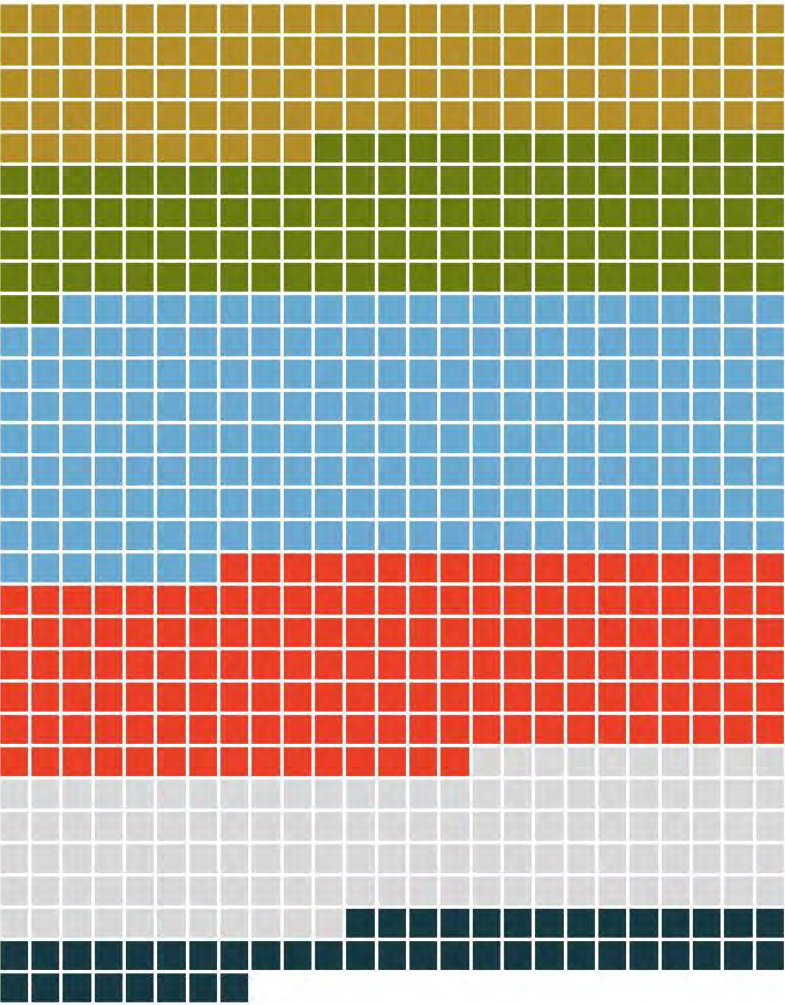
‘Minimum efficiency scenario’ where Services are transformed to align with the AHMWW strategy based on pessimistic design assumptions. This scenario assumes a higher number of retained beds with increased retention of beds on the community sites and minimum numbers transferred to the new Urgent & Planned Care Hospital. This scenario also assumes the retention of day surgery at both Glangwili and Withybush.

‘Likely efficiency scenario’ where services are transformed to align with the AHMWW strategy based on a “most likely” set of design assumptions to determine a reduction in bed requirements generally with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites.

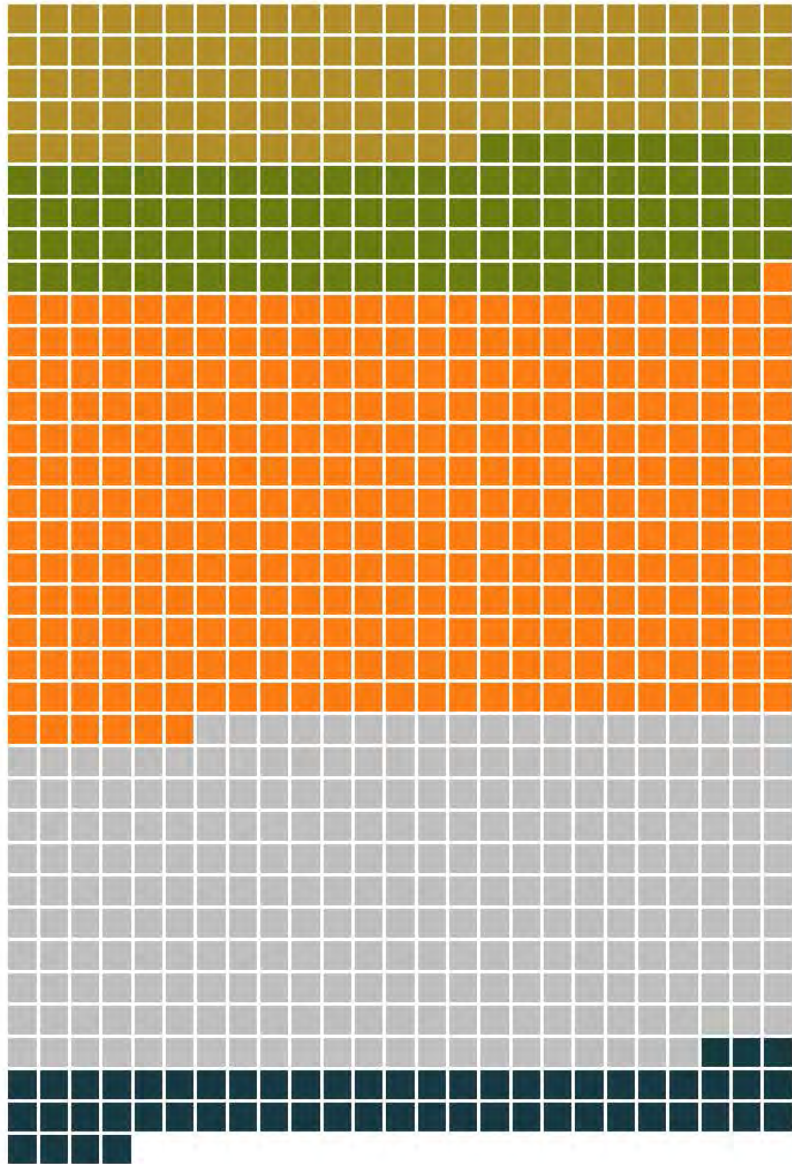
‘Maximum efficiency scenario’ where Services are transformed to align with the AHMWW strategy with more ambitious design assumptions applied. The scenario minimises the requirement for beds at the Urgent & Planned Care Hospital and on the associated community sites.

The impact of the various efficiency scenarios on the existing sites and on the cost and programme is considered in more detail in the following sections.

Existing estate area 189,613sqm



Proposed estate area 219,510sqm



Existing areas taken from 2021 EFPMS data
Proposed UPCH area taken from SHP schedule of areas 06.10.2021
Proposed areas for Bronglais and Prince Philip based on assessment of potential for refurbishment
Proposed community areas are estimated and includes Withybush and Glangwili

	Existing area (sqm)	Existing Beds	Proposed area (sqm)	Proposed beds
Bronglais Hospital	27,531	155	28,673	152
Glangwili Hospital	51,294	381	0	0
Prince Philip Hospital	29,297	216	27,367	169
Withybush Hospital	39,477	213	0	0
Urgent & Planned Care Hospital	0	0	82,918	506
Mental Health (see note below)	11,818	107	8,161	98
Aggregated community sites	30,196	98	72,391	209
Totals	189,613	1,170	219,510	1,134

Existing areas taken from 2021 EFPMS data

Existing bed numbers from HB activity model with mental health beds added for comparison

Mental Health existing areas include Bro Cerwyn & Hafan Derwen.

Mental health existing beds include 10 @ Bronglais, 42 @ Prince Philip, 30 @ Hafan Derwen and 25 @ Bro Cerwyn.

Proposed acute areas taken from SHP schedule of areas 06.10.2021 based on the likely scenario (residences removed at BGH, Withybush and Glangwili)

Proposed Urgent & Planned Care Hospital campus figures include standalone administration/teaching and residential accommodation

Proposed Mental Health figures based on new unit at the Urgent and Planned Care Hospital site

Proposed community areas are estimated and include 14,515sqm and 72 beds @ Glangwili and 13,793sqm and 48 beds @ Withybush

5.4 Likely Way Forward

The Likely way forward is based on a 'Likely efficiency scenario' where services are transformed to align with the AHMWW strategy based on the most likely set of design assumptions to determine a reduction in bed requirements generally with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites.

The likely efficiency scenario assumes the following functional content across the estate

New Urgent & Planned Care site

A new Urgent & Planned Care Hospital of circa 69,983sqm (briefed area) with 506 inpatient beds including 421 acute inpatient beds, 48 assessment, 22 critical care and 15 neonatal cots. The interventional facilities will include 16 operating theatres (including 1 interventional radiology and 2 obstetric theatres), 6 day case theatres and 3 endoscopy suites. Diagnostic facilities will include 4 X-Ray suites, 3 CT and 2 MR, A gamma camera, IR and fluoroscopy suites. The Hospital is briefed to have 20 emergency treatment rooms, 10 generic outpatient rooms and facilities for chemotherapy and renal dialysis.

Spaces for clinical and non-clinical support are included based on a hub and satellite model with primary facilities for pharmacy, sterile services, pathology and clinical engineering located on the new UPOCH site.

The brief also includes allowances for a new mental health facility with 98 inpatient beds and associated outpatient and community spaces, and new education and administration facilities which may be provided in a new standalone unit.

Bronglais Hospital

In the likely efficiency scenario Bronglais Hospital is assumed to undergo a programme of refurbishment of the existing estate which will be undertaken in a phased manner whilst the site remains operational. The functional brief assumes 141 inpatient beds, 2 operating theatres, 3 day-case theatres and an endoscopy suite. Existing CT and MR imaging facilities are retained on the site along with emergency and outpatient capacity.

The total briefed area in the likely scenario is 28,673sqm which also includes allowances of 12% and 17.5% for communication space and plant space respectively.

Glangwili Hospital

The likely efficiency scenario for Glangwili describes a functional requirement which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The likely scenario also includes three 24-bed inpatient wards (72 beds in total).

The total briefed area for this option is 15,548sqm which includes allowances of 11% and 12% for communication space and plant space accordingly. Allowances are included for local FM stores including catering, consumables and waste management.

The site will include satellite hubs for clinical and non-clinical support with local storage for pharmacy, sterile services and engineering, body stores and a pathology hub.

Prince Philip Hospital

In the likely efficiency scenario Prince Philip Hospital is assumed to undergo a programme of refurbishment of the existing estate which will be undertaken in a phased manner whilst the site remains operational. The functional brief assumes 169 inpatient beds, 2 day-case theatres and an endoscopy suite. Existing CT and MR imaging facilities are retained on the site whilst the existing emergency department will be repurposed as a 24/7 GP led minor injuries unit.

The total briefed area in the likely scenario is 27,367sqm including allowances of 12% and 17.5% for communication space and plant space respectively. It is assumed that existing FM areas including catering, consumables and waste management will be retained

Withybush Hospital

The likely efficiency scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The minimum scenario also includes two 24-bed inpatient wards (48 beds in total).

The total briefed area for this option is 13,793sqm which includes allowances of 11% and 12% for communication space and plant space accordingly. Allowances are included for local FM stores including catering, consumables and waste management.

The site will include satellite hubs for clinical and non-clinical support with local storage for pharmacy, sterile services and engineering, body stores and a pathology hub.

Community sites

Proposals to transform the community infrastructure are consistent across all efficiency scenarios. In the future a network of community hubs will provide a range of health and care services such as advice and support for patients and their families, minor injuries units, step-up and step-down intermediary care beds, point of care testing and diagnostics. The service offering within the community hubs will also include community beds to prevent individuals from needing to go to hospital and to support timely discharge from the system.

For the purposes of this Programme Business Case the community estate infrastructure proposals are based on a series of assumptions relating to the potential size and complexity of each of the proposed community hubs. These assumptions have been informed by the community directors for the three counties of Carmarthenshire, Ceredigion and Pembrokeshire.

A number of community projects have been recently completed or are currently in the process of design development.

The above notes describe the functional brief associated with the likely efficiency transformation scenario. The various appendices to this report include more detailed descriptions of each scenario along with an assessment of the physical implications of the transformation including new build vs refurbishment projects for each of the sites.

Likely Efficiency Scenario							Minimum Efficiency Scenario							Maximum Efficiency Scenario						
Functional Units	Comments	Urgent / Planned Care Hospital	Bronglais	Prince Philip	Glangwili	Withybush	Comments	Urgent / Planned Care Hospital	Bronglais	Prince Philip	Glangwili	Withybush	Comments	Urgent / Planned Care Hospital	Bronglais	Prince Philip	Glangwili	Withybush		
ED Rooms (inc MIU element)	Aligned to WHBN HB confirmed 9/9/21	20	12				No change from likely scenario	20	12				No change from likely scenario	20	12					
MIU Rooms	Aligned to WHBN HB confirmed 9/9/21			10	7	5				10	7	5					10	7	5	
Acute Admission Beds	Assumption - HB confirmed 7/9	48	24	24				48	24	24					48	24	24			
Acute IP Beds	Aligned with Activity Model v11 (less acute admission, critical care and neonatal)	421	112	140			Change from likely scenario Aligned to activity model	316	120	176			Change from likely scenario Aligned to activity model	369	98	100				
Rehab / Stop up and down beds	Aligned with Activity Model v11				72	48					155	100						72	48	
	Number of wards	18	5	6	4	3		13	5	8	7	4		16	4	4	4	3	2	
Critical Care	HB instruction 31/8/21	22	4	5	0	0	No change from likely scenario	22	4	5			No change from likely scenario	22	4	5				
Neonatal	Aligned to W&C Business Case	15	1	0	0	0	No change from likely scenario	15	1				No change from likely scenario	15	1					
Day Case Trolleys	Aligned with Activity Model v11	26	12	9	7	10	Change from likely scenario HB brief 19/10/21 - trolley numbers aligned to theatre capacity NOT the activity model	20	12	17	17	17	Change from likely scenario HB brief 19/10/21	25	11	17	7	8		
	Trolley configuration (as per SOA v2.2)	24x bays and 8x recliners	8x bays and 4x recliners	8x bays and 4x recliners	7x bays and 3x recliners	7x bays and 3x recliners		16x bays and 6x recliners	8x bays and 4x recliners	12x bays and 6x recliners	12x bays and 6x recliners	12x bays and 6x recliners		24x bays and 8x recliners	8x bays and 4x recliners	12x bays and 6x recliners	7x bays and 3x recliners	7x bays and 3x recliners		
Theatres (Inpatient)	HB instruction 31/8/21	13	2	0	0	0	No change from likely scenario	13	2				No change from likely scenario	13	2					
Theatre (Interventional Radiology)	HB instruction 31/8/21	1	0	0	0	0	No change from likely scenario	1					No change from likely scenario	1						
Theatres (Day Case)	HB instruction 31/8/21	6	3	2	0	0	Change from likely scenario HB brief 19/10/21	3	3	2	2	2	No change from likely scenario	6	3	2				
Day Case (Procedures Room)	HB instruction 31/8/21	0	0	0	1	1	Change from likely scenario HB brief 19/10/21				0	0	No change from likely scenario				1	1		
Endoscopy Suite	HB instruction 31/8/21	3	1	1	0	0	Change from likely scenario HB brief 19/10/21	2	1	1	1	1	No change from likely scenario	3	1	1	0	0		
Catheter Lab	HB instruction 31/8/21	1	0	0	0	0	No change from likely scenario	1					No change from likely scenario	1						
Obstetric Theatre	Aligned to W&C Business Case	2	0	0	0	0	No change from likely scenario	2					No change from likely scenario	2						
Delivery Suite	Aligned to W&C Business Case	7	3	0	0	0	No change from likely scenario	7	3				No change from likely scenario	7	3					
Midwifery Led Unit	Aligned to W&C Business Case	0	0	1	3	3	Change from likely scenario HB brief 19/10/21			3	3	3	No change from likely scenario	0	0	1	3	3		
X-Ray	HB instruction 31/8/21	4	2	2	2	2	No change from likely scenario	4	2	2	2	2	No change from likely scenario	4	2	2	2	2		
Ultrasound	HB instruction 31/8/21	4	2	2	2	2		4	2	2	2	2		4	2	2	2	2		
CT	HB instruction 31/8/21	3	1	1	0	0		3	1	1	0	0		3	1	1	0	0		
MRI	HB instruction 31/8/21	2	1	1	0	0		2	1	1	0	0		2	1	1	0	0		
Gamma Camera	HB instruction 31/8/21	1	0	0	0	0		1	0	0	0	0		1	0	0	0	0		
Fluoroscopy	HB instruction 31/8/21	1	0	0	0	0		1	0	0	0	0		1	0	0	0	0		
Interventional Radiology	HB instruction 31/8/21	1	0	0	0	0		1	0	0	0	0		1	0	0	0	0		
Mammography	HB instruction 31/8/21	1	1	1	0	0		1	1	1	0	0		1	1	1	0	0		
Generic Outpatient Rooms	Activity aligned with Activity Model v11 and high level modelling - HB confirmed 9/9/21	10	7	18	13	17	No change from likely scenario	10	7	18	13	17	No change from likely scenario	10	7	18	13	17		
Pre-Op Assessment	Space allowance																			
Renal Dialysis	HB instruction 9/9/21 - model at OBC	16	16	16	16	16		16	16	16	16	16		16	16	16	16	16	16	
Chemotherapy																				
Cardiac, Pulmonary and Neurophysiology Diagnostics	HB confirmed 9/9/21	10	2	2	2	2		10	2	2	2	2		10	2	2	2	2	2	
Ante Natal	HB confirmed 9/9/21	4	2	2	2	2		4	2	2	2	2		4	2	2	2	2	2	
Nuclear Medicine	Aligned to Gamma Camera	1	0	0	0	0	1						1							
Rehabilitation (Therapies OP)	HB confirmed 7/9/21 Separate provision for IP	0	6	6	6	6			6	6	6	6			6	6	6			
Breast Unit	ER meeting 7/9/21	0	0	8	0	0				8						8				
Palliative Care	No on site provision	0	0	Ty Brynwyn	0	0				Ty Brynwyn						Ty Brynwyn				
Inpatient: Adults	HB confirmed 17/8/21	37	0	0	0	0	No change from likely scenario	37				0	Bro Cerwyn	37				0	Bro Cerwyn	
Inpatient: Older Adults	HB confirmed 17/8/21	30	11	0	0	0		30	11			0	Bro Cerwyn	30	11			0	Bro Cerwyn	
Inpatient: Learning Disability	HB confirmed 31/8/21	3	0	0	0	0		3				0		3				0		
Inpatient (Psychiatric Intensive Care)	HB confirmed 31/8/21	8	0	0	0	0		8				0		8				0		
Inpatient (Low Secure Male)	HB confirmed 31/8/21	18	0	0	0	0		18				0		18				0		
Inpatient (CAMHS)	HB confirmed 31/8/21	2	0	0	0	0		2				0		2				0		
Assessment / Day Facilities	HB confirmed 17/8/21	4	0	0	0	0	4					0	Bro Cerwyn	4				0	Bro Cerwyn	
Section 136 Suite	HB confirmed 31/8/21	3	0	0	0	0	3					0		3				0		

High Level Summary of Functional Content Diagram

6. Programme & Implementation Strategy

6.

6.1 Implementation Strategy

A significant programme of estates improvement is being proposed to support the 'Healthier Mid and West Wales' transformation proposals.

In order to provide an estate suitable and sustainable for 21st century healthcare a range of high level new build and refurbishment options have been developed for the existing Glangwili, Withybush, Bronglais and Prince Phillip hospital sites.

In order to enable the estates improvement programme to commence the intention is to progress all outline and full business cases concurrent with the outline and full business case for the new Urgent and Planned Care Hospital. This allows regular co-ordination of reporting at programme level to the Welsh Government. However, construction periods commencements are different and outlined below.

The implementation programme is structured to maximise the transformation of clinical services at the earliest opportunity. This is achieved by providing the Urgent and Planned Care Hospital as a priority supported by reconfigurations and improvement to the community estate, in some cases new build solutions. Therefore, whilst not fully sequenced yet the intention is to roll out business cases and construction works for the community projects concurrent with the Urgent and Planned Care Hospital.

Implementation Programme Option 1 (Rev C) – New Build at Glangwili and Withybush has been identified as 'The Preferred Way Forward' within the Programme Business Case.

This option assumes new build developments on the existing Glangwili and Withybush sites to provide new community hospitals. The construction completion and opening of both new facilities is scheduled to occur at the same time as the completion and opening of the new Urgent and Planned Care Hospital. This approach provides a period of around 14 months for enabling works such as localised demolitions infrastructure alterations and service diversions to be undertaken to create the development zone for the new build developments.

All proposed community hub facilities are planned to be operational by the time the Urgent and Planned Care Hospital and the new community hospitals at Glangwili and Withybush are ready for opening. This allows a significant shift in the clinical service model towards the community-based model and care closer to home, maximising transformation.

As with all other projects the business cases for both Bronglais and Prince Phillip will be completed concurrent with those the rest of the capital programme of work. Construction work at Bronglais is planned to commence immediately following FBC approval as there are no dependencies. Due to the existing site constraints and anticipated phased approach of repurposing work at Bronglais works would be completed approximately 18 months after the new Urgent and Planned Care Hospital, new community hospitals and hub facilities have opened.

Works at Prince Phillip are more dependant on changes to the clinical services model. Therefore, main works are planned to commence upon completion of the new Urgent and Planned Care Hospital. However, as the full business case approval is planned to be achieved over two years prior to this, similar to the Glangwili and Withybush proposals. This provides the opportunity for enabling works such as localised alterations, infrastructure alterations, service diversions and extensions to ward block accommodation to be undertaken to create the headroom required to undertake an efficient site wide refurbishment programme.

The above will require further exploration, to determine detailed phasing and sequencing plans, at the Outline Business Case stage for each project.

A summary of key milestones for Implementation Option No. 1 is illustrated on the next page.

Whilst option 1 has been established as the 'preferred way forward' several alternative sequencing and implementation approaches have been considered.

Descriptions of these and the options and key differences are illustrated on the following pages. These options will require further exploration and evaluation, to determine detailed phasing and sequencing plans, at the Outline Business Case stage for each project.

6. Programme & Implementation Strategy

6.

6.1 Implementation Strategy

Timelines are preliminary and estimated at this stage, subject to PBC endorsement and decisions on most appropriate source(s) of funding, this decision being taken during the scrutiny process - this timeline is based on All Wales capital solutions.

Milestone	UPCC	GGH (new build)	WGH (new build)	PPH	BGH	Community
PBC Submission	End January 2022	End January 2022	End January 2022	End January 2022	End January 2022	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022	March-May 2022	March-May 2022	March-May 2022	March-May 2022	March-May 2022
OBC team selected (BfW framework)	May – July 2022	May – July 2022	May – July 2022	May – July 2022	May – July 2022	To be confirmed
Preferred site confirmed (potentially subject to consultation and heads of term)	By June 2022	Not applicable	Not applicable	Not applicable	Not applicable	
Option to purchase	July/August 2022	Not applicable	Not applicable	Not applicable	Not applicable	
Outline Planning Application	Dec-23	Dec-23	By Dec 2023	By Dec 2023	By Dec 2023	
OBC Submission	End January 2024	End January 2024	End January 2024	End January 2024	End January 2024	
Outline Planning Approval	End May 2024	End May 2024	End May 2024	End May 2024	End May 2024	
OBC Approval (WG)	Mid July 2024	Mid July 2024	Mid July 2024	Mid July 2024	Mid July 2024	
Reserved Matters Discharged (Planning)	Sep-25	By September 2025	By September 2025	By September 2025	By September 2025	
FBC Submission	Mid March 2026	Mid March 2026	Mid March 2026	Mid March 2026	Mid March 2026	
FBC Approval (WG)	Early June 2026	Early June 2026	Early June 2026	Early June 2026	Early June 2026	
Purchase Site completion	Mid July 2026	Not Applicable	Not applicable	Not applicable	Not applicable	
Period of site preparatory/demolitions/ enabling works	Not applicable	July 2026 – July 2027	July 2026 – July 2027	July 2026 – October 2028	Not applicable	
Start on site	Aug-26	Aug-27	August 2027	Nov-28	Jul-26	July 2024 onwards
Construction Completion	End May 2029	End June 2029	End June 2029	Jul-32	Jan-31	Various as schemes delivered
Commissioning	June – October 2029	July – October 2029	July – October 2029	Ongoing throughout refurbishments / repurposing	Ongoing throughout refurbishments / repurposing	Ongoing as schemes delivered
Opening	End October 2029	End October 2029	End October 2029	Not applicable	Not applicable	All open by October 2029

Timeline for Implementation Programme Option 1 (Rev C) - New Build at Glangwili and Withybush

6.2 Implementation Programme

Other options could be to stagger projects at the four existing acute sites, this would result in a much longer overall programme (multiple options if this logic is applied).

Assumes OBC and FBC for all sites are progressed concurrently.

Construction periods are based on estimated durations informed by high level estates options and capital cost assumptions.

- UPCC – 36 months construction
- GGH – new build 24 months construction / refurbishment 42 months construction (mix of new build and refurbishment)
- WGH – new build 24 months construction / refurbishment only 60 months construction
- PPH – 48 months total construction period (mix of new build and refurbishment)
- BGH - 60 months total construction period (mix of new build and refurbishment)

The only difference between options 1 & 2 is the timing of refurbishment works at BGH

The only difference between options 3 & 4 is the timing of refurbishment works at BGH

The only difference between options 5 & 6 is the timing of refurbishment works at BGH

The only difference between options 7 & 8 is the timing of refurbishment works at BGH

All options assume the repurposing of GGH and WGH happen at the same time as each other. Similarly, the same approach to repurposing on both sites is the same i.e. both new build or both refurbishment.

Assumption in all options is that refurbishment / reorganisation works of existing accommodation at PPH cannot substantially commence until the UPCH is complete and there is a shift to the new model of care due to continuation of the existing services. However, new build extensions at PPH can commence ahead of the UPCH being completed to provide headroom in readiness for refurbishment programme.

Options 7 & 8 – under these option works at GGH assumes a combination of part new build and part refurbishment whereas works at WGH assumes refurbishment only of retained estate. Sequencing of community hubs to be confirmed by Health Board. All Community Hub facilities to all be in place by the time the UPCC goes operational to facilitate the shift to the new model of care.

To be read in conjunction with the BDP options included within the PBC estates annex.

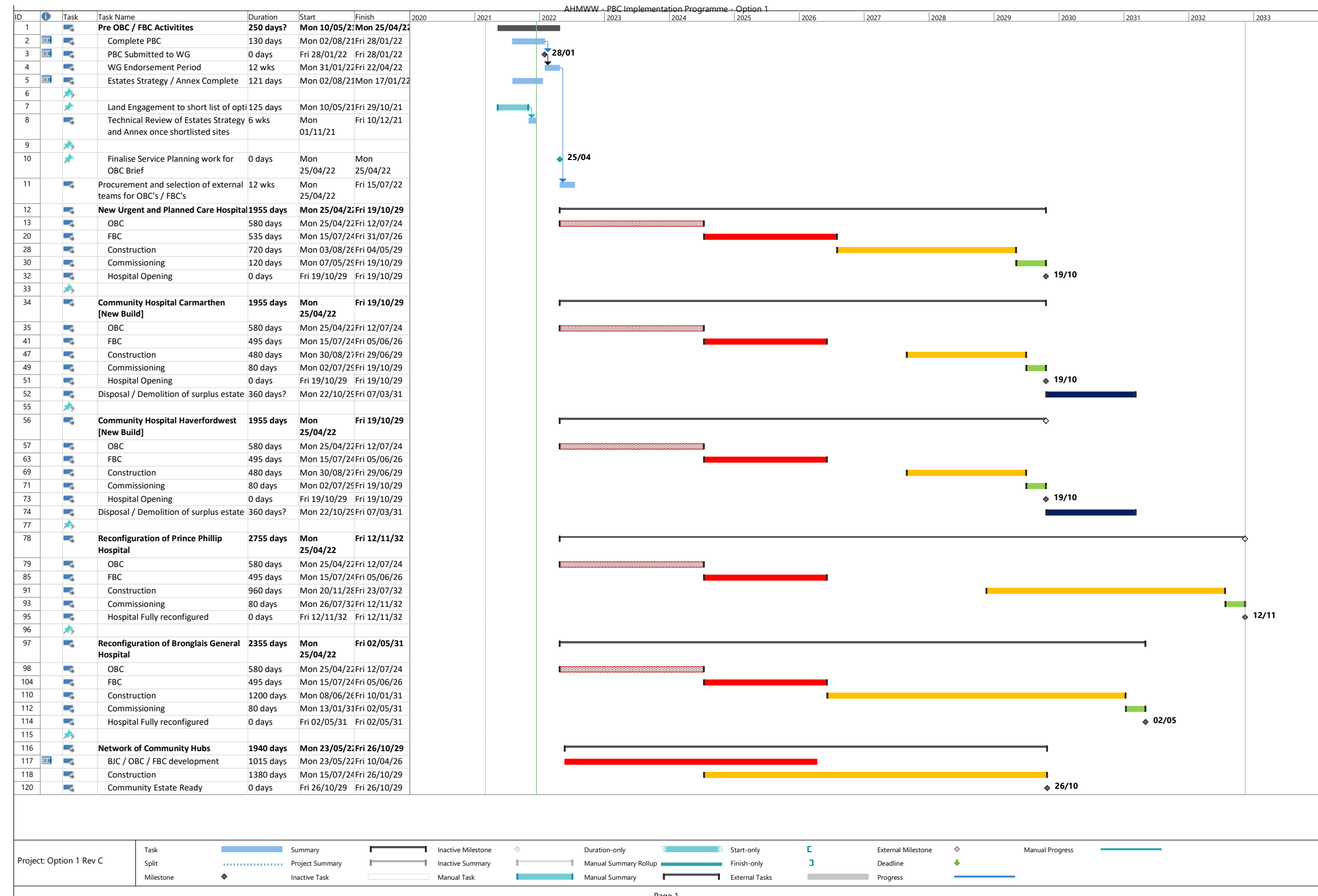
Non-acute MH projects excluded.

	Option No.	Summary of differences
New Build at WGH and GGH opening concurrent with new UPCC. Remodelling works at both BGH and PPH together with the development of a network of Community Hub facilities	Option 1	Preferred Way Forward for PBC
	Option 2	As option 1 although refurbishment works do not start at Bronglais until the opening of the new urgent and planned care hospital and new community hospitals at Glangwili and Withybush.
New Build at WGH and GGH opening ahead of new UPCC completion. Remodelling works at both BGH and PPH together with the development of a network of Community Hub facilities	Option 3	As option 1 although new builds at Glangwili and Withybush commence sooner allowing them to open ahead of the new urgent and planned care hospital.
	Option 4	As option 3 although refurbishment works do not start at Bronglais until the opening of the new urgent and planned care hospital
New Build at WGH and GGH opening following completion of the new UPCC. Remodelling works at both BGH and PPH together with the development of a network of Community Hub facilities	Option 5	As option 1 although new builds at Glangwili and Withybush would not commence until the new urgent and planned care hospital was open.
	Option 6	As option 5 although refurbishment works do not start at Bronglais until the opening of the new urgent and planned care hospital
Repurposed WGH and GGH sites completed after new UPCC. Remodelling works at both BGH and PPH together with the development of a network of Community Hub facilities	Option 7	As option 5 however instead of new builds at Glangwili and Withybush the existing sites would be repurposed via phased refurbishment works.
	Option 8	As option 6 however instead of new builds at Glangwili and Withybush the existing sites would be repurposed via phased refurbishment works.

Description options and key differences of implementation strategies

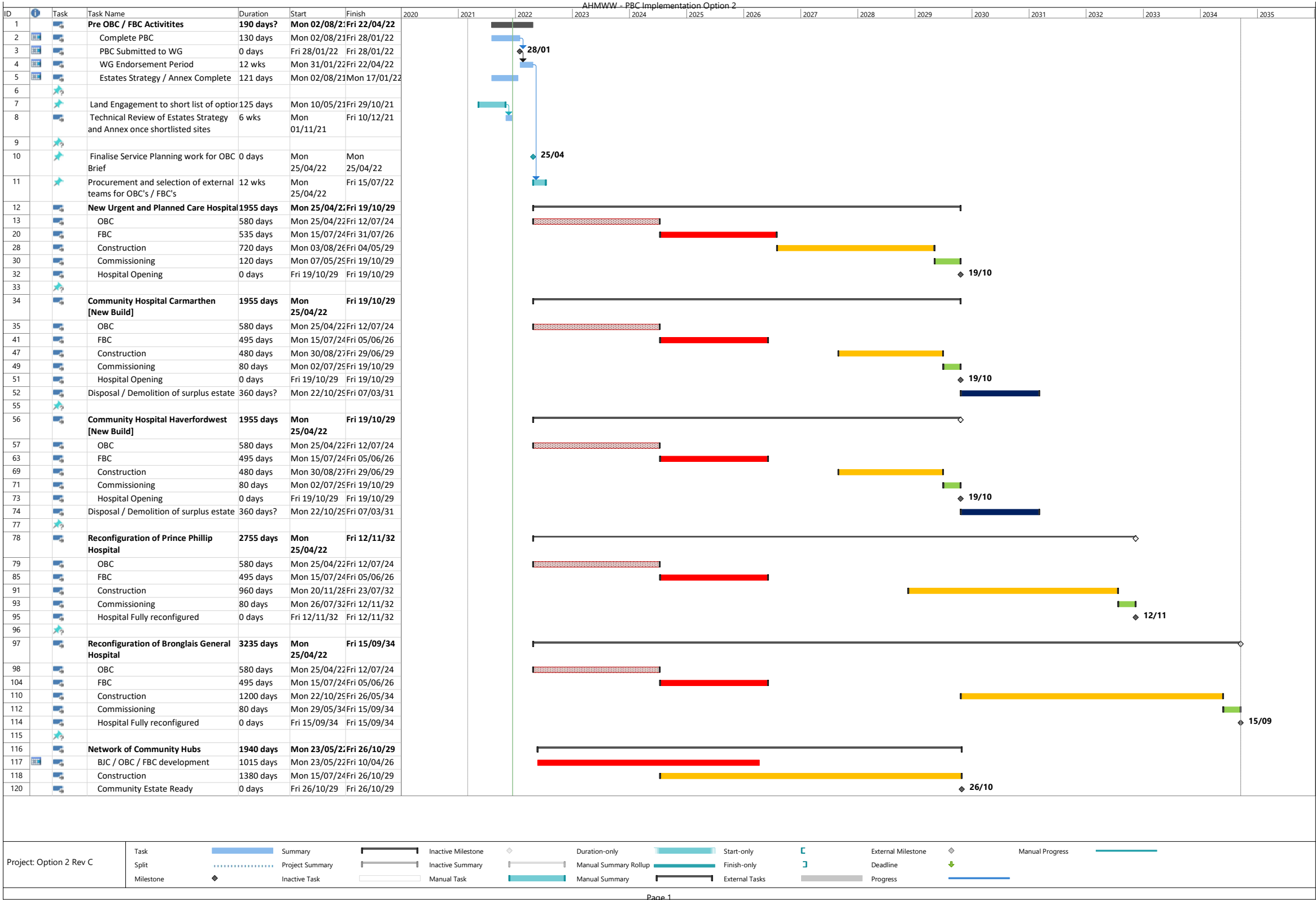
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6.2 Implementation Programme Option 1 - 'The Preferred Way Forward'



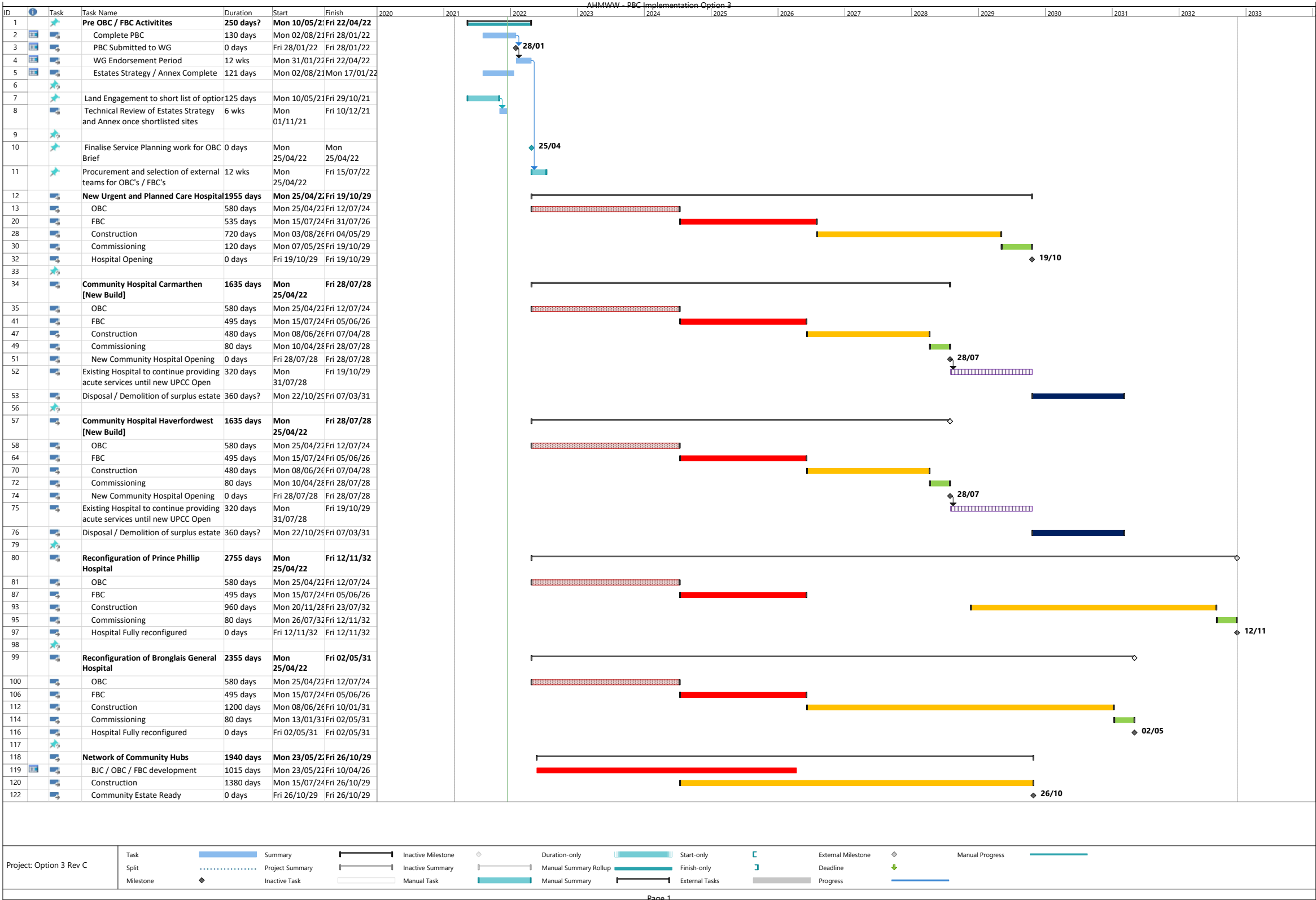
6. Programme & Implementation Strategy

6.2 Implementation Programme Option 2



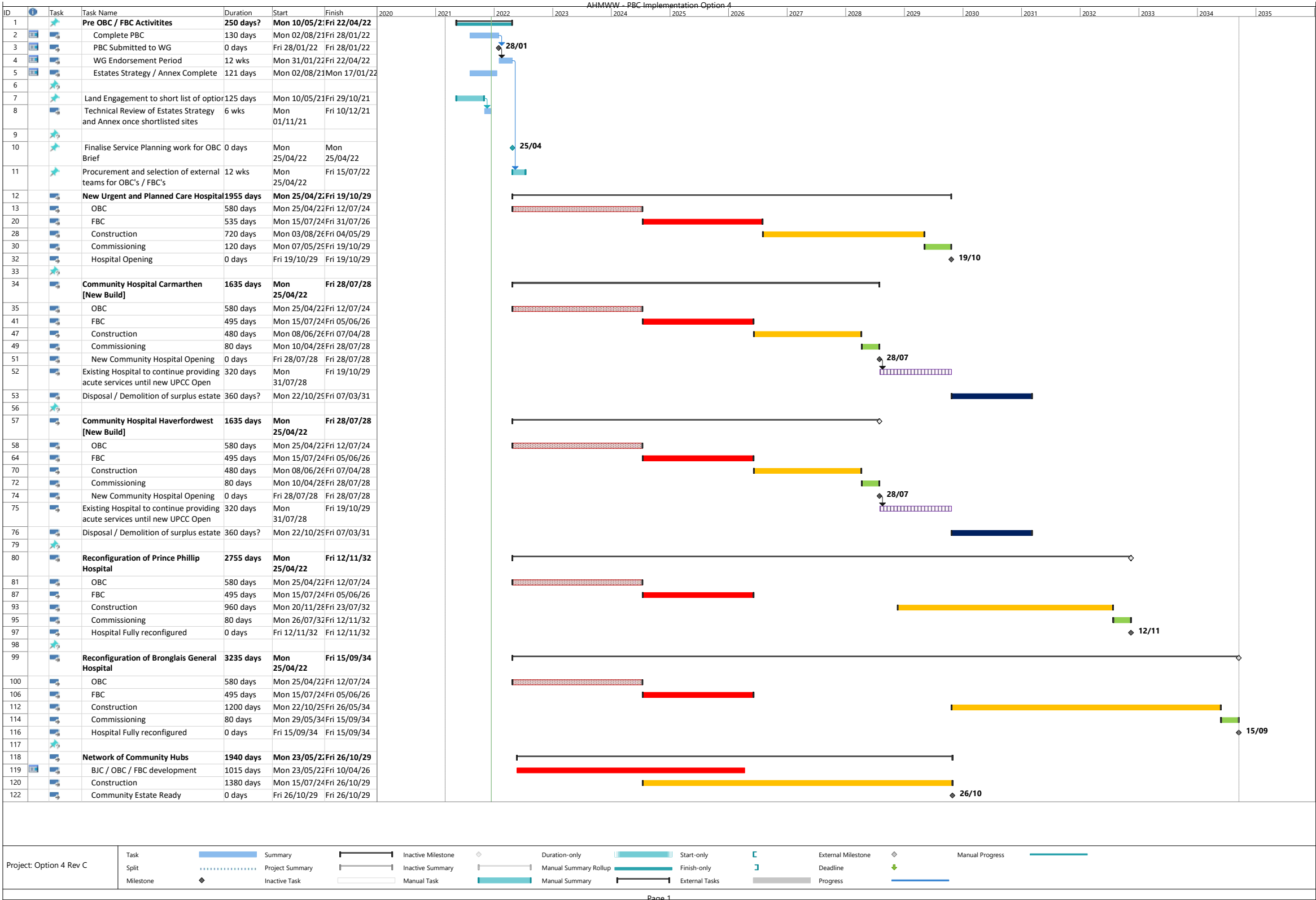
6. Programme & Implementation Strategy

6.2 Implementation Programme Option 3



6. Programme & Implementation Strategy

6.2 Implementation Programme Option 4

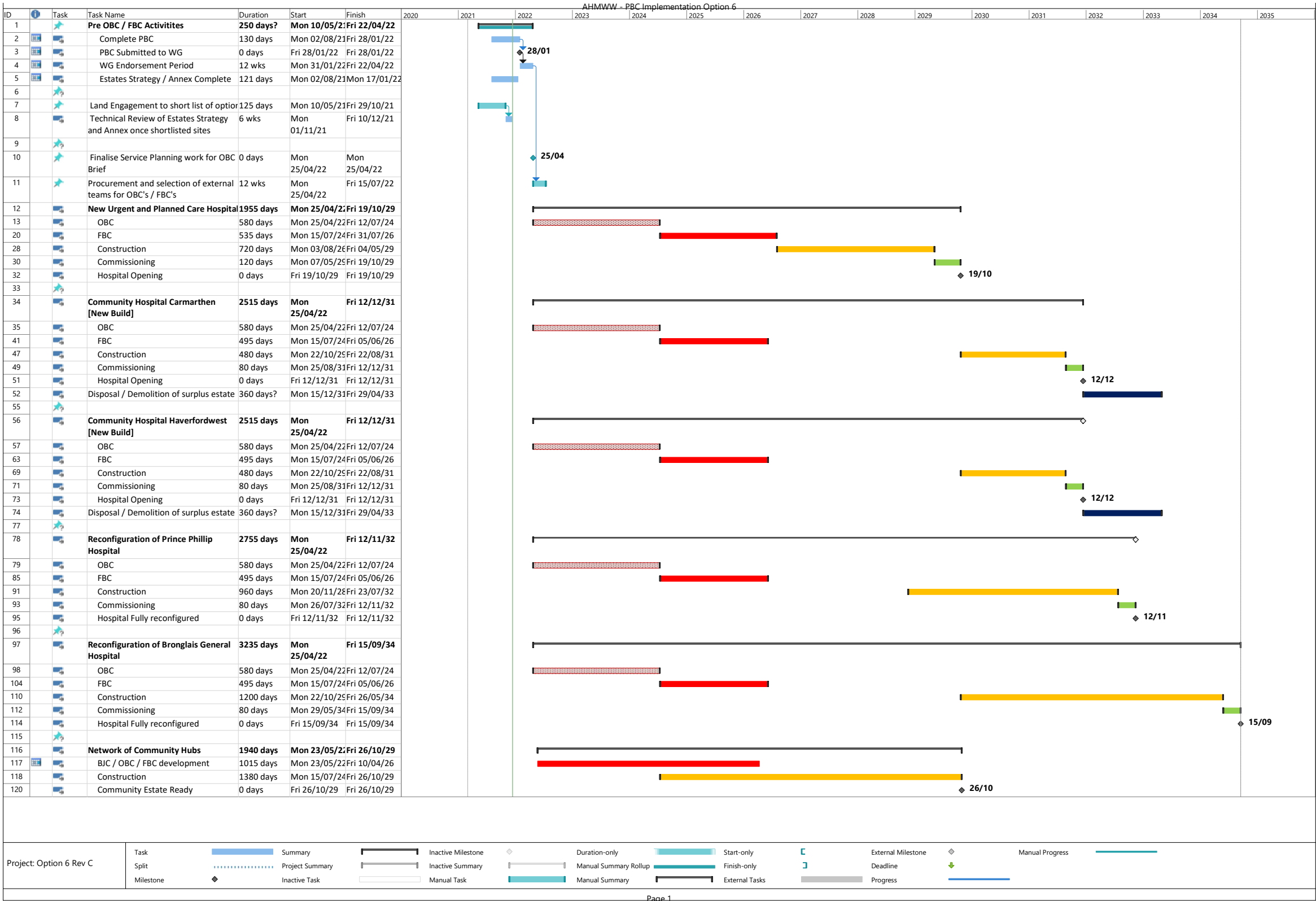


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6. Programme & Implementation Strategy

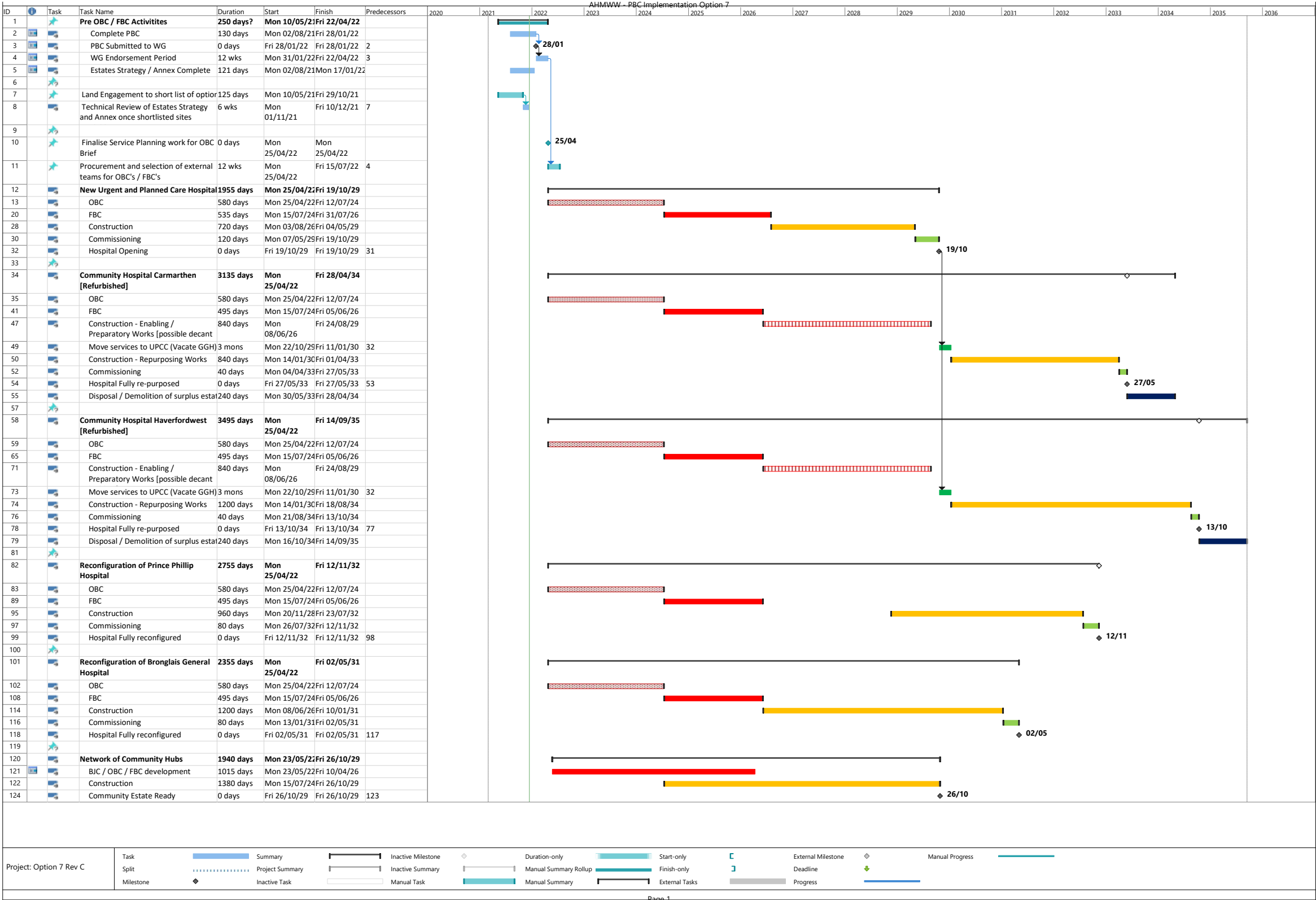
6.2 Implementation Programme Option 6



6. Programme & Implementation Strategy

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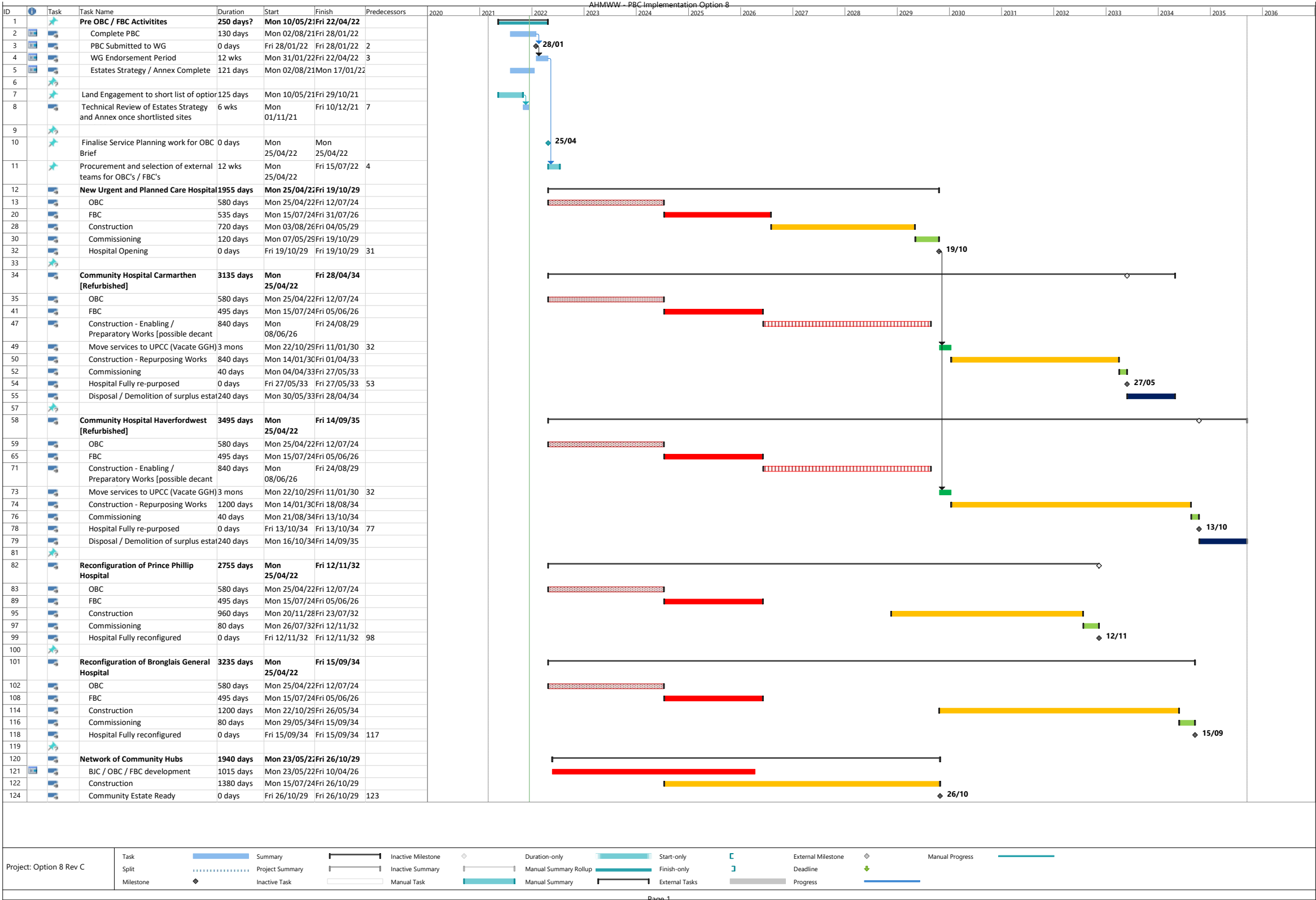
6.2 Implementation Programme Option 7



6. Programme & Implementation Strategy

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6.2 Implementation Programme Option 8



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7. Capital Costs & Cashflow

7.1 Capital Cost Summary

Costs for all schemes are based on an elemental cost per m2, and the traditional approach using DCAGs has not been followed. The rationale for this is that the DCAGs database has not been updated for a considerable time, and there have been several significant changes in both healthcare design standards and planning and building regulations requirements which render the DCAGs unreliable.

For new build options the basis of the elemental cost is the benchmark cost reports for similar schemes and the Grange Hospital elemental analysis, which takes account of a number of additional cost drivers including further regulatory change and design aspiration, as follows:-

- BREEAM 2018 in lieu of BREEAM 2014 – addition 0.75%
- Decarbonisation aspirations – addition 3%
- SMART costs – addition 1% (see Non-works costs for impact on IT costs)
- Biophilic Design aspirations – addition 2%
- Location – addition 2%

The percentage additions were derived from various sources and also take account of the area in which the developments are costed where considered required.

The basis of the elemental costs for the refurbishment options is benchmark costs, developed using an extensive database of costs, as above. The elemental costs are then adjusted to reflect the scope of the proposed refurbishment works. Major refurbishment is included with the assumption the existing building will be stripped back to the frame and structural repairs to the frame and roof will be required.

To calculate ‘on-costs’ a general £/sqm rate was applied to a indicative site area. This was compared to an adjusted cost using the ‘How to Cost a Hospital’ methodology to validate the costs included. Demolition costs are included only where appropriate to each option.

A benchmark allowance of 18.5% has been included for fees and survey costs. This includes for all principal designers but also the specialist designers such as acoustic and fire engineers, ecology and BREEAM consultants. Specialist advisors for the Health Board including the District Valuer, Vat advisor and audit services are included.

Non-works costs
IT budget reflects the SMART hospital aspirations for the future. An allowance of 1% of the Works Cost has been included for art. An allowance for other Non-Works costs has been included benchmarked against the Grange Hospital.

Decant accommodation is included only where necessary. Further details are included in the individual appendices. Where relevant to disposal options an allowance is included to make secure and provide hoarding around the existing hospital to prevent unauthorised access.

The equipment allowance is included as a percentage to reflect the potential equipment requirements for the building based on benchmark information.

An allowance of 10% has been included as a Contingency. No provision for Optimism Bias has been included in the capital costs. Vat has been included at the current prevailing rate of 20%. Vat reclaim has been included for all design fees to the new build option. Vat reclaim has been included for design fees and asbestos removal for the refurbishment option.

The capital costs have been costed at 4Q 2021 price levels with a forecast PUBSEC Index of 269. It is recognised that future adjustments to these costs will be made against the Business Case Reporting Index of 250.

Project Cost Summary with new build option at Withybush and Glangwili

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Bronglais	£7,983,400	£91,617,278	£125,814,206	£125,814,206	£125,814,206
Glangwili	£22,908,307	£209,695,262	£154,609,276	£109,629,338	£109,629,338
Prince Philip	£7,384,413	£101,468,319	£115,744,502	£108,508,837	£101,580,104
Withybush	£10,769,015	£169,915,802	£129,885,830	£99,926,924	£99,926,924
Urgent Plan Care Centre	N/A	N/A	£681,208,303	£736,867,456	£719,768,993
Community hospitals	£8,550,000	£81,630,000	£185,000,000	£185,000,000	£185,000,000
Total project Cost	£57,595,135	£654,326,661	£1,392,262,117	£1,365,746,761	£1,341,719,565

Project Cost Summary with refurbishment option at Withybush and Glangwili

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Bronglais	£7,983,400	£91,617,278	£125,814,206	£125,814,206	£125,814,206
Glangwili	£22,908,307	£209,695,262	£122,952,756	£97,208,628	£97,208,628
Prince Philip	£7,384,413	£101,468,319	£115,744,502	£108,508,837	£101,580,104
Withybush	£10,769,015	£169,915,802	£125,683,299	£121,240,438	£121,240,438
Urgent Plan Care Centre	N/A	N/A	£681,208,303	£736,867,456	£719,768,993
Community hospitals	£8,550,000	£81,630,000	£185,000,000	£185,000,000	£185,000,000
Total project Cost	£57,595,135	£654,326,661	£1,356,403,066	£1,374,639,565	£1,350,612,369

7.

The intended programme of work for the numerous Community schemes is not known at present. The cashflow reflects the opportunity to undertake smaller schemes earlier and that the larger schemes will be constructed later in the programme.

Project Cashflow Summary

New Build Likely Efficiency Scenario

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8. Risk Management

8.1 Project Risks and Management Strategy

The estimated capital costs are provided in response and in support of the Programme Business Case which is a high-level assessment of the order of costs to deliver the defined scope of works.

Given the current work stage, development of a detailed quantified risk assessment has not prepared. This will be a subject matter which is considered in greater detail as each project moves onto the outline business case stage.

Risks have been managed at Programme level capturing the strategic level risks. The main PBC includes these risks and their associated mitigation measures.

The estates options work has identified the following key risks relevant to design and progression of the delivery of the estates investment programme.

RISK ID & CATEGORY	DESCRIPTION OF RISK
1	Population growth & demographic change assumptions could have underestimated future demand.
2	Continued compliance with NHS national planning strategies
3	Continued compliance with non NHS national planning strategies
4	Miscalculating the opportunities and impact and/or resource requirements of projects
5	Failure of IT and digital capacity to deliver changes required to implement innovative healthcare services
6	Risk that the Programme Governance Framework is not sufficient to deliver the Programme.
7	Risk that appropriate project leadership and programme governance is not in place and that clear scope of each project is not defined.
8	WG funding approval not made available for business case progression
9	Capital costs under estimated leading to design changes
10	Revenue costs under estimated leading to design changes
11	WG cannot fund Capital Requirements of the Programme Preferred Options
12	WG cannot meet the funding timetable for the Capital Programme (years 1-9)
13	Lack of funding availability prevents the most efficient procurement and of projects.
14	Key project staff not funded and not in place / Capability and capacity of project staff.
15	Availability of appropriate external support/advice.
16	Sufficient level and quality of clinical engagement.
17	Lack of public buy in / support
18	Lack of political support - nationally.
19	Lack of political support – locally.
20	Policy changes
21	Organisational structural changes.
22	Failure to identify a preferred site for the new UPCH
23	Inability to acquire the site for the new UPCH in line with the agreed programme
24	Difficulties in securing planning approval for the projects
25	National, regional and local transport policies and infrastructure are not delivered in line with the investment programme
26	Delays in selection of suitable technical consultant teams
27	Late involvement of Contractor / SCP in business case work
28	Variation of different procurement routes
29	Inadequate information produced to inform outline business case design brief
30	Inadequate information produced to support outline business cases
31	Health Board cannot engage suitably or adequately in business case work
32	Scope creep and overdesign
33	Changes in design trends and/or regulations and guidance lead to increased costs e.g. decarbonisation
34	Chosen procurement route proves ineffective
35	Acceptance of suitable level of risk by contractor / SCP
36	Construction activity impacts upon clinical services or clinical services impact on efficient construction delivery
37	Delay on one site causes delay on other sites due to interdependencies

9. Design Strategies

9.1 Urban and Social Integration

The places in which we live and work contribute to and affect our health and well-being. The masterplan for the redevelopment of the HDdUHB estate should be based around a strategy for a well-connected public realm which encourages social interaction and benefits people’s health and wellbeing through good design and space planning.

The new and existing hospital campuses should create coherent places which are embedded in the fabric of their local environment. They should be a good neighbour to their surrounding communities with buildings of appropriate scale and massing, clarity of form and a hierarchy of public and private areas. The introduction of community facilities which offer a broad range of accessible services will assist with social integration and support equality of access.

The sites should create an attractive and multi-functional public realm which is designed around the people who use the facilities and is attractive all year round. A well-considered public realm will help enhance the identity of the various hospitals and community facilities and support a clear wayfinding strategy based around improved public space and connections to new and existing buildings.

Proximity to green space has a direct influence over people’s activity levels and the masterplans should consider effective and attractive landscaping. Research shows that in residential areas with high levels of greenery, physical activity was over three times higher and this has demonstrable health benefits such as reducing the need for medication and lowering levels of obesity.

Promoting healthy and sustainable transport options helps to prevent the negative effects of current transport patterns on human health, such as air pollution, noise, and physical inactivity & divided communities. The masterplan should promote sustainable transport and provide opportunities for active travel, encouraging people to be physically active and contributing positively to lively and sustainable communities.

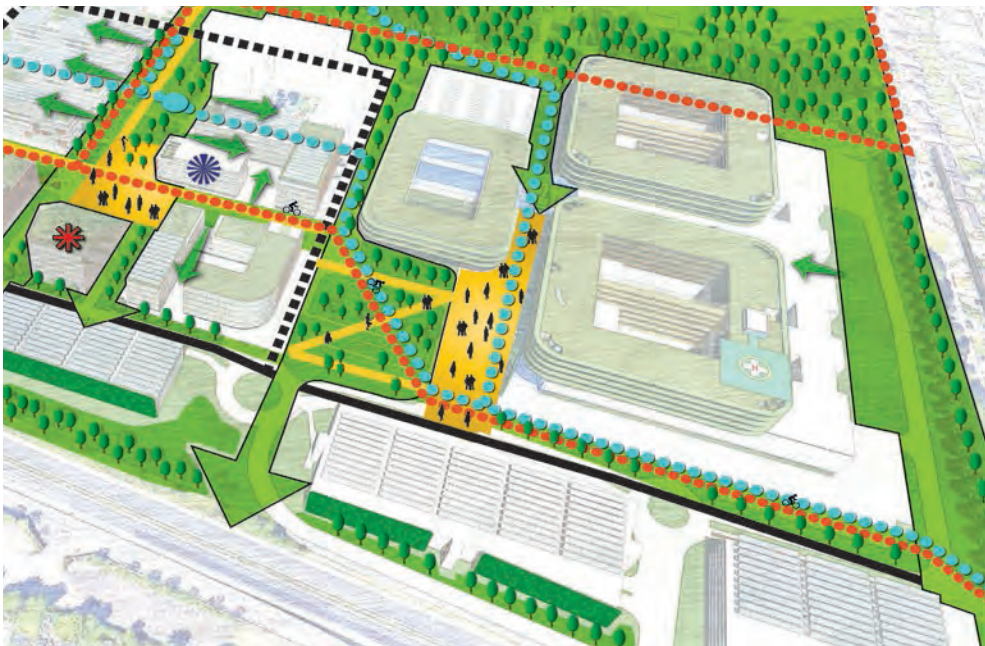
There should be a logical & legible network of routes through the site(s) and the masterplan should promote healthy and active behaviours, encouraging pedestrians and cyclists by providing dedicated routes and facilities such as secure cycle parking, staff changing facilities and voucher schemes for walking and cycling equipment.

We recognise that many people arriving and leaving hospital will need vehicular access and sustainable transport measures should include reserved parking for car sharers, electric vehicle charging points, well located drop-off zones and voucher schemes for public transport.

The masterplan should encourage efficient use of resources such as land, water and energy. New and refurbished buildings and infrastructure should be planned around the need for resilience and adaptability. Consideration should be given to combined energy networks and harvesting of waste energy to help reduce emissions and improve air quality.

An integrated system for the creative management of surface water and drawing can help alleviate pressure on mains networks and reduce flood risk as well as helping to create a beautiful and sustainable campus.

The masterplan should also incorporate an integrated strategy for public art. Campus wide arts trails inspired by local heritage and ecological features can make a powerful contribution to the health and well-being of users and residents. Creating access to arts opportunities and stimulating environments can also counter inequalities and increase social engagement.



9. Design Strategies

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9.2 Patient-centred Design

Patient-centred design is a concept which emerged in the late 20th Century and recognises the importance of a focus on patient needs in the healthcare environment. It is often considered as an alternative to a very functional driven approach to healthcare design which focuses on treatment of a disease or condition as opposed to treatment of an individual, but in reality the two need to be balanced against each other for a successful outcome.

At a very simple level patient centred design means putting the patient at the heart of the care process. It requires a partnership between staff, patients and their families to ensure that decisions are made that respect an individual's needs and preferences and to ensure that individuals have the information and support they need to make these decisions.

Key considerations for a patient centred design approach include layout, decentralised nursing and family centred care but these must also be considered in the context of multiple other factors such as environment, energy use, staff requirements and financial pressures.

The physical layout of the Hospital or departmental has a major impact on patient experience and clients and design teams need to consider factors such as accessibility, ease of wayfinding, travel distances and visibility of staff. Other factors such as standardisation of rooms and accessibility of clinical supplies have a less direct impact on patient experience but can influence the quality of care which staff are able to provide.

Decentralised staffing models can increase the level of time clinical staff are able to spend with patients as well as reducing walking distances and improving efficiency. If a patients is aware that a member of staff is working nearby it can help to reduce stress and anxiety. However a fully decentralised model can lead to a feeling of isolation for staff and teams should explore the integration of communication technology at an early stage to help address these concerns.

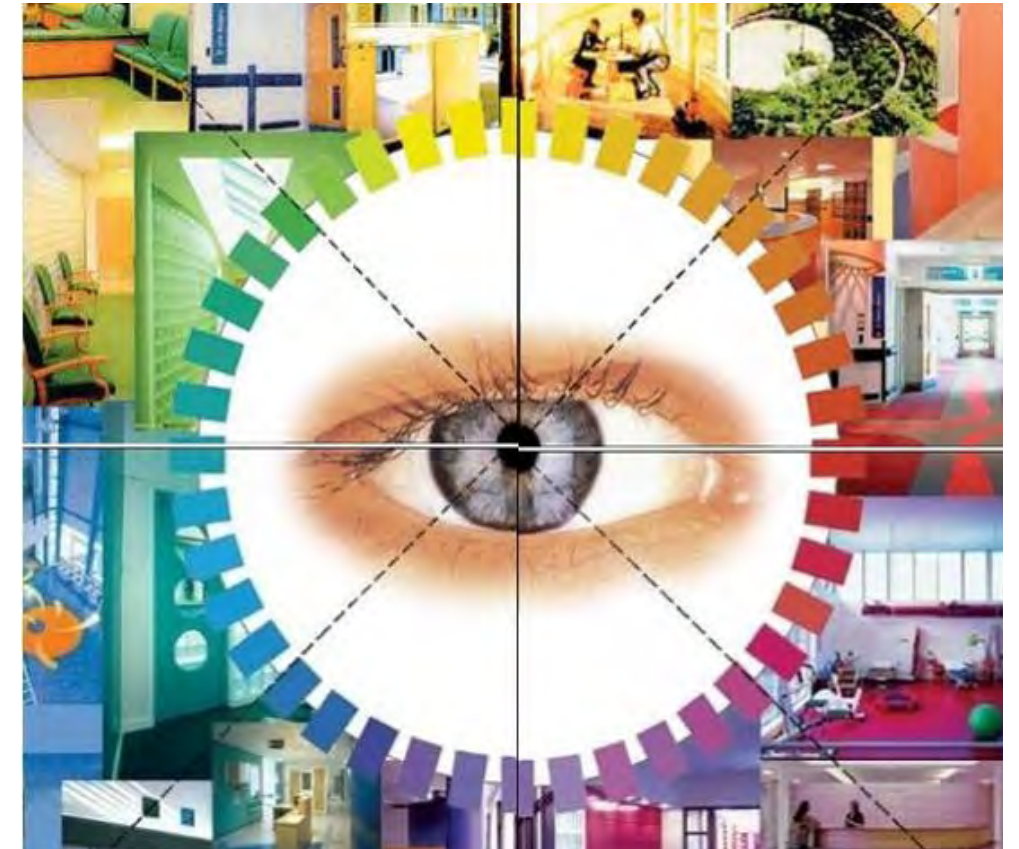
The important role of the family in patient care has become more prevalent in parallel with the increase in the use of single bedrooms. Creating space where family members can engage in the care process and where they have a feeling of independence, privacy and dignity is an important component of patient centred design.

Aligned with this is the ability for patients and their families to control their environment. The use of scientific evidence in the healthcare design process has become more widespread in recent decades with a focus on how environmental factors influence patient wellbeing. The ability to access natural light and ventilation is proven to enhance patient experience, and at the same time it has been proven how the impact of loud noises and smell can have a detrimental impact.

To deliver a fully patient centred experience clients and design teams need to take into account the amount of environmental control offered to patients and their families, with consideration for natural ventilation and daylight, access to external spaces and even control over sounds and smells within their immediate surroundings. This approach needs to be assessed in the context of sustainability targets and teams will need to balance the benefits against the potential costs in terms of energy use and emissions.

Another key contributor to the quality of patient experience is building design and in particular scale, massing and materiality. Hospitals are often large buildings and it is important to consider how the built form is broken down to human scale and how internal and external spaces interact to create a therapeutic environment. The use of artwork, intuitive wayfinding and interior design also work together to create a cohesive experience. Adjustments in colour, texture and the intensity of light can support the creation of a more patient focussed environment.

To deliver patient centred design means engaging with patients and their families during the early stages of the design process in order to establish their needs and wants. Design visioning workshops can be a good way of gathering a cross section of opinions from staff and patients and to explore broad themes such as the look and feel of the hospital, materiality, artwork and patient pathways.



9. Design Strategies

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9.3 Staff Attraction and Retention

The recruitment and retention of clinical staff is one of the most significant issues facing healthcare worldwide and is only likely to get more challenging as the demand for health services grows to meet the needs of an aging population. Inadequate staffing has an impact on job satisfaction and patient experience and creates health & safety issues. Staff shortages also create a significant financial risk to NHS organisations as the cost of staff turnover is estimated at around 150% of an individual's salary.

Research has identified a number of factors which affect staff satisfaction and productivity including the design of their physical work environment. Efficient and effective and functional workplace design allows clinical staff to deliver the highest quality of care to patients and the quality of their internal environment is often seen as a symbolic representation of their value to the organisation.

Attracting and retaining the best staff is not a simple problem to solve as staff satisfaction is influenced by a number of complex interrelated factors but the three key elements of workplace design which most significantly affect clinical staff are space, proximity and the quality of the internal environment.

Space is a precious commodity and regulations and standards provide guidance on how much space is required to perform key functions, but as models of care change the spatial requirements also change and often faster than the guidance can keep up. The challenge for designers is to create flexible spaces and create the ability for staff to adapt their environment to respond to new ways of working.

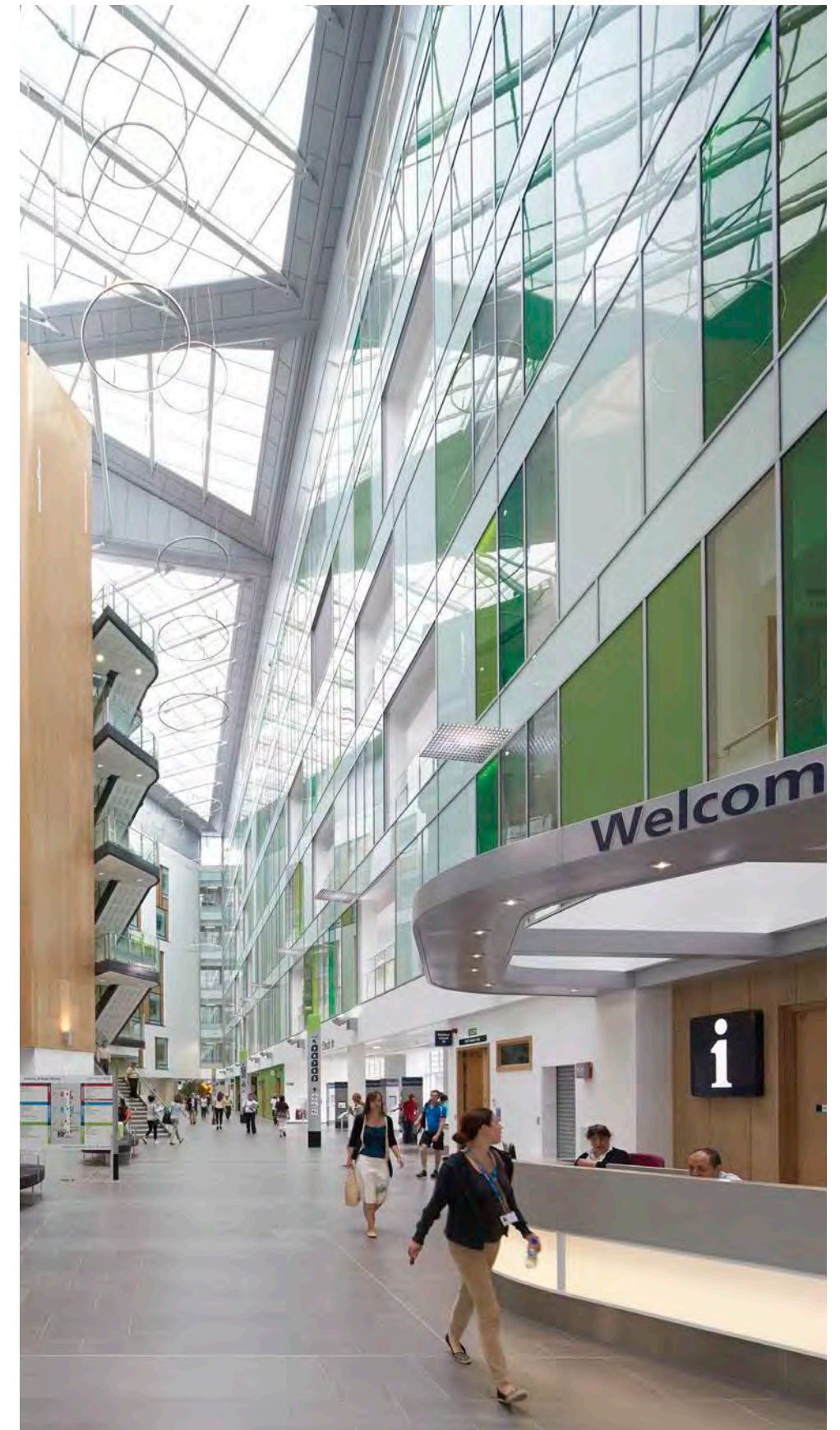
Proximity is important to clinical staff, whether to colleagues, supplies or other spaces. It is essential to provide efficient connectivity, both visual and physical to optimise lines of sight and walking distances. Prompt access to equipment in an emergency can be critical and maintaining observation over patients can help reduce falls but often this needs to be balanced alongside the competing need for additional space.

It is well known that indoor environmental quality impacts wellbeing, but hospitals are so often the opposite of the spaces we aspire to create. Long corridors, poor daylight, increased noise levels and unpleasant smells are all factors which influence our perception of a hospital. For staff the quality of the environment serves as a daily reminder of the value their employers place on their work.

Environmental factors which contribute to staff attraction are generally related to physical appearance including the quality of the main entrance and shared spaces. Clarity of wayfinding, accessibility and proximity to amenity space are all important to staff as well as natural light, colour and material use.

Factors which influence staff retention are more aligned to workplace efficiency and effectiveness including departmental layouts, space allowances and lines of sight. The ability to easily clean and maintain the environment is also key as well as sensory factors such as access to natural light and fresh air and the ability to control temperature and noise levels.

Good design takes time and effort from all parties. An inclusive design process coupled with a strong organisational culture can positively influence the effectiveness and longevity of a workplace's design, and improve staff attraction and retention.



9. Design Strategies

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9.4 Agile Working Strategy

Agile working practice focuses on allowing people and organisations to find the most appropriate and effective way of working to carry out a particular task. It recognises that work is an activity and not a place and a successful agile working strategy brings together people, process, technology, time and space to define how and when we work.

In March 2020, the COVID-19 outbreak necessitated a rapid switch to home working for a significant number of healthcare staff across Wales. As part of an initial review of the response to the pandemic, NHS Wales recognised the potential to learn from this initial response and to develop guidance on future agile working practices across the estate in a sustainable and planned way.

Although for many NHS organisations the shift to a more agile working model was already part of a longer term strategy there were many barriers to success including investment in digital infrastructure, changing accommodation requirements and possibly most importantly the significant shift in working culture. The pandemic required a quick response and broke down many of these barriers demonstrating the benefits that agile working can bring to the organisation and to the individual.

However as we move into the post-covid era there is risk that many organisations transition back to previous ways of working, losing the potential long term benefits.

The Health Board needs to reflect and learn from this experience to ensure that effective practices are maintained and begin the transition to a more sustainable long term agile working strategy.

In late 2021 the Health Board appointed a specialist consultant team to review its current working practices and help develop an agile working strategy which can be implemented across all of the projects affected by this Programme Business Case.

The change process is focussed on three key areas, people, property and technology.

For Health Board staff the aspiration is to deliver a better work/life balance, improved working environments and encourage collaboration. Staff recruitment and retention should benefit with people able to operate more flexibly, independently and with reduced commuting times which will help reduce the Health Board carbon footprint. Patients will also benefit from clinical staff being more mobile and able to provide care closer to home.

Property must be fit for purpose, multi-functional and efficient. The strategy should help to de-clutter existing sites, and reduce the overall estate footprint and revenue costs, while improving the working environment for those who are working 'on site'.

Technology must be fit for purpose with the right equipment in the right place at the right time. A mix of fixed and mobile equipment will allow staff to login from anywhere within the estate or remotely. Mobile clinical equipment will also allow staff to monitor patients at home which could reduce the requirement for inpatient beds.

Alongside the benefits there are certain risks to making the shift to agile working and these will need to be carefully managed in order to deliver a successful strategy. Some of these challenges relate to technology, cost and compliance with appropriate legislation however the greatest challenge may be supporting staff through the complex change management process.

The Health Board must recognise that this is long term process and this Programme Business Case is just the start of the journey.



9.5 Flexibility in Design

The changing nature of models of healthcare, whether seasonal or over a longer period of time requires flexibility of infrastructure at both a micro and macro level. The NHS repose to Covid-19 has highlighted the importance of flexibility in healthcare environments and this will become an ever more important factor in the masterplanning of healthcare estates moving forward.

Micro level strategies for flexible infrastructure include designing loose fit spaces and consideration of buildings which can be easily adapted, transformed or converted.

Designing for loose fit involves the use of standard room sizes and layouts to allow spaces to be used for multiple purposes during a short time period. Experience shows that within a standard acute healthcare environment a set of 20 typical rooms can often cover more than 80% of the overall functional area, which not only offers flexibility in use but has demonstrable benefits to the design and construction phases.

Spaces designed for adaptability use the same basic premise as for loose fit but might also consider more permanent change to specific functions. Facilities designed for transformation will take this strategy a step further and consider the relocation of internal walls and doors, allowing spaces to expand and contract to respond to changing clinical requirements whether driven by population demographics or other factors.

Convertible space can accommodate changing functions through some construction, but reducing cost and time by anticipating future needs. For example, acuity-adaptable rooms can be designed to facilitate change from regular inpatient rooms to critical care rooms if they are designed with the appropriate clearances for medical equipment and the ability to access additional engineering services.

A rational approach to the structural grid is a key factor in the delivery of flexible spaces. The building structure should recognise the need for functional spaces to flex with consideration for regular structural grids, and the ability to adapt services infrastructure without significant building works.

For situations involving more fundamental uncertainty, a number of macro-level approaches to flexibility can be used such as designing in soft-space, shell space or consideration for planned future expansion.

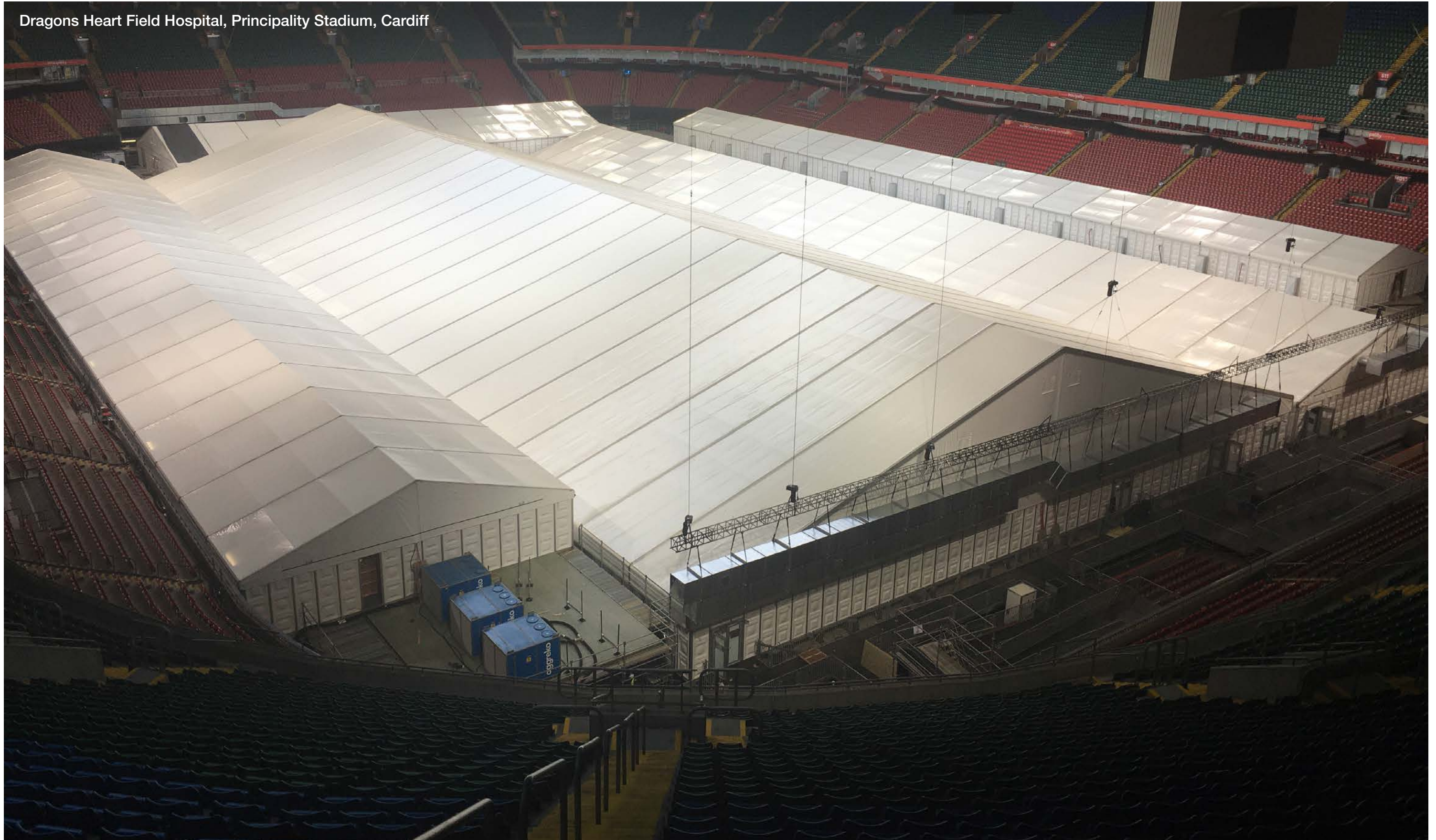
Soft spaces such as central storage and administrative offices can be designed adjacent to high tech clinical departments to enable them to expand in the future if necessary, with minimal upheaval and cost. Including unallocated shell space takes a similar approach and is beneficial when an expansion strategy is more clearly defined.

Consideration for future expansion is a critical element for any masterplan. Horizontal expansion can be facilitated through initial masterplanning and by providing circulation models that allow easy future growth for example hospital streets which are ‘open-ended’. Vertical expansion can be more expensive and requires up-front capital investment to include spare lift and engineering services capacity and will require the ‘overdesign’ of sub-structure elements as part of the initial build. Either option requires consideration of spare capacity in services infrastructure and distribution routes.

Key to success of any flexible design strategy is the approach to the engineering services infrastructure and consideration should be given to the installation of standardised primary vertical and horizontal plant distribution. Whilst potentially attracting a higher initial capital cost installing a standard primary distribution network of power, specialist gases and ventilation through risers and key services corridors allows for simpler future conversion or extension of clinical areas with minimal operational disruption.



Dragons Heart Field Hospital, Principality Stadium, Cardiff



9.6 Modern Methods of Construction (MMC)

Modern Methods of Construction (MMC) is a wide term, embracing a broad range of offsite manufacturing and on site construction techniques that provide alternatives to traditional building methods and forms a key part of Government policy for future construction in the public sector. The policy seeks to address drawbacks of traditional construction methods which are often unproductive and constructed with little consistency in both design and construction methods. NHS organisations are now required to address the potential use of MMC at all Business Case stages providing appropriate design and construction advice from in-house project teams and external design and cost advisors.

Some of the key benefits of MMC include improvements in cost effectiveness, reduced on-site project time and higher quality outcomes. For example the use of off-site manufacturing means that components can be produced in a controlled environment to a high quality and to a predictable schedule. The subsequent reduction in site assembly programmes can help reduce the number of on-site operatives which helps to drive improvements in health and safety and reduce defects. MMC can also help to address skills shortages in the construction sector and reduce project risk associated with material and labour availability.

It is important that the potential for MMC is considered at an early stage in the design process. This will help to maximise the potential benefits which this approach can bring including reducing waste and emissions. Essential to this is the consideration of the potential for BIM and the development of a project specific BIM Execution Plan which sets the aspirations for a fully integrated design, manufacturing and assembly process.

MMC covers a wide range of manufacturing and construction techniques from fully completed factory build units, through volumetric modular construction and standardised components. The use of standard components and assemblies has become reasonably common place in the construction sector and the UK healthcare industry has adopted many standardised products and materials through its Procure 21 and 22 initiatives including door and ironmongery assemblies, sanitary units and even whole rooms such as shower pods.

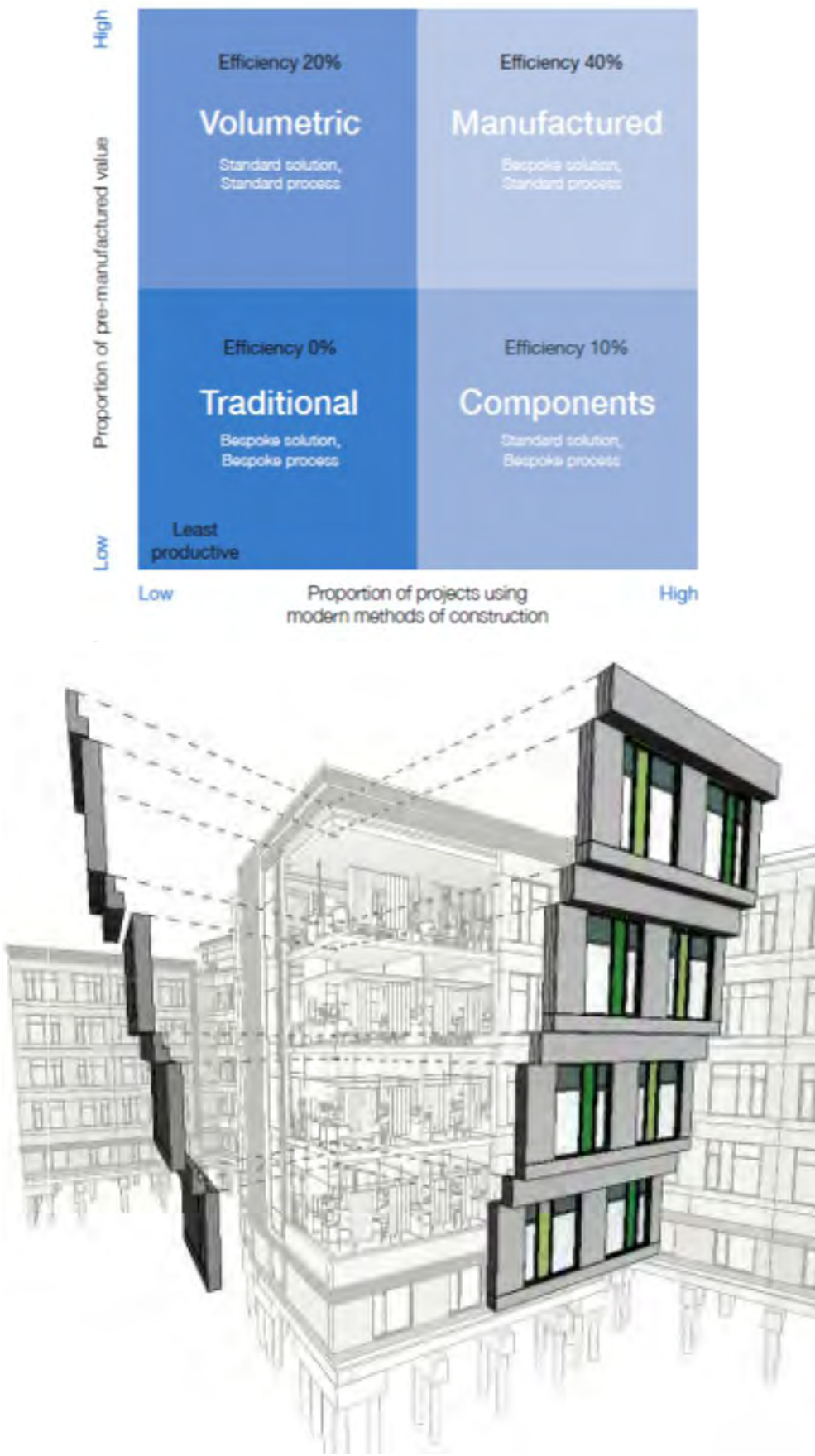
Volumetric construction involves the on-site assembly of factory finished ‘units’ which are substantially finished and don’t require any additional structure. This tends to be more suitable where there is repetition of spaces such as for inpatient wards or operating theatres.

The production of fully manufactured units via an off-site automated process offers the greatest opportunity to improve efficiency and productivity and reduce time on site. Units are designed and constructed as components in factory conditions and delivered to site as a kit of parts. This approach can enable high levels of customisation when combined with standard components and assemblies. A recent example is the construction of the Grange University Hospital in South Wales where BDP worked with Laing O’Rourke to design and deliver a 560 bed hospital using pre-fabricated building fabric elements which delivered a high quality consistent finish and a 10% improvement on the project programme.

In all scenarios the ability to maximise the use of off-site construction methods is limited by the ability to transport elements to site and restrictions relating to site logistics such as the use of cranes. This will influence decisions around the most appropriate opportunities for the use of MMC.

The adoption of Modern Methods of Construction varies from sector to sector and it is important that clients and design teams in healthcare explore lessons learned from other sectors such as education, residential and hospitality where the use of volumetric components and standard assemblies is more prevalent.

During the recent pandemic the development of the NHS field hospitals around the UK has provided a unique opportunity for the healthcare sector to explore the potential offered by MMC. At BDP we were involved in 6 major field hospital projects and worked with a range of designers, contractors and suppliers to explore methods which helped to reduce time on site, maintain quality and minimise risk. One of the key outcomes of our experience was the development of a field hospital design and assembly instruction manual which identified some of the key decisions for the early design stages and proposed a simple kit of parts which could be applied and adapted to any situation.



9. Design Strategies

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Early consideration of the use of MMC, allows the process to be streamlined through the design and construction process, maximising the benefits this approach can bring. Agreement to an early BIM Execution plan and sharing in a Common Data Environment (CDE) allows all parties to input in an integrated design, manufacturing and assembly process.

Some of the main advantages of MMC include:

Speed

One of the primary advantages of MMC in construction is the significantly reduced programme on-site through the use of prefabricated elements.

Lower assembly cost

By using fewer parts, decreasing the amount of labour required, and reducing the number of unique parts, MMC can significantly lower the cost of assembly.

Higher quality and sustainability

A highly automated approach can enhance quality and efficiency at each stage.

There may be less waste generation in the construction phase, greater efficiency in site logistics, and a reduction in vehicle movements transporting materials to site.

Shorter assembly time

MMC shortens assembly time by utilising standard assembly practices such as vertical assembly and self-aligning parts. MMC also ensures that the transition from the design phase to the production phase is as smooth and rapid as possible.

Increased reliability

MMC increases reliability by lowering the number of parts, thereby decreasing the chance of failure.

Safety

By removing construction activities from the site and placing them in a controlled factory environment there is the possibility of a significant positive impact on safety



Concrete Sandwich Panel ready for assembly at Grange University Hospital



Prefabricated steel trusses complete with roof finish and clerestory glazing for AstraZeneca

Grange University Hospital Site



9. Design Strategies

9.

9.7 Modern Methods of Construction: Engineering systems

Off-site manufacturing and modularisation of MEP systems are a key element in the delivery of an efficient off-site manufacturing strategy, elements of the MEP installation that could benefit from offsite manufacturing would include the following:

Mechanical and electrical risers can be built offsite and lowered into preformed risers utilising a crane. Risers would be manufactured utilising a steel support framing system upon which the services can be mounted. The frame system also serves as a guide into the preformed riser. Sections are normally manufactured in sizes that allow for ease of transportation from the manufacturing facility to the site.

Primary mechanical and electrical horizontal distribution can also be built offsite and installed, fixed to the soffit of each floor level. Secondary distribution can also be modularised, and this would be of particular benefit on floor levels where there is a lot of repetition such as inpatient wards and operating theatres. Similar to vertical modularisation, services are normally installed upon a steel support framing system which is then fixed to the concrete soffit. This type of system can be used to preinstall ductwork, certain types of pipework and containment.

Central plant and the connections to the primary distribution infrastructure can also be built offsite typically skid mounted and craned or wheeled into position before the building is made weather tight. Examples of central plant systems which can be prefabricated include;

- Wet service plant and pump assemblies delivered on skids ready for connection to distribution pipework.
- Packaged substations which could be lifted or manoeuvred into position.
- Fully fabricated air handling units with duct connections to be craned into the roof plantroom before the roof is constructed.

There is typically a cost premium involved in fabricating MEP systems off site, there is also additional design time required to achieve the granularity of co-ordination required for the services to be manufactured accurately earlier in the design process. However the delivery and installation of prefabricated services, if integrated within project programmes at an early stage, will result in significant benefits such as reductions in programme length, improvements in site logistics, reductions in site storage, reductions in the number of site operatives and a reduced risk profile.



9.8 Digitally Enabled Healthcare

Healthcare is going through a period of significant change driven by advances in medicine, pharmaceuticals and technology. In order to create a sustainable and resilient masterplan the development should consider the potential for future technological adaptations which will respond to advances in medical science and demographic changes.

- The masterplan should leverage information technology and other digital means to improve quality of life, user experience, efficiency of operation and services, whilst ensuring the hospital meets the needs of present and future healthcare. Examples of improvement include;
- Better and faster care delivery models through seamless integration of physical and digital infrastructure.
 - Technology used to accurately diagnose, treat, and deliver care
 - Stakeholders able to use information effectively and efficiently across the ecosystem
 - Staff job stimulation/satisfaction through better, faster learning and efficiency
 - Integration of BMS, the hospital's Command and Control Centre and wider ICT infrastructure to provide maximum inter operability, data harvesting and smart operations
 - Appropriate healthcare delivered at the right time and place;

- The feasibility stage is the most important opportunity for establishing a clear ICT brief. At this stage in the process healthcare organisations should engage with specialists to develop a digital road map maximising the potential benefits of new infrastructure and exploring opportunities to influence future operations. Future healthcare masterplans should consider the following four key digital elements;
- Smart Healthcare
 - Smart Buildings
 - Smart Mobility
 - Smart Estates

Smart Healthcare maximises the benefits of network technologies to improve patient and staff experience through enhanced communication, data collection, treatment planning, digital wayfinding and information services. Communication is a key factor in creating a smart healthcare environment and the use of mobile technology and tagging systems can help ensure that resources are available at the right time and in the right place.

Smart Buildings are based on integrating systems such as ventilation, lighting controls and energy management in a reliable and cost effective manner to optimise resource use, improve controls and reduce unplanned maintenance.

Smart Mobility refers to the promotion of faster, greener and cheaper transportation, which minimises journey times, reduces energy consumption and carbon emissions. It can also support individual mobility and accessibility through the use of smart transport applications and mobile technology.

A Smart Estate uses a virtual twin of a hospital site based on BIM information to improve data analysis and monitoring and to help predict problems, prevent downtime and reduce risk. This may also include the use of drones and robotics for building maintenance.

Focus on healthcare – smart hospitals



Family

Provide a safe and private atmosphere. Family gathering areas are warm and friendly, even providing healthcare education. Warm courteous environments, encourages open communication with staff. Ergonomically friendly in all areas, re-energizing relief areas.



Patients

Way finding, self-check in, Seamless communication and timeliness of services. Short travel distances and reduced confusion. A safe comfortable environment. Ease of getting to the care givers and vice a versa. Smooth transitions between services.



Healthcare Staff

Getting the staff and providers to the point of use is key. Clear lines of sight to see and communicate with staff. Things are where the providers need them, when they need them, every time. Staff has co-location or proximity locations to providers.



Medications

Medication is as close to point of use as safely possible. Med rooms strategically located to minimize staff trips for retrieval of medication.



Information

Staff and provider access to information and results is located at process areas. Visual management screens, kiosks, boards are located for ease of staff use and in many cases for the benefit of the patient as well.



Supplies

Supplies are at point-of-use (POU). Kanbans are in place and effectively run. Supply locations and replenishment periods are designed into the process flows.



Equipment

Equipment does not clog hallways and pathways. Equipment is where staff needs it, no searching, this can be designed into the layout.

Health Board Digital Vision

The Health Board have developed a vision for the hospital of the future articulated through the following case study which explores how digital technology might be integrated throughout a typical patient journey through the healthcare system in 5 years' time;

A virtual receptionist console welcomes Mr Jones and provides information on his appointment, the clinician he will be seeing and shows directions to his room. Mr Jones is automatically admitted to the hospital and a notification is sent to the ward staff to let them know he has arrived. This information is also pushed to his Hywel Dda app on his smartphone and using the pervasive Wi-Fi / 5G which he can use the navigation features in his app to move through the hospital to get to where he needs to go, via wayfinding. When he arrives at his room and settles in he is given a tablet so can we can login and view his personal health record, and the facilities of the hospital, e.g. Hospital menus etc. This information is stored securely on a cloud service, and on his record he can find out more about the professionals providing his care and when they will be visiting him as well as the procedure he is having and order his meals during his stay (which are delivered via the hospitals robotic infrastructure). He can also use his tablet to keep in touch with his family and friends on social media and video apps and use it to complete any information required for his stay in hospital such as updating his general health and how he is feeling along with family support available.

Mr Jones vital signs are automatically taken by sensors and others collected electronically by the nurses providing his care and this is used to automatically determine his current health and notify the clinical team of any abnormalities or concerns that need to be addressed. Various investigations are ordered electronically by the clinical staff using voice recognition such as Pathology and Radiology tests and the results are automatically populated in both the hospitals record and Mr Jones personal record. When Mr Jones had a query about a particular issue that was concerning him he could use the chat feature on his tablet and automated chatbots would answer the most common concerns about his procedure and ensure his clinical team were notified of concerns that could not be answered. He could also watch a 3-D video of his procedure to provide further information.

Mr Jones procedure went well and machine learning technologies enable the most suitable care plan moving forward which is electronically adjusted and signed off by the clinical team and Mr Jones. This is downloaded to his personal record and sent electronically to his GP. He now gets notifications when he needs to undertake actions associated with his care plan and his GP can keep an eye on how he is doing and contact Mr Jones if he feels he needs more support and help in undertaking any of these activities.

A district nursing team make a follow up visit to see how he is getting on and using the community care system they are able to see all the information about Mr Jones stay in hospital and using this system they capture post-operative assessments, images and video all of which are reviewed by Mr Jones consultant. His consultant spotting an area of concern arranges a video consultation with Mr Jones to discuss this and advise on suitable courses of action without the need for Mr Jones to travel and visit the hospital. Prescription medicine prescribed by the consultant are automatically delivered to Mr Jones house and his signature or biometrics are captured to ensure he has received the medication. His personal health record and Hywel Dda app will notify Mr Jones when he needs to take his tablets so he doesn't forget.

All the data captured from Mr Jones stay is anonymised and stored to the national data repository, cloud analytical technology enable learning to be extracted from his care and outcomes to improve future care plans for our patients



9.10 Route to Zero Carbon

The NHS zero carbon road map - Delivering a ‘net zero’ National Health Service – articulates the need to upgrade the entire ageing retained building stock across hospital sites. A key strategic decision needs to be made as to whether the masterplan tries to address the entire retained estate – including maintaining clinical services whilst all buildings are bought up to modern standards - or whether the masterplan keeps focus on key new builds, key major refurbishments and an upgrade of the centralised estates infrastructure.

Background

- By 2050 the UK government has committed to achieving Net Zero Carbon. There is an expectation that public building procurement will lead the way.
- The NHS accounts for c.5% of the UK’s carbon emissions
- Health Boards and other healthcare organisations are committing to Net Zero carbon by 2030.
- The typical design life of a healthcare building is more than 50 years
- All three local authorities (Carmarthenshire, Ceredigion and Pembrokeshire) have committed to becoming net zero by 2030

As such the proposals developed through this programme business case need to enable a net zero carbon future. Healthcare buildings are large energy consumers, characterised by long operating hours, large hot water loads and significant electrical equipment loads. This presents a significant opportunity for energy saving but also one of the largest challenges in delivering a net zero carbon solution.

A building’s carbon impact is defined by the ‘up front’ or embodied carbon associated with building materials, added to the carbon emissions from the energy consumed in the ongoing operation of the building over its life. To meet the Net Zero Carbon definition, steps need to be taken to reduce the emissions associated with these two stages to zero.

NHS and Zero Carbon

NHSI have recently released the document ‘Delivering a ‘net zero’ National Health Service’. The document provides a framework for the decarbonisation of all NHS activities ranging from Food and Catering to anaesthetic gases. The report identifies opportunities for emissions reductions in healthcare estates, with significant savings seen in the reduction of energy use in buildings, waste and water efficiency and new sources of heating and power generation. The report recognises that delivering a net zero health service will require work to ensure new hospitals and buildings are net zero compatible as well as improvements to the existing estate. TO support this a new net zero carbon hospital standard is due to be published in 2021. This will applied across the proposed HIP schemes in England but will be a useful benchmark for the masterplan.

We understand that the guidance will explore the use of innovative low carbon materials as well as designs which allow for flexibility and shifts in how healthcare is delivered. The document borrows heavily from the London Energy Transformation Institute (LETI) Guidance and stipulates;

- Embodied Carbon Targets for the new build construction
- Energy intensity targets for the new build operation
- Minimum BREEAM ENE01 targets to achieve

In line with this guidance, during the process of developing the business case in support of the Health Boards masterplan the following key opportunities will be explored;

New Build and Major Refurbishment

Energy efficient low carbon design principles should be adopted in the delivery of new build and capital refurbishment projects. These principles are described in the text below and should be embedded into the energy strategy, the business case proposals and any supporting design standards. All new build and major refurbishments should be designed to recognise net zero carbon standards (operational and embodied). It is important that when making strategic decisions between whether to build new or refurbish, embodied carbon is included as a determining factor.

Residual Retained Estate

The challenge comes in applying those principles to elements of the existing estate which are not subject to a major capital refurbishment (i.e. strip back to frame). The following text outlines the approach to dealing with working with existing infrastructure and retained estate which sits outside of the capital programme.

Decarbonising Existing Energy Infrastructure

We are still early in developing our understanding of the existing estate. If any of the existing estate is currently served by district CHP installations, a changeover may be required to 4th / 5th generation ‘balanced energy network’. The network could take a number of forms but in essence its purpose is to distribute energy at low/ambient temperatures (to minimise losses), share heat and coolth between buildings, facilitate the connection of buildings of different eras (using low and high temperature heat pumps) and support the connection of a number of zero carbon generation and storage nodes such as heat pumps, alternative fuel CHP plant, PV panels, wind turbines, thermal stores and battery stores.

Decarbonising Existing Retained Buildings

Whilst perhaps beyond the scope of this business case, as well as working with the existing infrastructure a further challenge for healthcare estates on the path to net zero carbon is the fabric performance and building services performance for buildings outside of the main capital spend. How these buildings are addressed will need consideration if the three sites are to meet the NHS challenge to be net zero carbon by 2030.

Decarbonisation of the Grid and Green Electricity Procurement

A key emerging trend that can be exploited by the Health Board to drastically reduce direct emissions is grid decarbonisation. Over the past decade, there has been a significant shift in the way electricity is being generated in the UK with the proliferation of embedded generation from renewable sources and the managed decline in the use of coal fired power stations.

Decarbonisation of the Grid

In the UK the electricity supply network is rapidly decarbonising, resulting in the rapid uptake of electrical heat generation technologies to capitalise on current and future carbon benefits. The national grid energy intensity figures are currently averaging at around 200 grams CO2e / KWh - past the carbon viability transition point from gas fired CHP to heat pump technologies.

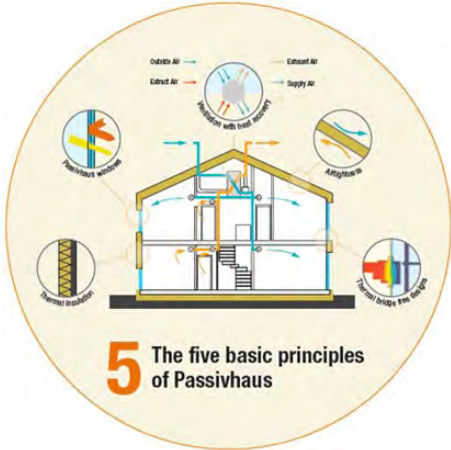
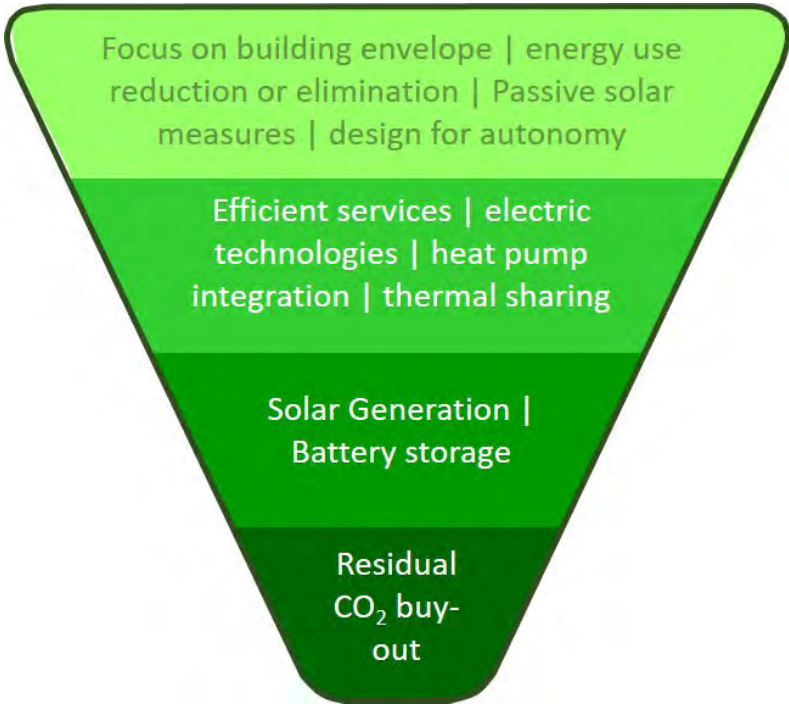
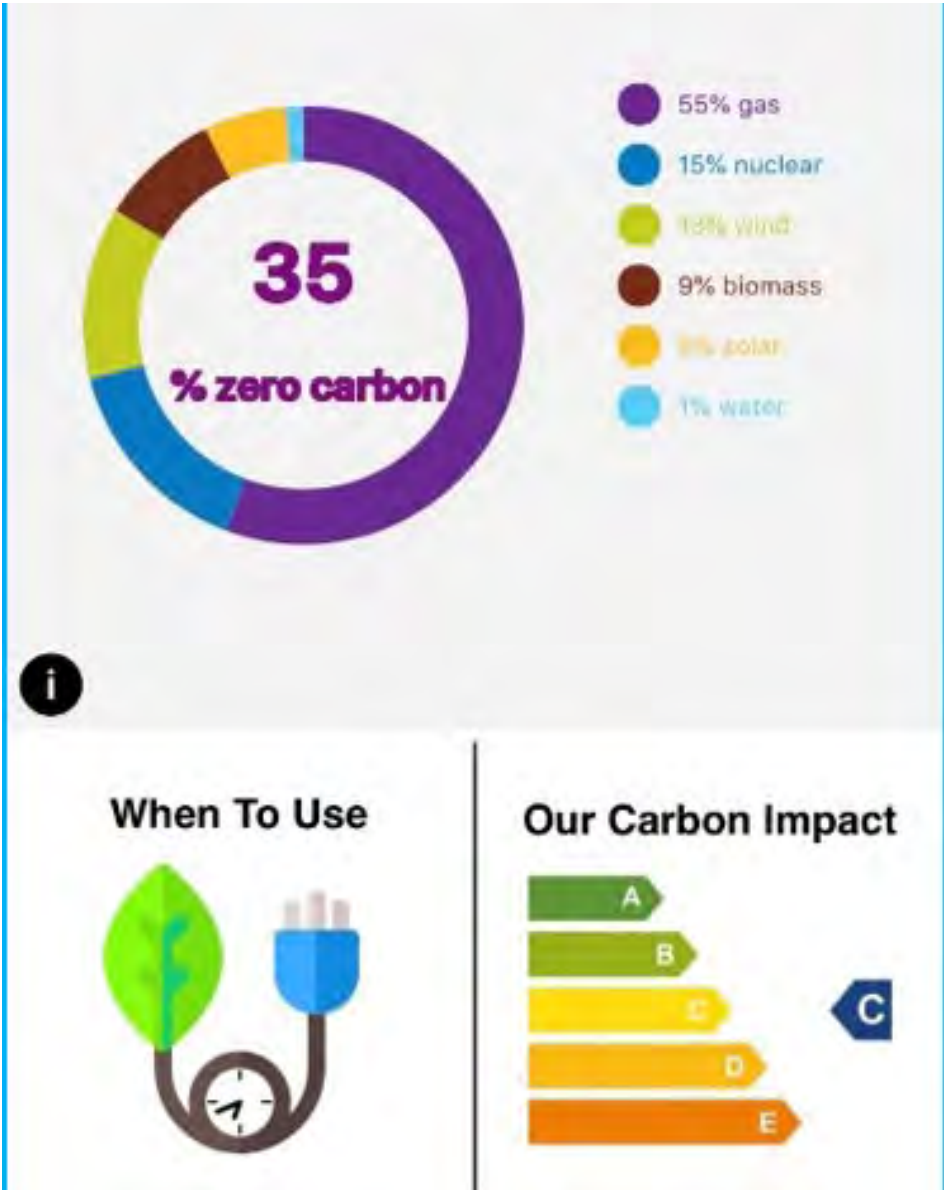
Green Electricity Procurement Commitment

At the same time the NHS Operational Plan 2020-2021 requires all NHS trusts to procure all electricity from renewable sources.

Electrical heating and cooling generation: It is likely that a decentralised electrically powered heat pump solution emerges as the most appropriate heating and cooling source to provide low carbon – and ultimately zero carbon energy – on the estates, although this needs to be tested through the business case.

Air Quality

A further benefit of an electrically driven heating and cooling strategy is that it emits no CO2 on site. It also has zero emissions of NO2, SO2 and particulate matter which is a key consideration in cities, which suffer from high air pollution.



Sustainable Development Principle



Sustainable Development

9.11 Transport

As part of the ‘Healthier Mid and West Wales’ clinical service strategy HDdUHB aims for all clinical services to be as accessible as possible for patients, visitors and staff. This includes designing transport services and utilising technology to reduce, whenever feasible, the requirement for the staff and members of the public to travel to hospital and community sites.

The Board are also aiming to deliver upon the ambitions of the Wales Transport Strategy (2021) by developing processes and services that encourage the use of active travel and public transport modes to all future sites. HDdUHB aims to work closely with its partners to develop a range of transport solutions that will complement a greater level of integrated treatment and holistic care, delivered as a part of the new clinical model.

This will include establishing services that facilitate transport demands in a timely and responsive way and enable greater engagement and collaboration with third sector providers. The Board will also seek to capitalise upon this opportunity to support the Welsh Government’s response to the climate emergency by developing and enhancing the transport service to support a significant reduction in CO2 emissions and meet the objectives set out within the NHS Wales decarbonisation strategy.

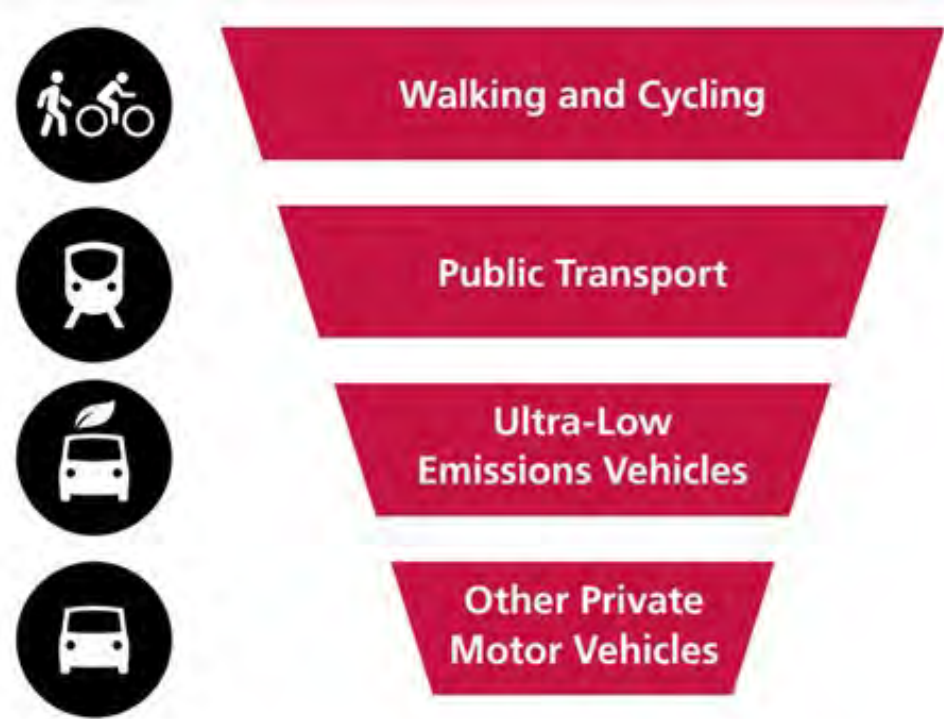
The Board’s aspirations relating to the future transport model cover a range of themes including emergency and non-emergency patient transport, staff journeys, visitors, decarbonisation, third sector links, active travel and parking. Each of these themes will need to be considered for individual projects moving forward but also the impact on the wider estate transport strategy such as considering inter-site patient transfers and staff mobility.

During the Development of the Programme Business Case the design team has utilised The South West and Mid Wales Transport Model (SWMWTM) to understand the travel times across the estate for different modes of transport. This information has been used to develop our understanding of the existing transport network and to inform decisions relating to the potential location of the new urgent and Planned Care Hospital. This has included consideration of future rail and bus improvements included in the Swansea and West Wales Metro programme.

The projects recommended within this Programme Business Case will provide an abundance of benefits, not only related to the health service, but may provide an opportunity for wider transport improvements, particularly around the active travel and public transport provision, in line with the Wales Transport Strategy user’s hierarchy.

Furthermore, improving the active travel and transport provision chimes with the carbon reduction agenda, which subsequently provides the health and environmental benefits to the wider society. During the next stages of business case development It will be important to work with partners such as Welsh Government and Transport for Wales, to ensure the potential transport interventions are considered and will maximise the benefits for the staff, patients and local communities.

- The next steps for the individual Outline Business Cases for each project will include the following:-
- Broader engagement with the stakeholders
 - Modelling of future transport demand across the estate
 - Mapping transport capacity to future demand
 - Investigating new transport services
 - Exploring opportunities for remote working and reducing the need to travel (linked to the Agile working strategy)
 - Integration of transport modes across the estate
 - Analysing potential decarbonisation benefits of different transport strategies





10. Compliance & Derogation

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10.1 Compliance & Derogation

The original project brief set out the requirement for the project team to ‘ensure that the project is compliant with relevant legislation and guidance (e.g. Construction Design & Management Regulations 2014 and NHS Design and all Technical Guidance (WHTM’s/ WHBN’s)’.

The briefing documents prepared by Strategic Health Partnership describe the functional requirements for each of the four existing acute sites and the new urgent & planned care hospital. The brief, although high-level at this stage, is based on all relevant Welsh Health Building Notes (WHBNs) and Health Building Note (HBN) guidance as published by NHS Wales Shared Services Partnership. A list of relevant WHBNs and HBNs is included below. The estates annex assumes that all new build facilities will achieve the appropriate level of compliance with these documents and associated design guidance.

For the refurbished facilities at Bronglais and Prince Philip, and for the refurbishment options at Withybush and Glangwili, as well as for the refurbished community sites it is unlikely that the design solutions will achieve full compliance with all relevant legislation. In this scenario the team developing the Outline Business Case proposals will be responsible for establishing a list of derogations from legislation so that the Health Board are able to appraise the benefits and drawbacks of any design solutions.

Where appropriate the appendices to this estates annex provides commentary on the potential for future derogations, for example at Bronglais Hospital where the constraints of the existing building will impact the potential to achieve both the space standards and the recommended proportion of single bedrooms in the inpatient wards areas.

The following is a list of relevant Health Building Notes extracted from NWSSP website January 2022;

WHBN 00-01: General design principles (2013)
WHBN 00-02: Sanitary spaces (2013)
WHBN 00-03: Clinical and clinical support spaces (2013)
WHBN 00-04: Circulation and communication spaces (2014)
HBN 00-07: Resilience planning for the healthcare estate (Welsh edition 2006)
HBN 00-08: Estate code (Wales edition 2009)
HBN 00-08: Estate code – Estate code supplement: Land and property appraisal and estate performance indicators (Wales edition 2010)
WHBN 00-09: Infection Control in the Built Environment (2016)
WHBN 00-10 Part A: Flooring (2014)
WHBN 00-10 Part B: Walls and ceilings (2014)
WHBN 00-10 Part C: Sanitary Assemblies (2014)
WHBN 00-10 Part B: Windows and Associated Hardware (2014)
WHBN 01-01: Cardiac Facilities (2017)
WHBN 02-01: Cancer Treatment Facilities (2017)
WHBN 03-01: Adult Acute Mental Health Units (2016)
WHBN 03-02: Facilities for CAHMS (2017)
WHBN 03-02: Case Studies (2017)
WHBN 03-02: Quality of Life Checklist (2017)
WHBN 04-01: Adult in-patient accommodation (2011)
WHBN 04-01: Supplement 1: Isolation facilities in acute services (2005)
WHBN 04-01: Supplement 2: Negative Pressure Suites (2018)
WHBN 04-02: Critical Care Units (2016)
HBN 06: Facilities for diagnostic imaging and interventional radiology
WHBN 07-01: Satellite dialysis unit (2011)
WHBN 07-02: Main renal unit (2011)
HBN 08: Facilities for rehabilitation services (2004)

HBN 08-02: Dementia friendly health and social care environments (2016)
WHBN 09-02: Maternity services (2013)
WHBN 09-03: Neonatal Units (2013)
HBN 10-02: Day surgery facilities (2007)
HBN 12-01: Out-patients department (2004)
HBN 12: Out-patients department Supplement 2: Oral surgery, orthodontics, restorative dentistry (1992)
HBN 12: Out-patients department Supplement 3: ENT and audiology clinics, hearing aid centres (1993)
HBN 12: Out-patients department Supplement 4: Ophthalmology (1996)
HBN 12-01: Supplement A - Sexual and reproductive health clinics (2008)
HBN 13: Sterile Services Department (2004)
HBN 13: Sterile services department Supplement 1: Ethylene oxide sterilization section (1994)
WHBN 14-01: Pharmacy and radiopharmacy facilities (2014)
HBN 14-02: Medicines Storage in Clinical Areas
HBN 15: Facilities for pathology services (2005)
WHBN 15-01: Accident and Emergency Departments (2016)
HBN 15-03: Hospital helipads (2008)
HBN 20: Facilities for mortuary and post-mortem room services (2005)
HBN 23: Hospital accommodation for children and young people (2004)
HBN 26: Facilities for surgical procedures: Volume 1 (2004)
WHBN 36: General Medicine Practice Premises (2017)
HBN 37: In-patient facilities for older people (2005)
HBN 44: Accommodation for ambulance services (1994)
HBN 52: Accommodation for day care Volume 2: Endoscopy unit (1991)
HBN 52: Accommodation for day care Volume 3: Medical investigation and treatment unit (1995)

10. Compliance & Derogation

10.



Examples of WHBN compliant room layouts

11. Next Steps

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11.0 AHMWW next steps

This estates annex provides high level options for each element of the programme. It is envisaged that the programme business case is endorsed, and funding released to enable each project to progress onto the outline business case stage during the summer of 2022.

During the period of PBC endorsement programme momentum will be maintained by the following key next steps:

- Contributing towards and responding to scrutiny queries
- Technical appraisal of the shortlisted sites proposed for the Urgent and Planned Care Hospital
- Liaisons with utility service providers and other statutory bodies to further inform site development viability and costs
- Test for fit exercise on each of these short-listed sites for the Urgent and Planned Care Hospital
- Transport and travel time analysis associated with the proposed new model of care as well as progression of strategies and policies to support sustainable travel solutions.
- Participation in the evaluation of the short-listed sites to confirm the preferred site for the Urgent and Planned Care Hospital
- Negotiations with landowners with the aim to secure an option to purchase agreement for the preferred site for the Urgent and Planned Care Hospital
- Liaisons with local planning authorities to develop planning strategy and establish the requirements for Environmental Impact Assessments on each of the short-listed sites for the Urgent and Planned Care Hospital.
- Support the Health Board and contribute to the development of design brief information for the outline business case stage for all projects.
- Ongoing support and updating of programme implementation and delivery timescales

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Hywel Dda University Health Board

A Healthier Mid & West Wales: Transforming our Hospitals Programme Business Case

Estates Annex: Appendix A Bronglais General Hospital

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Revision History

Rev	Date	Revision Description	Issued By	Checked By
Rev 0	17.01.2022	Issued for Health Board Review	SW	ND

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Bronglais Hospital

Bronglais Hospital

A

1.0 Description of the Hospital

Bronglais Hospital is located approximately 1km to the west of Aberystwyth town center on the A487 (Penglais Road) which leads towards Machynlleth to the North. It is the only acute hospital within mid-Wales and is the main hospital for the students of Aberystwyth University.

The site occupies approximately 4 hectares and is steeply sloping with a fall of circa 24m from east to west and roughly 3m from north to south. The site is bounded to the north by the busy Penglais road, to the south and West by low rise residential areas. To the East lies the main campus for Aberystwyth University and the National Library of Wales.

The original Aberystwyth Dispensary was founded in Great Darkgate Street in 1821. It was relocated to Upper Portland Street as the Aberystwyth Infirmary and Cardiganshire General Hospital in 1838. It was moved once again to Eastgate in 1858 and to North Road in 1888 where it remained until it became the Aberystwyth and Cardiganshire General Hospital in 1948. Following the demolition of the Aberystwyth Union Workhouse the hospital moved to its current location on Caradog Road in 1966.

The first phase of the new Bronglais General Hospital (Block 1) was completed in 1966 at a cost of circa £1.5m. At the time the hospital included circa 100 beds an accident and emergency department and an operating theatre. The 2021 EFPMS data shows that the current hospital has a gross internal area of 27,513sqm and key clinical functions include 155 inpatient beds & 10 mental health beds, an Emergency and Urgent Care Centre, diagnostic imaging, operating theatres, outpatients and mental health services.

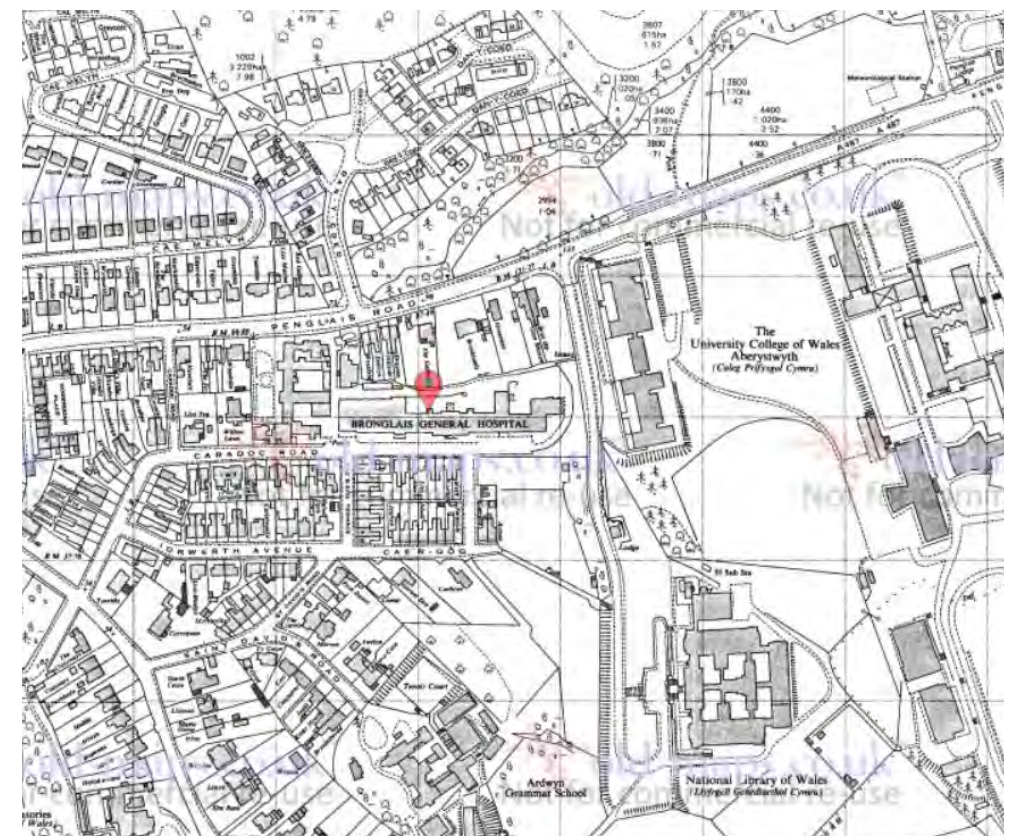
A comprehensive redevelopment project has been undertaken in the last 10 years including the construction of a new front of house scheme providing new Emergency and Clinical Decisions Units and dedicated Day Surgery Unit. The main operating theatres and pathology have also been refurbished as part of this work.

There are a number of ancillary buildings on the site including Post Graduate and residential blocks to the south east of the main buildings which constructed in the 1950s, a mental health unit on the northern boundary of the site which was constructed in the 1980s, A modular day theatre block constructed in 2007 and a

number of Victorian houses which are now used as offices. The original 1960's buildings – blocks 1 and 2 are generally constructed from exposed concrete frame, render, brickwork and powder coated aluminium windows which are nearing the end of their serviceable life. The render cladding has been highlighted as a fore risk and the buildings generally have been identified as needing an upgrade to improve thermal performance. There are some areas of stone cladding on blocks 1 and 2 and it is understood that there is evidence of corrosion in the supporting framework. The flat roof to block 2 was replaced as part of the recent upgrade works but the flat roof to block 1 requires a similar upgrade.



Bronglais Hospital from Caradog Road



Bronglais Hospital Site layout 1968

Bronglais Hospital

A

There are known statutory compliance issues with the hospital including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. Some further fire safety improvements are required to blocks 1 and 2 including repairs to compartmentation, fire doors and improved emergency lighting. It is understood that most compliance issues would be dealt with as part of future refurbishment works.

Most of the internal spaces and layout are reflective of the timing of the construction in the early 1960's and much of the internal layouts in Blocks 1 and 2 are no longer suitable for the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity increases infection risk and makes safe manual handling more difficult to achieve. A lack of sanitary facilities for staff and patients as well as insufficient spaces for private conversations have been highlighted as critical areas for improvement.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update electrical infrastructure, nurse call and bed head services in the original buildings. A number of major plant items were also identified as being 'end of life' including LTHW boilers, chiller plant and a number of AHUs. Building Management Controls and external lighting were identified as needing further investment and it is understood that the heating infrastructure is nearing end of life and may require replacement.



2.1 Site: Massing

Bronglais Hospital is located to the west of Aberystwyth town center on the A487. The site occupies approximately 4 hectares and is steeply sloping with a fall of circa 24m from east to west and roughly 3m from north to south. The site is bounded to the north by the busy Penglais road, to the south and West by low rise residential areas. To the East lies the main campus for Aberystwyth University and the National Library of Wales.

The site has a compact footprint and is mostly occupied by buildings, roads and footpaths, with only small packets of landscape around the mental health block and along the northern boundary where a large retaining wall separates the service road from the mature trees at the higher level.

There are a number of vehicular entrances to the site along Penglais Road. To the west the change in site levels provides the opportunity for two separate entrances one of which offers access to the emergency department and lower car-park level, and the other access to the newer front of house block and upper car-park. A third junction provides access to the mental health block and short stay ward. The main entrance between Blocks 1 and 2 is accessed via Caradog Road which runs along the southern boundary and wraps around the north of the site to create a service access road.

Buildings on the site range in age from 1950's through to the modern day. The original two and three storey residential blocks to the South East of the site are the oldest buildings. Blocks one and two range from 4 to 6 storeys as individual buildings but due to the sloping site there are 10 building levels across the estate. The newer front of house block is 3-4 storeys and is located at the Western edge of the campus which is slightly flatter than the rest of the site.

The facades of the original buildings are a mix of exposed concrete frame, insulated render and brickwork with aluminium windows. Much of the façade is the end of its life with issues around water ingress, fire safety corrosion. The flat roof over block 2 was replaced during the recent upgrade works however the roof over block 1 requires similar replacement. Buildings constructed within the last 10 years are in good condition.

LEGEND

Red Line Boundary



Site Plan - Figure Ground

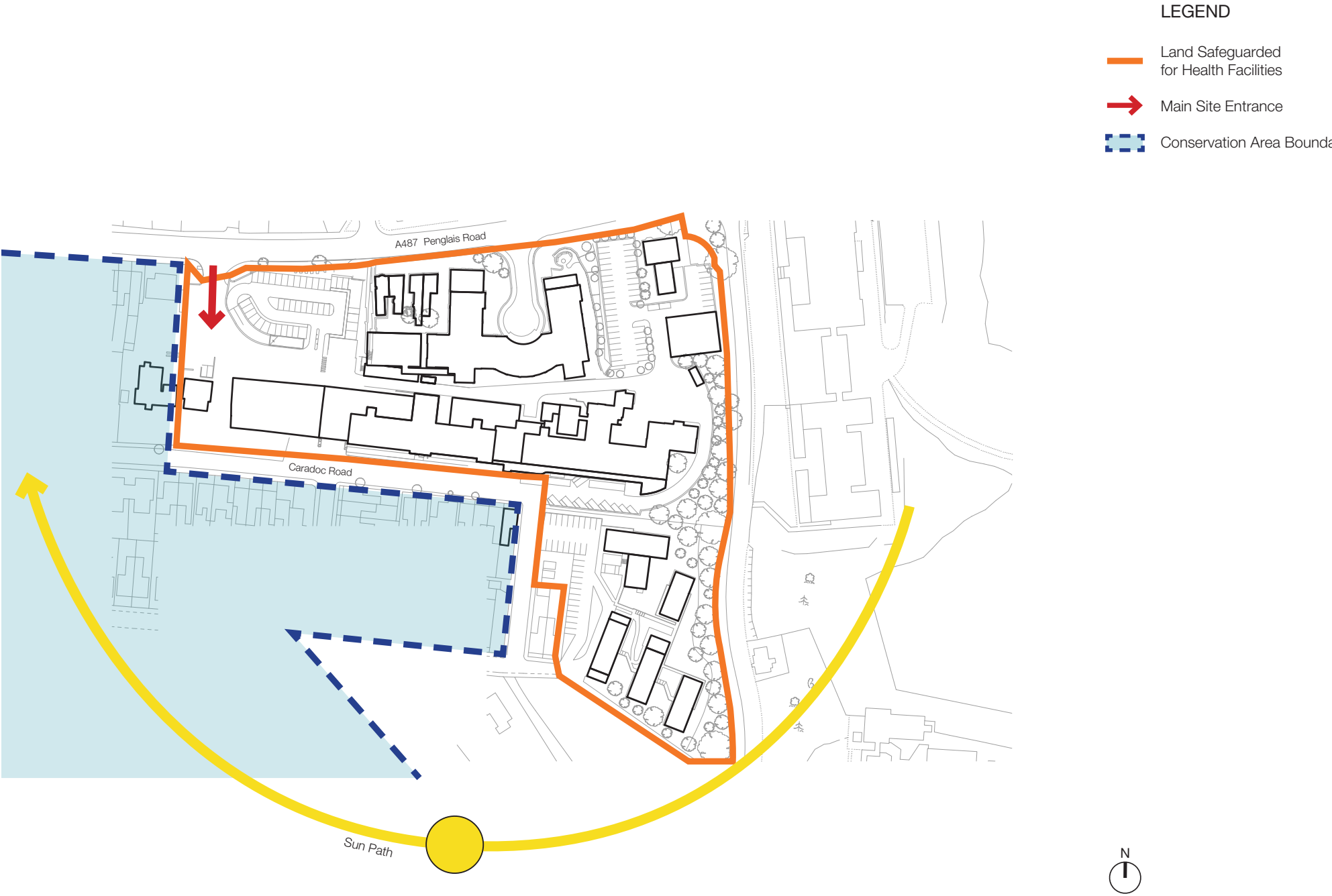
2.2 Site: Urban Context and Planning

Bronglais Hospital is located approximately 1km to the west of Aberystwyth town centre.

The site is characterised by a steep slope falling roughly 24m from east to west. Areas to the north, South and west of the site are characterised by low rise residential which form parts of the Aberystwyth Town Centre Conservation zone, the boundary of which follows the western and southern boundaries of the hospital site.

Ceredigion County Council has been consulting on an update to the current LDP which is due to expire in 2022 although due to the current coronavirus pandemic the consultation process has been suspended.

There are currently no listed buildings or tree preservation orders on the site.



Site Plan - Planning

2.3 Site: Clinical Zoning

Clinical services provided at Bronglais Hospital include;

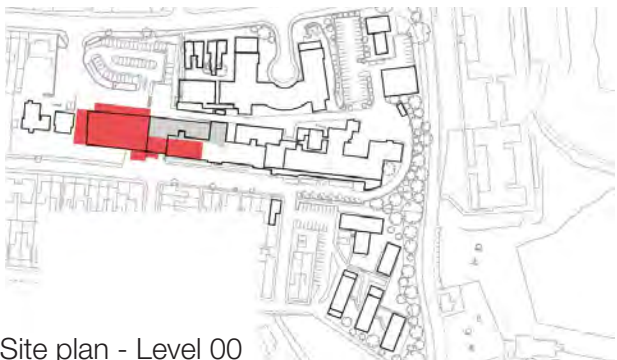
- Accident & Emergency
- Diagnostic Imaging (X-ray, MRI)
- Planned care
- Unscheduled care
- Ambulatory care
- Surgery
- Paediatrics
- Midwifery

The hospital also includes inpatient wards with 162 inpatient beds covering the following specialities;

- Respiratory and Acute Medicine
- Cardiology (Cardiac Monitoring Unit)
- Oncology & Acute Medicine
- Stroke & Acute Medicine
- Surgical/ Gynaecological
- General Surgery
- Orthopaedics
- Clinical Decision Unit & AEC
- Intensive Care (ITU)
- Maternity
- Paediatrics

The latest Data Report confirms the overall gross internal floor area as 27,531sqm

Clinical adjacencies are highlighted in the adjacent floor plan diagram and on the following pages.



2.4 Access and Movement: Site Access & Parking

There are a number of vehicular entrances to the site along Penglais Road. The road follows a one-way route in a clockwise direction exiting the site at the south onto Caradoc Road.

Car parking is concentrated in a few small areas distributed around the hospital site, alongside the main departmental buildings. Parking to the North East and to the South is on-grade. Parking to the North is in a two deck car park outside the new front of house building and accessed directly off Penglais Road.

The latest Data Report indicates that there is a total of 236 parking spaces available, of which 24 spaces are designated disabled parking spaces and 98 are allocated for staff. Parking at the Bronglais site is a challenge and a park & ride system for staff has been in use over recent years.

LEGEND

Existing Staff Parking

Existing Public Parking

Parking for Others

Vehicular Routes



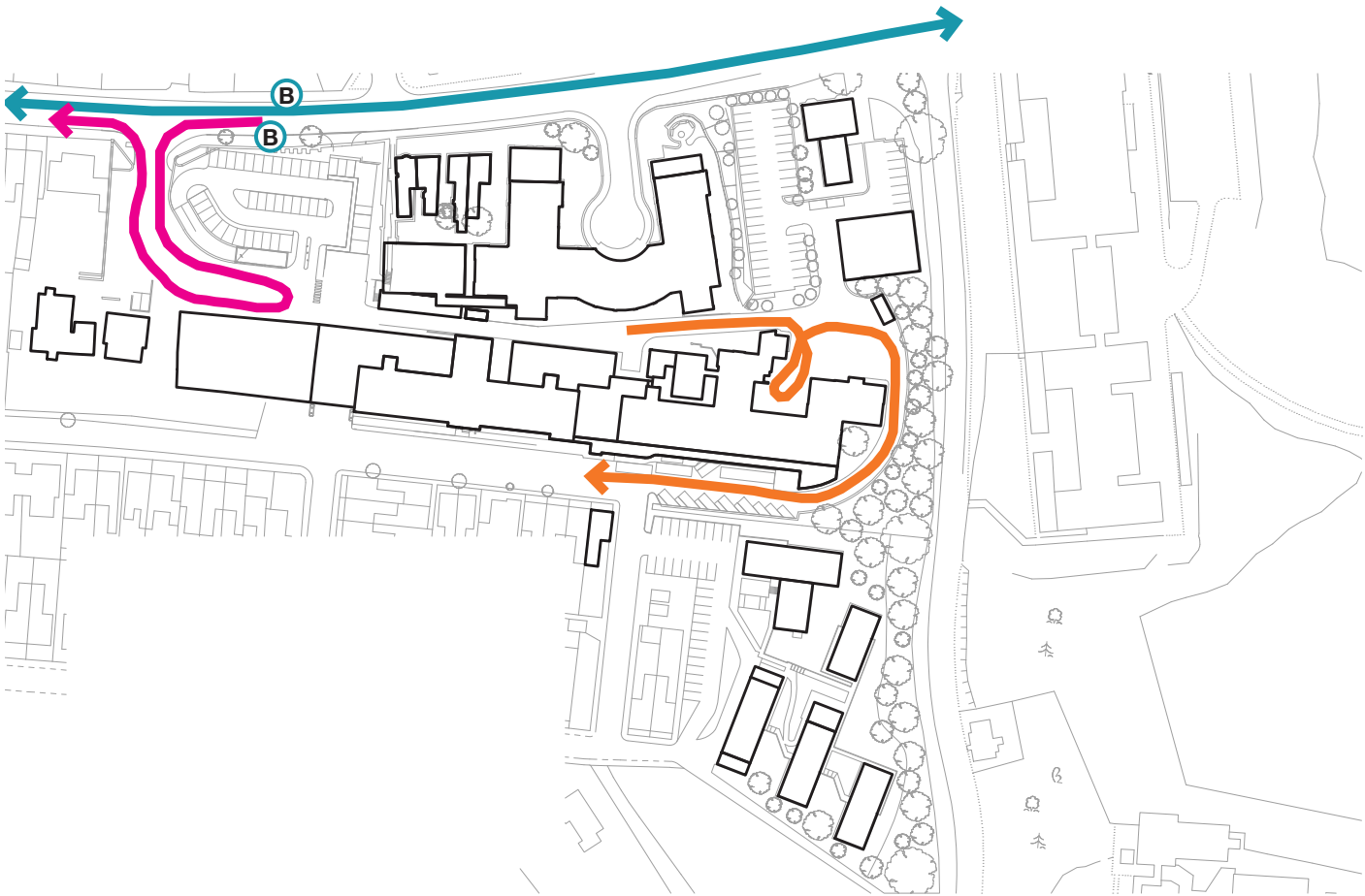
Site Plan - Car Parking

2.5 Access & Movement: Emergency & Service Access and Public Transport

The Emergency Department at Bronglais is located at the western end of the main building within the new front of house block. The ‘blue light’ access route to the Emergency Department is provided to and from Penglais road. A turning head outside the Emergency Department enables emergency access only against the one-way flow of general traffic on the hospital ring road.

Service access to the site is designated off Penglais Road and follows the one-way flow to the East side adjacent to the Block 1, which connects to the main hospital street. A designated goods parking area and turning head are provided within this undercroft area. The service route exits to Caradog road at the south of the site.

Bus services to the site pick-up and drop-off on Penglais road located adjacent to the deck car-park. No bus services come onto the hospital site.



- LEGEND
- Bus Routes
 - Bus Stops
 - Existing ‘Blue Light’ Route
 - Existing Service Route



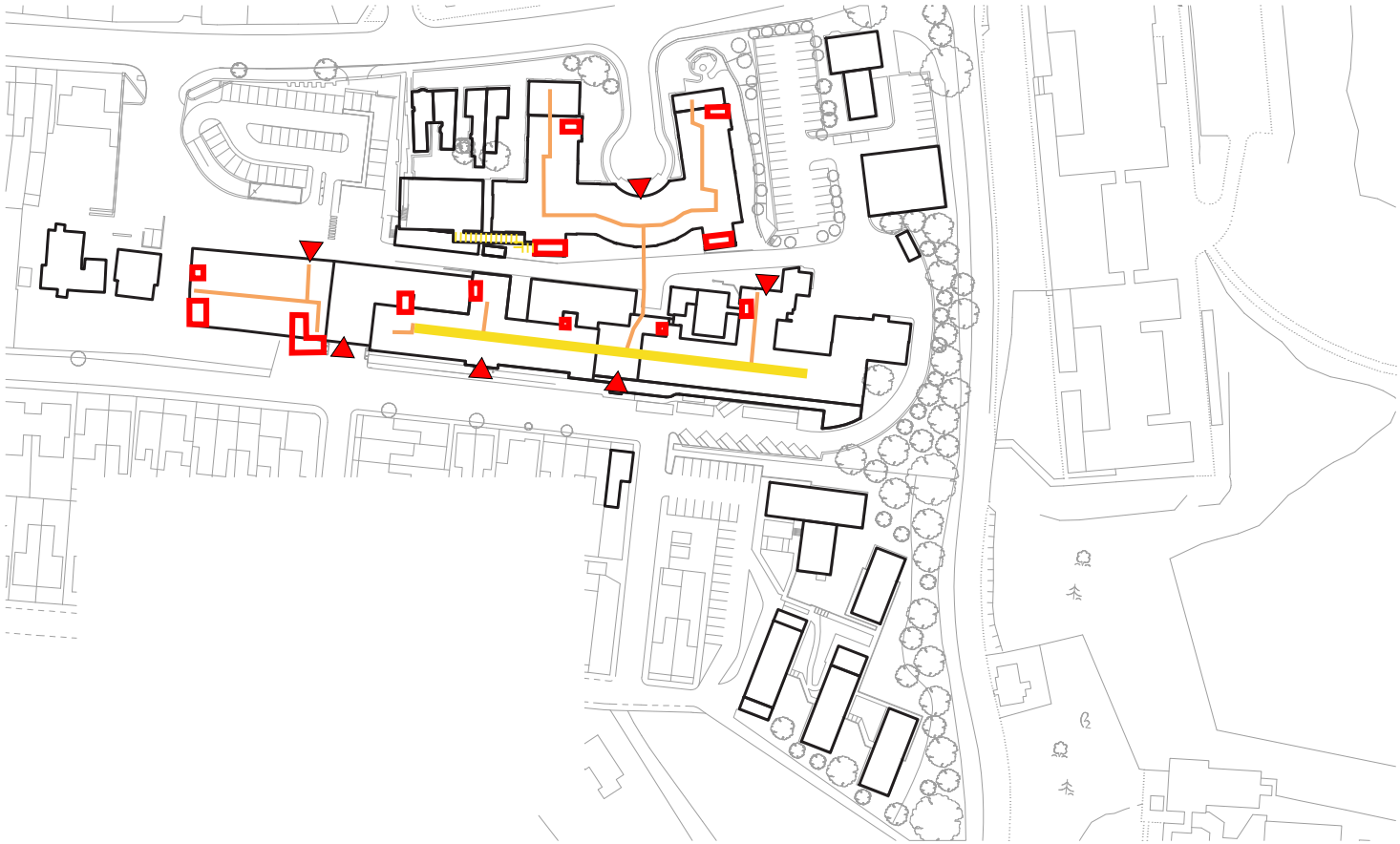
Site Plan - Public Transport and External Circulation

2.6 Access and Movement: Internal

There are various access points around the perimeter of the Bronglais building providing access to specific departments. The main entrance concourse however is accessed on the south boundary facing Caradog Road, and from here you can access the main hospital street which runs in an east-west direction and connects the various buildings including the inpatient ward building which faces Penglais Road.

Individual corridors and vertical circulation cores branch out from the hospital street into the individual departments across the 8 levels.

- LEGEND
- Hospital Street
-
- Internal Circulation



Site Plan - Internal Movement

2.7 Existing Estate Condition

Hywel Dda University Health Board owns and leases building which range from 19th Century to modern day with varying degrees of functionality, condition and performance. 36% of the estate is over 50 years old and at Bronglais this percentage is nearer 62%.

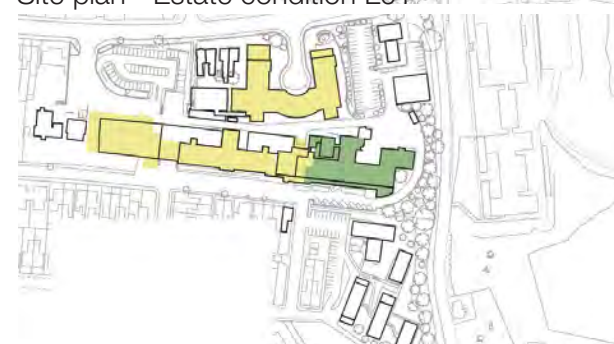
This age profile has implications on backlog maintenance and on the ability to deliver safe and sustainable healthcare. A wide range of areas do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience.

The total backlog maintenance value across the four acute sites was £62.9m in March 2020 of which circa £40 million is categorised as Significant Risk. At Bronglais Hospital the total backlog cost as of March 2020 is £4.1m with £4m categorised as significant risk. It is important to note that in developing areas to meet current guidance capacity may need to be reduced.

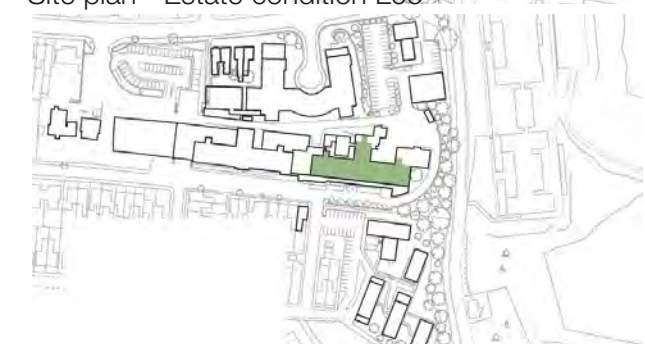
The main buildings at Bronglais were constructed in the 1960s. As part of the recent Front of House upgrade works several areas in the main hospital have benefited from significant investment and are in good condition. These include the accident and emergency unit, the day care surgical unit, the outpatient department, maternity services, pathology services, operating theatres and multi storey car park. The original 1960s buildings have also been partially refurbished internally.

Investment is still required in several areas to remove significant infrastructure risks such as the following key risks identified on the latest backlog maintenance schedule (March 2020);

- AHU and ductwork serving X-Ray and ITU departments
- Fire compartmentation upgrades and fire door replacement
- Replacement roof covering to Block 1
- Replacement of single glazed steel windows to Block 1
- Sanitary facilities throughout require upgrades
- Patient call system requires upgrade
- Passenger and patient lift upgrades



Site plan - Estate condition L03



Site plan - Estate condition L07

2.9 Services Infrastructure: Mechanical

Much of the infrastructure dates from the original build. Some of the distribution has been replaced over the life of the hospital but the majority of these replacements have been local, linked to specific issues and primary routes. Despite maintenance and repair, much of services infrastructure has now reached the end of its service life.

Heating Systems

The majority of the heating for the site comes from the central boiler house which under went complete replacement in 2011. The new plant consists of 2 dual fuel steam boilers and 6 dual fuel LTHW boilers. A CHP unit provides LTHW to supplement site heating.

Steam, LTHW and DHW are distributed to various buildings across the site from the energy centre. For block 01 (Surgical Block) and the new Front of House development, LTHW and DHW comes directly from the boiler house. For block 02 (Medical block) LTHW and DHW is created via heat exchangers located in two plant rooms.

Heating throughout is provided via LTHW radiators linked to variable temperature water, although extensive failure of the control valves has occurred.

A further 2 gas fired boilers are located within the post graduate centre providing LTHW and DHW via a district heating system to the centre and nearby residences. The smaller peripheral residential size buildings are heated using local domestic boilers of varying ages (10 – 30 years)

Ventilation Systems

General ward areas are naturally ventilated via opening windows.

Ventilation is provided via 26 AHUs to a number of departments including pathology, theatres, endoscopy and HSDU. The majority of plant is located externally due to a lack of internal space. Corrosion is apparent on much of the external plant, accelerated by the sites close proximity to the sea. The AHUs provide 100% outdoor air but generally do not have heat recovery, only in those which have been recently replaced. The unit age ranges from 5 – 20 + years.

Cooling

16 chilled water plant provide cooling to circa 19 AHUs. 8 of the 16 units are gas fired. 5 additional AHUs located around the site use local DX cooling units. A number of these units are now at end of life and in need of replacement.

Additionally, circa 32 smaller split units provide local comfort cooling around the site, controlled locally by users

Steam

Steam on site is used for plate heat exchangers and air handling unit heating batteries, as well as other processes such as autoclaves and humidification in air handling units. Steam is generated in the energy centre.

Water

The site is supplied by a number of water supplies. This is predominantly through the main 50 mm domestic water supply but also via an 80mm post graduate centre supply, a 25mm supply for Ty Geraint, 15 mm for the management building and 4 smaller domestic water supplies to peripheral buildings.

Water from the main supply is held within two large and one small storage tank.

Extensive replacement of the domestic water system would be required to bring it up to current WHTM requirements for temperature monitoring and legionella control.

Foul Drainage

Above ground vertical stacks and horizontal runs date from the original installation, local repairs and modifications have been carried out to suit specific issues and blockages.

Medical Gasses

Medical gasses have been well maintained but will require local upgrade to meet current WHTM standards regarding resilience of supply.

Dwr Cymru Welsh Water Asset Plans show that there are combined sewers situated within Penglais Road and Caradoc, which can be seen to the North and South of the hospital respectively. Both sewers join up to the same larger network, following the topography towards Aberystwyth town centre.



2.11 Civil & Structural engineering: Topography & Geology

There is a significant fall in elevation across the site from east to west (circa 25m), which is reflected on the adjacent public highway where an average gradient of 7-8% is noted. The site also slopes from around 15mAOD in the west of the site to around 40mAOD along the eastern boundary.



Site Plan - Topography

2.12 Civil & Structural engineering: Flood Risk

Rivers/Tidal – The Natural Resources Wales plan shows the site to be within flood zone 1 which indicates that the risk of flooding from rivers or tidal waters risk is low.

Surface Water – The majority of the site has a low risk of surface water flooding, however the Natural Resources Wales mapping shows that there are pockets of medium and high risk across the site. The only area of high risk is located at the entrance of the hospital just off Penglais Road.

It is however also worth noting that there is a high risk of surface water flooding along Penglais Road, from which access/egress to the majority of the site including the multi-storey car park and the Emergency Department is achieved.



Site Plan - Flood Risk Assessment Map

2.13 Existing Structure

External condition

Built on a steeply sloping site near the National Library of Wales, BGH comprises a series of stepped linear accommodation blocks that follow the existing topography, and result in a multi storey building with multiple entrances at different floor levels. The original hospital, built in the 1960's, comprised two connected blocks of accommodation: a five storey high medical block on the lower part of the site, and a six storey high surgical block on the upper part. The second floor (Level 2) of the medical block is the only floor that continues through into the surgical block, where it becomes the ground floor.

The site includes a number of peripheral buildings, which include domestic scale properties built in the 1900's, and purpose built residential accommodation blocks and a postgraduate centre that were built in the 1960's. A new MHL D two storey clinical accommodation block was built on the northern part of the site in the 1980's, and is connected to the existing hospital by two storey pedestrian link bridge which connect to the main hospital at Levels 2 and 3. The new clinical block has a concrete frame with facing brickwork cavity external walls, and pitched roof with slate covering.

The existing hospital is a flat roofed, concrete framed structure, with facing brickwork cavity external walls and ribbon windows on the north side, and precast concrete cladding panels, insulated render on masonry cavity walls, and ribbon windows on the south side. External walls on lower storeys have rusticated dressed stone cavity walls. Vertical circulation cores, located on the northern side of the building, have facing brickwork cavity walls with curtain walling. The main operating theatres are located on the top floor of the surgical block in a mansard structure clad externally with profiled metal cladding panels.

In 2012 a new three storey extension was built on the western end of the hospital to accommodate a new accident and emergency unit and day care surgical unit, along with its associated plant. The project also included the construction of a new concrete framed multi storey car park. The new unit has a concrete frame and lightweight external wall panels with insulated render or stone rain screen cladding. Subsequent investment has seen extensive remodelling and refurbishment of clinical areas including the maternity department, outpatients department, and the main

operating theatres. A new fire evacuation lift is currently being installed on the southern side of the building to serve the main operating theatres on the uppermost floor of the surgical block.

Overall the frame and floor structures of the clinical accommodation are operationally sound, with minor repairs required. The external walls are in fair condition, and also require some repairs. The Surgical roof was renewed in 2017, but others require major repair or replacement.

The smaller scale traditionally built properties, residential blocks and postgraduate centre are all in fair condition, and require minor repairs.

Significant concerns are listed below:

- Single glazed steel framed curtain walling to stair cores is reaching the end of its functional life, and requires major repairs or replacement.
- Double glazed aluminium framed windows have leaking seals and gaskets, and require repair or
- replacement.
- Some facing brickwork walls require re-pointing, and moderate cracking needs further investigation and repair.
- Cracking and displacement of precast concrete cladding panels requires further investigation and repair.
- Some flat roof coverings have poor insulation values, are reaching the end of their functional life, and require replacement.
- Expanded polystyrene insulation used behind the external render finish requires monitoring to maintain condition.

Internal condition

Original partition walls are of masonry construction with plastered finishes and painted decoration, otherwise partitions are of lightweight construction with plasterboard linings fixed to a timber or metal framework. There are demountable, part glazed, metal framed partitions to ward bedrooms.

The internal fabric and finishes where not subject to recent refurbishment are generally in fair condition but showing signs of fatigue, with localised areas of impact damage. Many areas in the main hospital have benefited from significant investment however, and are in good condition. These include the accident and emergency unit, the day care unit, the out patients department, maternity services, pathology services, and the operating theatres.

The main areas of concern are as follows:

- There are unsuitable floor finishes in some area, and these require replacement.
- Suspended ceilings in some areas require major repair or replacement.
- Many internal door openings are too small for modern equipment, wheelchair users, and people with mobility aids. They also show significant signs of wear and tear, and are in need of replacement.
- Ironmongery is also often unsuitable and requires replacement.
- Many fixtures and fittings, including storage units and nurse bases, are damaged, in poor condition, fatigued, or unsuitable for modern equipment and computer use, and require replacement.
- Internal primary rainwater and foul drainage pipe work is operationally unsound, with leaking joints and internal corrosion that causes frequent blockages. Both require major repair or replacement.
- Residential accommodation is in poor condition and requires refurbishment.

External works

Public roads border the hospital on three sides, and a primary access road runs bisects the site along the northern side of the main building. The new car park and its access road are in good condition, but the public roads, older access roads and car parks are in fair condition with many repairs and localised crumbling.

2.14 Site: fire assessment

The physical constraints of the existing site, structure and building fabric have a significant influence on the spatial standards and functional relationships at Bronglais Hospital. The linear building form, level changes, and lack of connectivity between buildings make it difficult to achieve efficient flows causing disruption, affecting patient privacy, safety and security.

Many of the circulation spaces within the hospital do not comply with current WHTM 05-02 guidance. Staircases are not sized to support mattress evacuation and there are a number of staircases without lobbies. Progressive horizontal evacuation is not possible from inpatient wards due to the configuration with no connection between blocks at the upper levels

There is evidence of waste etc. being stored in corridors and room functions that would typically be classified as ‘hazard’ rooms in WHTM 05-02 are not all fire protected, these rooms should be provided with a 30-minute fire rated enclosure.

The current backlog maintenance plan identifies a number of significant risk items which need to be addressed including remedial works to compartment and sub-compartment construction, replacement of fire dampers and fire rated doorsets.

Many of the fire protection systems are at the end of their serviceable life and the backlog maintenance plan also identifies remedial works required to the emergency lighting system and that the existing fire detection system falls short of current legislation standards and will therefore require a phased upgrade.

The extent and efficacy of fire protection to the structure is unknown will require further detailed investigation during the Outline Business Case Stage.

2.15 Opportunities and Observations

The Current (2020) Health Board Annual Report identifies a number of key projects at the Bronglais site to address specific clinical needs including;

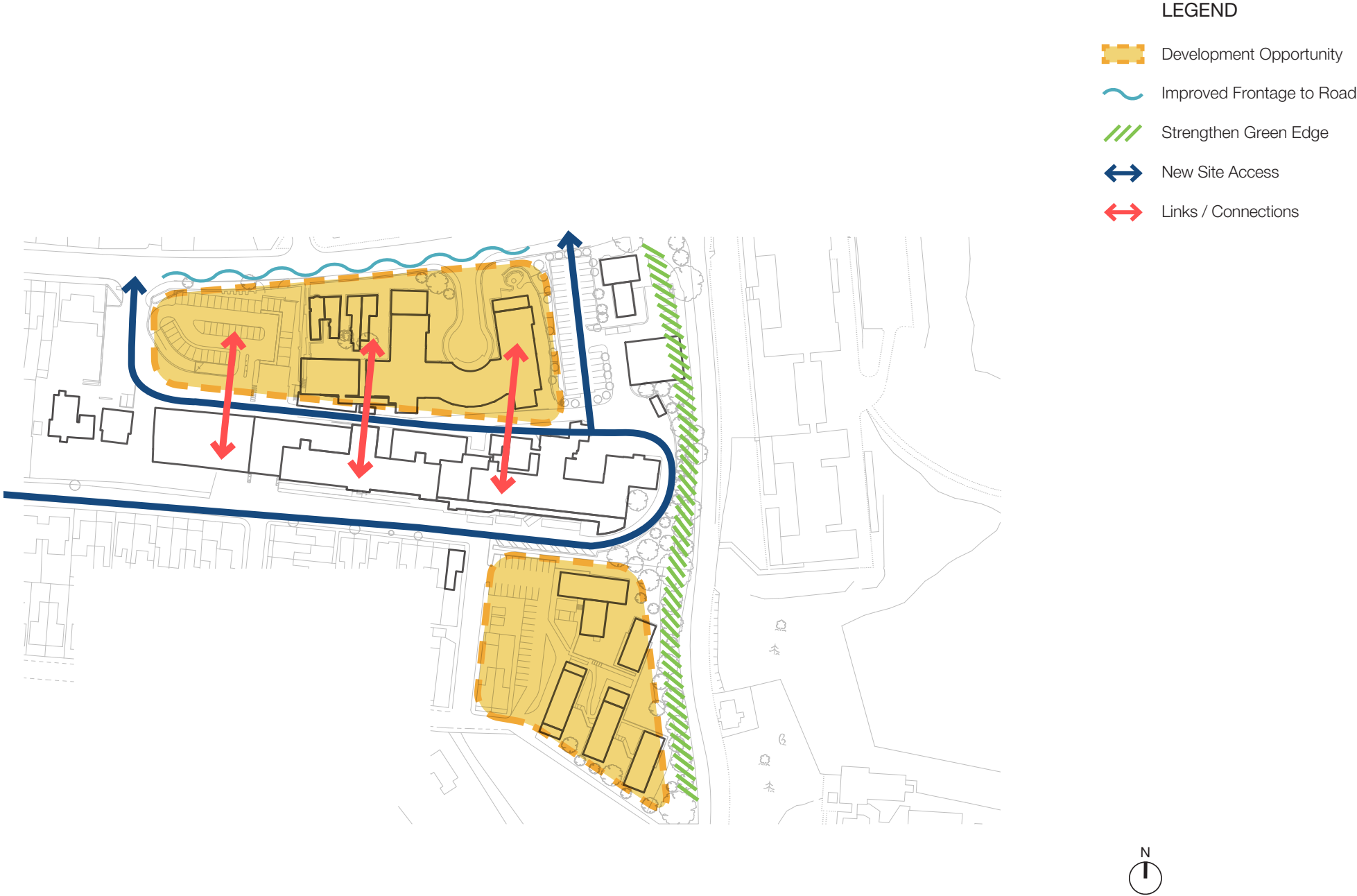
- Chemotherapy Day Unit
- Enlli Ward alterations & refurbishment work
- Aseptic Unit Refurbishment
- Radiology Department improvement works

With regards to the building fabric there is a critical opportunity to assess the energy performance of the existing buildings and consider opportunities to incorporate low carbon technologies to support a move towards net zero carbon. This may include new engineering services plant and infrastructure as well as upgrades to the building fabric.

Part of the existing estate has undergone a significant redevelopment programme over the last 10 years with a new front of house building and refurbishment of block 2. Block 1 would benefit from a similar refurbishment programme at some point in the near future.

As part of a wider site redevelopment strategy there may be an opportunity to demolish or re-develop some of the peripheral buildings around the site. These developments could help expand the current clinical services in modern fit-for-purpose accommodation whilst enhancing the character of the site, creating landscape areas to enhance the wellbeing of patients and staff and improve staff retention.

A separate Programme Business Case has been developed to look at the completion of critical backlog maintenance on all of the Health Board sites with a view to maintaining business continuity during the development and delivery of this Programme Business Case. This detail will help to inform the development of the Building Engineering Services strategy moving forward. It may be that some maintenance activities are deferred in favour of new developments.



Site Plan - Opportunities

3.1 Summary of High Level Brief

The Health Board ten-year health and care strategic vision (“A Healthier Mid & West Wales: Our Future Generations Living Well”) sets out the strategy for whole system change following the outcome of its previous public consultation exercise in November 2018.

The strategy describes the commitment to work in an integrated way across health and social care at a local and regional level, placing significant emphasis on the people and communities which access services provided by the Health Board.

During the initial consultation phase the Health Board identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported;

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision and health outcomes across the three counties, for example there is a 10-year gap in healthy life expectancy across the area.

The consultation phase culminated with the Health Board describing a future model of care based around a network of integrated health & wellbeing centres and community hospitals which will bring key services and staff together in one place and provide virtual links between the local population and specialist services at the acute hospital sites.

The estate strategy which supports this model of care, known as ‘Proposal B’ considers the future transformation of the acute hospital estate and the associated implications on the community infrastructure. It includes provision of a new urgent and planned care

hospital in the south of the region which will centralise all specialist children and adult services. The hospital sites at Withybush and Glangwili will be repurposed as community facilities with beds. Prince Philip and Bronglais hospitals in Llanelli and Aberystwyth will remain as general hospitals with refurbishment works as necessary to support the overall changes to the service model.

The proposed changes create significant opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce.

The findings from the phase 1 consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.

Through the development of the briefing information the Health Board have identified a range of service transformation scenarios which are primarily driven by assumptions on future bed numbers. These are described as follows;

‘Do nothing scenario’ where the current service is retained with no major reconfiguration or transformation.

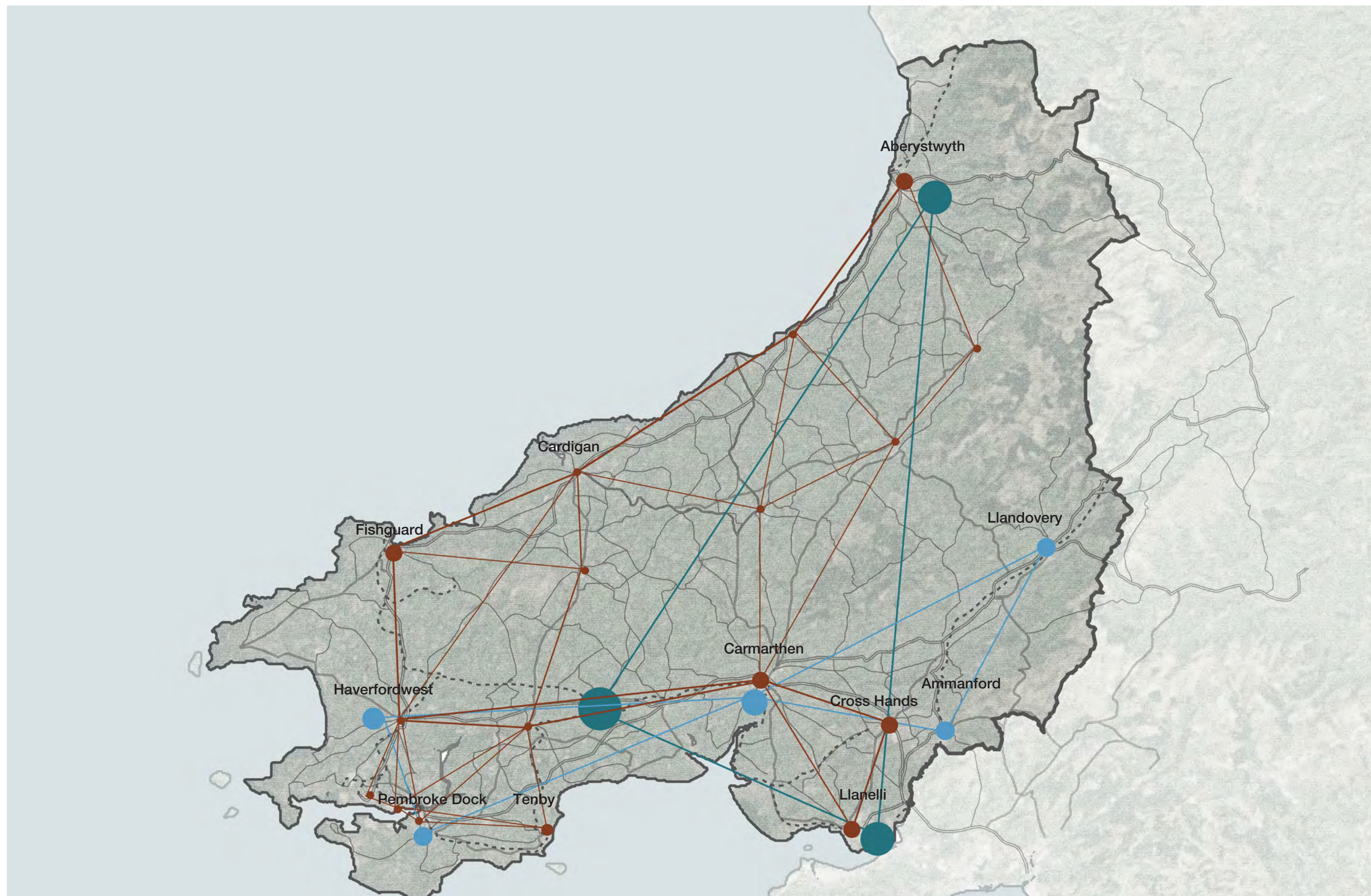
‘Do minimum scenario’ where the current service is retained with minor transformation of services to align with the AHMWW strategy and with focussed investment in new community projects and to bring the acute hospital estate up to Condition B.

‘Minimum efficiency scenario’ where Services are transformed to align with the AHMWW strategy based on pessimistic design assumptions. This scenario assumes a higher number of retained beds with increased retention of beds on the community sites and minimum numbers transferred to the new Urgent & Planned Care Hospital. This scenario also assumes the retention of day surgery at both Glangwili and Withybush.

‘Likely efficiency scenario’ where services are transformed to align with the AHMWW strategy based on a “most likely” set of design assumptions to determine a reduction in bed requirements generally with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites.

‘Maximum efficiency scenario’ where Services are transformed to align with the AHMWW strategy with more ambitious design assumptions applied. The scenario minimises the requirement for beds at the Urgent & Planned Care Hospital and on the associated community sites.

The impact of the various efficiency scenarios on the Bronglais site is considered in more detail on the following pages.



Proposal B: Network of proposed acute and community sites

4.1 Summary of Estate Development Options

The Bronglais Hospital site will build its reputation as an excellent rural provider of acute and planned care. It will continue to provide the current range of urgent, emergency and planned care services with more specialist cases transferred to the main Urgent and Planned Care Hospital (as well as other regional sites for critical care).

A summary of the key functional content as described in the high level service brief is as follows;

- 24/7 Emergency Department and Urgent Care Centre;
- 24/7 access to acute specialties (medicine, surgery, obstetrics & gynaecology, paediatrics);
- 24/7 diagnostic support;
- Critical Care (level 1, 2 and 3)
- Planned major day case and inpatient operations and treatment;
- Day case elective facilities including endoscopy;
- Midwife led unit and low-risk obstetrics;
- Outpatient services including Chemotherapy
- Older Adult inpatient mental health beds.

The service narratives and schedules of accommodation which have been developed to support the programme business case describe the proposed operational and spatial requirements in further detail. Some key elements of the brief are as follows;

- Providing facilities which support the Health Boards vision to be safe, accessible, sustainable and kind
- Achieving design standards set out in Welsh Health Building Notes and Welsh Health Technical Memoranda.
- Protecting patient privacy and dignity
- Supporting efficient flows
- Providing appropriate and logically placed support facilities for staff and patients (zonal hubs)
- Ensuring facilities are both accessible and inclusive
- Maximising the potential for flexibility and future adaptation.

Although the above summary describes the key functional content proposed for the Bronglais site in the future, the Minimum, Likely and Maximum service transformation scenarios describe slight differences in the level of service provision.

In the case of Bronglais hospital, key services such as Emergency, Inpatient & Day case Theatres, ambulatory care services assume the

same in all three scenarios, the key driver of the three scenarios is numbers of inpatient beds, or numbers of generic inpatient beds to be specific.

In the minimum service transformation scenario, alone with 24 admissions beds, 5 critical care beds and 11 mental health beds, retention of 120 inpatient beds (5 24 beds ward units) on the site has been proposed.

The likely service transformation scenario assumes almost the same level of service provision as for the minimum scenario, with slightly different provision of staff & visitor welfare and FM. Despite a reduced number of inpatient beds of 112, the overall area assumption for Inpatient beds in the scenario still remains the same as in the minimum scenario.

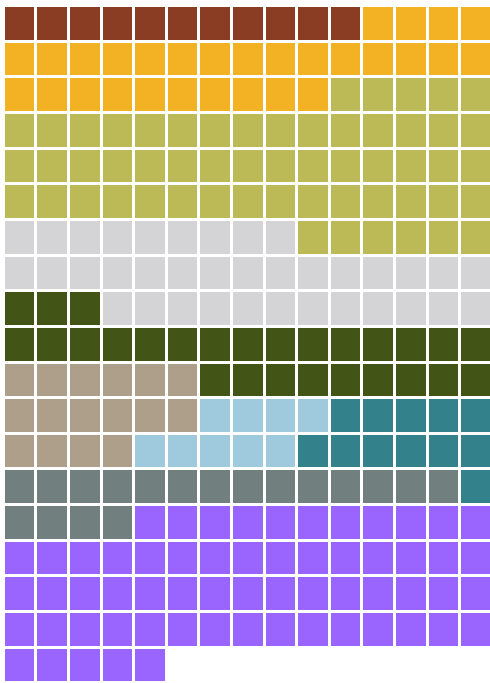
The maximum service transformation scenario assumes a retention of only 98 generic inpatients beds which would only require 4 numbers of 24 beds ward units, one ward less than in the minimum and the likely scenarios.

For each of the service transformation scenarios at the Bronglais site the Programme Business Case only considers options for refurbishment of the existing estate, and within the existing external envelopes. However with the proposed estate footprint in all scenarios being greater than the existing estate area, it's become apparent that some additional spaces will have to be considered not only to better fulfil the clinical service requirement but to provide decant space during the refurbishment.

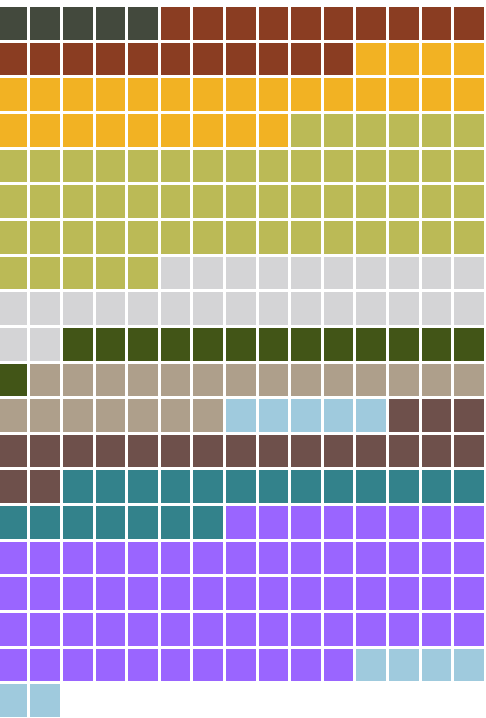
The estate options have different implications in terms of compliances, however the level of new build and refurbishment in all scenarios are almost the same hence the projected cost would also likely be the same.

The range of estate solutions are described in greater detail on the following pages.

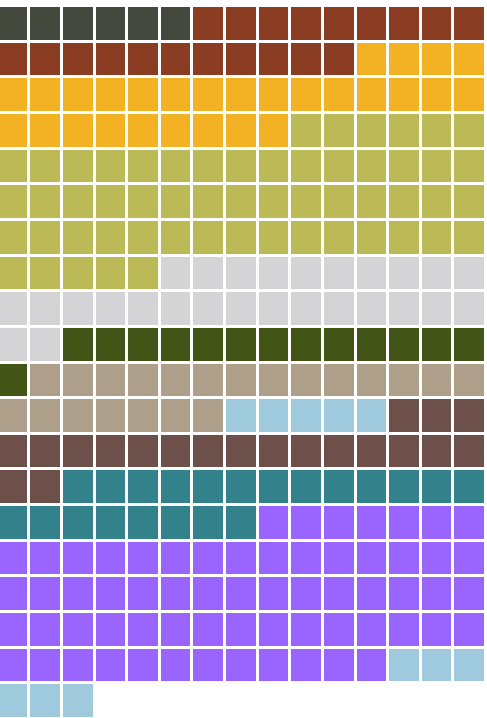
Existing GIA 27,531sqm



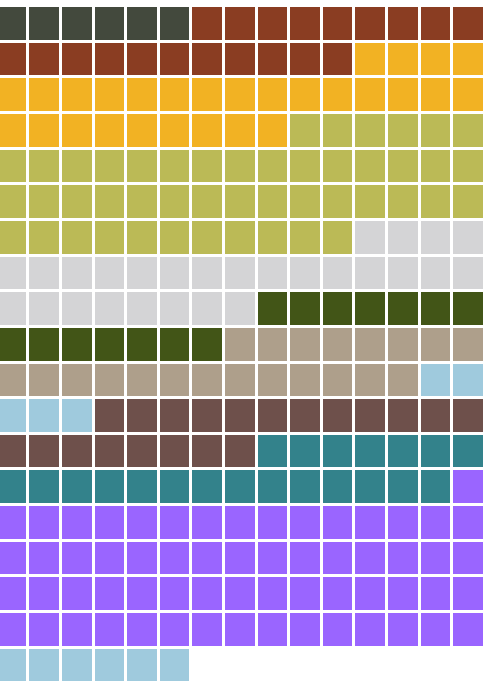
Minimum GIA 28,479.31sqm



Likely GIA 28,672.54sqm



Maximim GIA 27,513.83sqm



- 1 square = 100sqm
- 1.0 Main Entrance Facilities
- 2.0 Emergency Portal
- 3.0 Ambulatory Care
- 4.0 Inpatient Beds
- 5.0 Interventional Suites
- 6.0 Mental Health
- 7.0 Clinical Support
- 8.0 Administration and Education & Training
- 9.0 Staff & Visitor Welfare
- 10.0 Facilities Management
- 11.0 External and Ancillary Areas
- 12.0 Residences
- 13.0 Communication & Plant

1. Area taken from SHP Schedule of Areas V2.2
2. Existing areas taken from analysis of HB data
3. Comparison of existing floor area to proposed functional zones is approximate

4.2 Summary of Proposed Options

In all scenarios, the key functional requirement in the transformation at Bronglais hospital site includes an Emergency Portal of Emergency Department and a 24 bedded admission unit, ambulatory services including both women & children, rehab and non-interventional radiology, as well as two inpatient operating theatres and intervention suite, and two delivery suites. Also included are four or five 24-bed inpatient wards, three day case theatres and an endoscopy suite. Whilst the amount of clinical support in all scenarios is assumed the same, the non-clinical support such as FM and staff / visitor welfare is assumed slightly different, some less than others, i.e. minimum scenario's scheduled less FM & staff / visitor welfare spaces than in the other two scenarios.

The proposed solution for all scenarios is based on the retention of circa 23,730sqm of the existing estate including the Day Surgery / A&E Block 15, medical block 1, surgical block 2 and mental health block 3; different levels of refurbishment are proposed to all areas within the blocks based on existing building and space conditions, as well as proposed level of compliances in terms of HBN space standards and relationships especially in the ward units.

The crucial element in proposing any new extension to the existing buildings is the structural capability. Whilst both block 1 & 2 were built in the 1960s, emergency / day surgery block (15) was only built in the recent years and was structurally designed with a potential to build extra floors on top; A new extension of two levels to block 15 has been proposed in all three scenarios.

The solutions assume that 2 nr. of Day surgery Theatres (instead of the 3 proposed by SHP) would be sufficient enough to satisfy both the current and future demands. Therefore the temperate day surgery porta cabin is proposed to be demolished. Staff residences on Bronglais site are no longer envisaged leading to the proposed demolition of the existing residence blocks on the west of the main hospital. The location of this demolished site will provide a great opportunity for building a new integrated education centre in the future.

Together with block 3, block 15, block 1 & 2 will remain as main blocks to provide the core clinical services after the refurbishment works.

Building condition in Block 3 is reasonably good so only a minimum amount of refurbishment is currently proposed. Clinical functions in block 3 will stay the same as existing providing 10 mental health

beds on ground floor and 54 inpatient bed on upper floors, this would mean one less mental health bed than SHP's scheduled, however there are opportunities to provide the extra bed within the area.

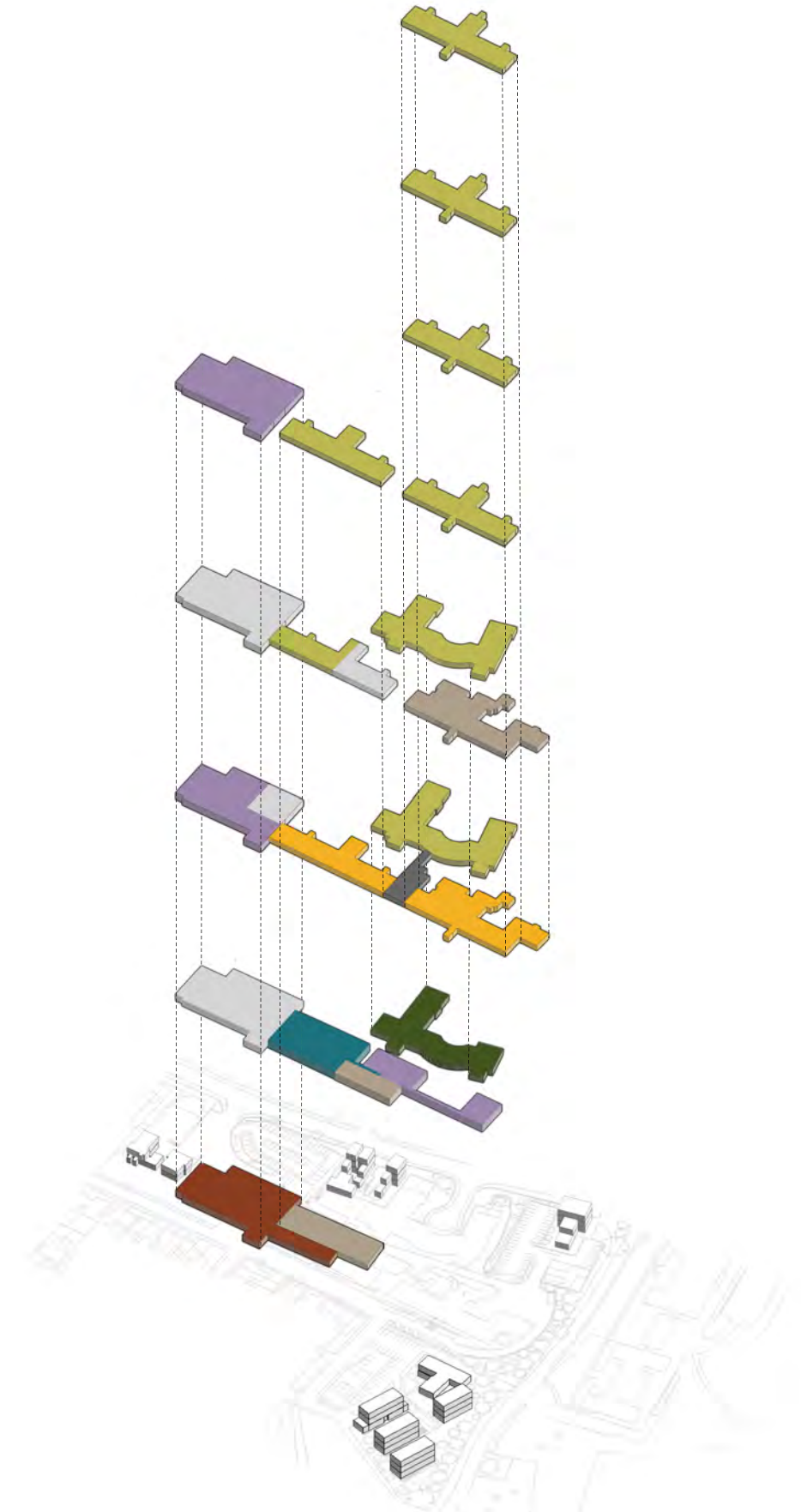
Whilst the majority of clinical functions in the other three blocks will also largely stay the same, for example, Day surgery block & Emergency will operate as they do now, surgical block level 3, 4 & 5 will stay as pathology, Maternity and ward, the inpatient theatres on level 7 and Endoscopy & critical care on level 6 of the surgical block are however proposed to be relocated to a new location. Theatres will move to the new extension on level 3 above Day surgery whilst Critical Care & Endoscopy moving to medical block 1 with a new link to connect block 15 and block 1. The vacated spaces on level 6 & 7 of the surgical block will be re-purposed as new inpatient wards. The proposed work will not only achieve better departmental adjacencies and a better connections between the 'hot' clinical departments, it also provides potential opportunities to upgrade inpatient ward standard, and the much needed decant space to keep the hospital operational during the refurbishment works.

Due to the configuration of the existing footprint in both medical & surgical block, there is very limited potential to introduce fully compliant 4 bedded room with associated en-suite facility, hence it is not possible to provide a 24 bedded care unit within the blocks as desired in the functional brief. The maximum number of complaint single bed is 12 in medical block and 10 in surgical block where access is required to the evacuation lift.

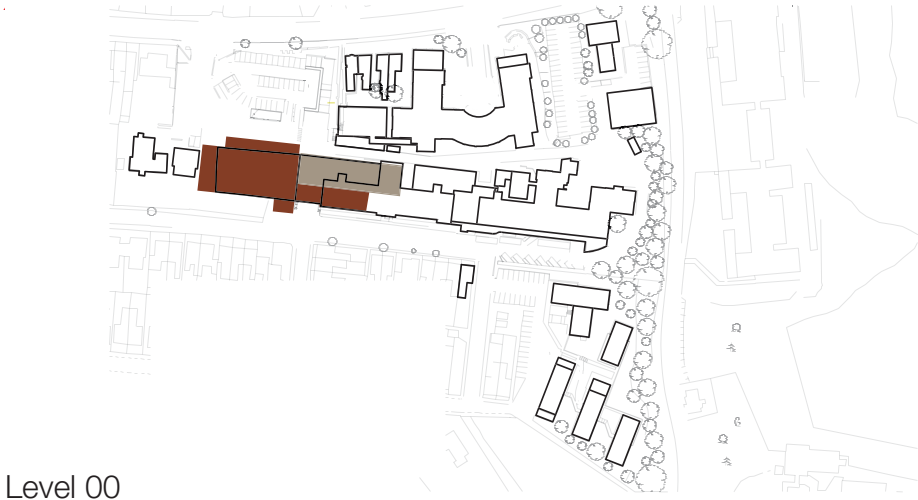
New engineering infrastructure is required for the solution. Along with keeping most of the existing plant provision, additional new plant rooms such as those for the inpatient Theatres are also proposed. New level 4 extension of the block 15 and the roof void will be spaces for the theatre plant and some new air handling units. It is assumed that space within roof void of the existing blocks would be sufficient to house some other air handling units in addition to those in the new roof void to meet HTM requirement.

A full replacement of external facade to both block 1 & 2 is proposed in all scenarios.

Further details of the options and scale of works involved are highlighted on the following page.



4.2 Proposed Clinical Options in All Scenarios



- Main entrance facilities
- Emergency portal
- Ambulatory care
- Inpatient beds
- Interventional suites
- Mental health
- Clinical support
- Admin, education & training
- Staff & visitor welfare
- Facilities management
- External & ancillary areas
- Residences
- Communication & plant

4.3 Minimum Scenario

The total briefed area in the minimum scenario is 28,479sqm which includes allowances of 12% and 17.5% for communication space and plant space respectively.

The main difference in the minimum transformation option compared with the other two scenarios is the number of HBN complaint patient bedroom & ensuite.

In this option it would provide a total of 159 beds including:-

- 126 generic inpatient beds
- 18 admission beds
- 5 CCU beds
- 10 mental health beds

There will be 20 number of generic inpatient beds which are fully compliant with HBN recommendations in term of space standards, these will be on both level 6 & 7 where critical care and Endoscopy and inpatient theatres are relocated providing opportunities to re-purpose and replan the space to each have 10 HBN compliant single bedroom with ensuite with sufficient clinical support spaces.

Details on location and numbers of the generic inpatient beds in the minimum efficiency option are:-

- Block 3 level 1: 10 mental health beds
- Block 3 level 2: 20 beds
- Block 3 level 3: 34 beds
- Block 1 level 4: 24 beds (reduced from 26)
- Block 2 level 4: Maternity as it is 6 beds
- Block 2 level 5: 22 beds as it is
- Block 2 level 6: 10 HBN compliant single beds & ensuites
- Block 2 level 7: 10 HBN compliant single beds& ensuites

Percentage of HBN compliant generic inpatient beds in this scenario would only be 16%.

4.4 Likely Scenario

The total briefed area in the likely scenario is 28,673sqm which also includes allowances of 12% and 17.5% for communication space and plant space respectively.

Compared with the minimum scenario, in addition to circa 100m2 or so more area proposed for the FM and staff/ visitor welfare, there are also 8 number of inpatient beds less, namely generic inpatient beds. In this scenario, a total of 112 generic inpatient beds proposed instead of 120 in the minimum scenario.

In this option it would provide a total of 147 beds including:-

- 114 generic inpatient beds
- 18 admission beds
- 5 CCU beds
- 10 mental health beds

There will be 30 number of generic inpatient beds which are fully compliant with HBN recommendations in term of space standards, In addition to level 6 & 7 being converted into 2 nr. of 10 HBN compliant beds unit, medical block 1 level 3 will also be fully refurbished to provide another 10 single bedrooms & ensuites which will are HBN compliant with sufficient clinical support spaces.

Details on location and numbers of the generic inpatient beds in the likely efficiency option are:-

- Block 3 level 1: 10 mental health beds
- Block 3 level 2: 20 beds
- Block 3 level 3: 34 beds
- Block 1 level 4: 24 beds (reduced from 26)
- Block 2 level 4: Maternity as it is 6 beds
- Block 2 level 5: 10 HBN compliant single beds with ensuites (reduced from 22)
- Block 2 level 6: 10 HBN compliant single beds & ensuites
- Block 2 level 7: 10 HBN compliant single beds& ensuites

Percentage of HBN compliant generic inpatient beds in this scenario would increase to 26%.

4.5 Maximum Scenario

The total briefed area in the likely scenario is 27,514sqm which includes allowances of 12% and 17.5% for communication space and plant space respectively. There are around 1000m2 less area scheduled in this scenario than the minimum and the likely scenario.

The FM and staff/ visitor welfare spaces are envisaged the same as in the likely scenario. However this scenario only requires 98 generic inpatient beds, the least inpatient beds compared with the other scenarios.

In this option a total of 135 beds will be provided:-

- 102 generic inpatient beds
- 18 admission beds
- 5 CCU beds
- 10 mental health beds

Same as in the likely scenario that level 5, 6 & 7 each to have 10 HBN complaint single bedrooms & ensuites, this option also proposes to convert level 4 medical block 1 to have a further 12 HBN complaint bedrooms and ensuites which makes a total of 42 compliant bedrooms & ensuites.

Details on location and numbers of the generic inpatient beds in the maximum efficiency option are:-

- Block 3 level 1: 10 mental health beds
- Block 3 level 2: 20 beds
- Block 3 level 3: 34 beds
- Block 1 level 4: 12 HBN compliant beds with ensuites (reduced from 26)
- Block 2 level 4: Maternity as it is 6 beds
- Block 2 level 5: 10 HBN compliant single beds with ensuites (reduced from 22)
- Block 2 level 6: 10 HBN compliant single beds & ensuites
- Block 2 level 7: 10 HBN compliant single beds& ensuites

Percentage of HBN compliant generic inpatient beds in this scenario would increase to 41%.

4.6 Summary of Refurbishment Works



5.1 Engineering infrastructure

As noted in the summary section of the options. There will be a requirement for both retaining some of the services infrastructure and also provide new services within the buildings. It should be noted that where existing buildings are being retained, there is likely to be challenges regarding mechanical ventilation of these spaces in accordance with the latest guidance. The existing buildings are mostly naturally ventilated and the original floor to floor heights and service voids do not take into account the ductwork requirements. Ductwork will need to be routed to have minimal impact on floor to ceiling heights by distributing vertically where possible. Additionally, there is no allowance for the associated air handling units. New plant areas would need to be located in the roof voids in addition to those provided as part of any new builds. This will require careful consideration during any refurbishment works.

The existing infrastructure for the site varies in condition. However, all will be reaching the end of its service life within the next 10 years and therefore would need to be considered for replacement as part of the maintenance planning.

Any refurbishment will need to consider current WHTMs and WHBNs are incorporated. Fire compliance and appropriate sprinkler coverage can also be ensured as part of these works.

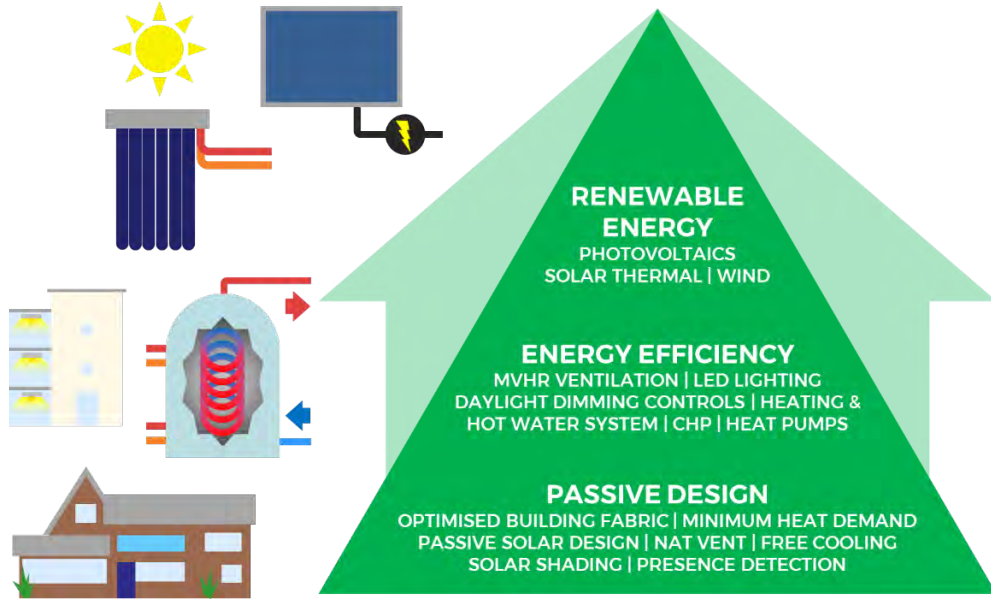
The move to electricity as the primary fuel source for heating for any new buildings in line with current decarbonisation planning will increase the load on the incoming electrical supply. Further work will need to be undertaken to determine if the reduction in estate buildings and improvements in the electrical efficiency offsets the additional load or if more primary electrical infrastructure is required. The existing electrical supply arrangement will be reviewed against WHTM benchmarks to check that it provides the appropriate level of resilience.

Generator back up of the electrical power will need to be provided to provide the appropriate level of resilience to the electrical system. New and refurbished buildings would look to minimise heat loss by maximising the thermal performance of the buildings. This will assist in reducing the energy requirements.

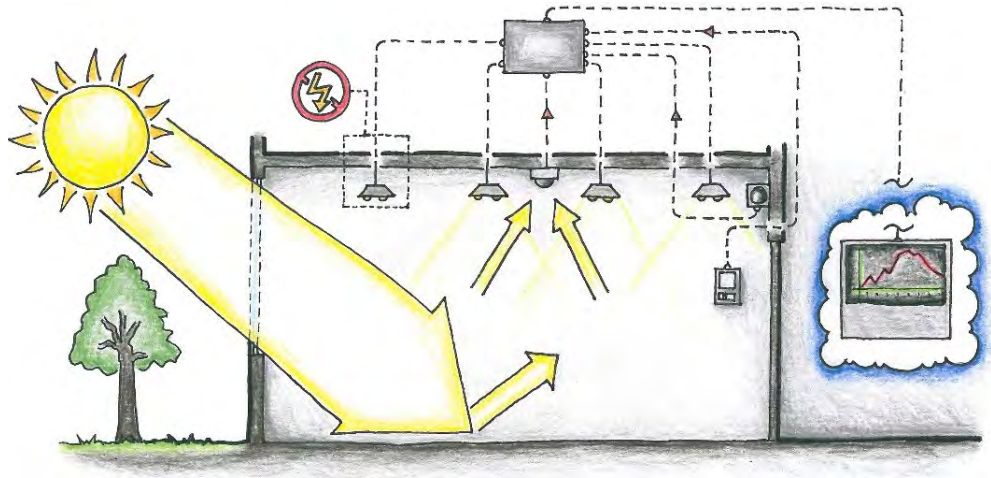
New buildings would also incorporate photovoltaic panels (PVs) to offset energy use.

Incoming telecommunications will be reviewed for their suitability for continued use.

In the “do nothing” scenario, it should be noted that work will still need to be undertaken on the services to maintain the operation of the building. Significant amount of plant and services are at the end of their design life and due for renewal. Fire compliance work would also need to be undertaken to ensure that the building is meeting all statutory requirements.



Energy Hierarchy



Automatic Daylight Control

External works

The new car park and its access road are in good condition, but the older access roads and car parks are in need of minor repairs, which should be considered as part of the preferred re-development option.

Civil & Structural engineering: Topography & Geology

There is a significant fall in elevation across the site from east to west (circa 25m), however development options include only a small/modest extension to the existing building footprint and no significant external works. In this case, there will not be any significant earthworks.

Civil & Structural engineering: Flood Risk

The Natural Resources Wales plan shows the site to be within Flood Zone 1 which indicates a low risk of flooding from rivers or tidal waters. Surface water flood risk will be managed through the drainage and levels design for each of the redevelopment options.

Civil & Structural engineering: Below ground drainage

Surface Water Drainage

All options include mostly refurbishment/repurposing of the existing building infrastructure. Approximately 1141sq m of additional floor area is proposed in the likely scenario and this is likely to require an appropriate SuDS (sustainable surface water drainage) system. The management of surface water runoff, both in terms of quantum and quality, would also need to be considered in a holist manner such that flood risk is not exacerbated.

The new build elements will likely include the requirement for SuDS design principles in accordance with Welsh Government's Statutory Standards to be adhered to. This will generate the need for surface water treatment & attenuation prior to its discharge to either ground

or as per the status quo via the land drainage system. There may also be the need for some reconstruction/realignment/adaptation of existing drainage systems.

Foul Drainage

All options result in a slight increase in foul flows discharging to the foul water drainage system and therefore consideration will need to be made for the potential requirement to upgrade/adapt the existing drainage systems to accommodate the increased flows.

6.1 Implementation Strategy

The preferred way forward is to provide a repurpose and refurbish the existing District General Hospital at Bronglais. This would be complemented with elements of demolition and localised elements of new build / extension. Works will commence at the same time as the proposed Urgent and Planned Care Hospital although completion is approximately 18 months after planned Urgent and Planned Care Hospital opens.

The redevelopment is estimated as being just under five years and the hospital remaining live throughout the duration of the work.

Detailed sequencing of works has not been considered at this stage although the high-level assumption is that an additional storey would be constructed above the existing A&E / Day Surgery unit to accommodate two main theatres, ITU and support accommodation. Small areas of existing single or two storey accommodation between the A&E / DSU and medical block would demolished to facilitate the construction of a new link between these two blocks.

Once theatres have been relocated the exiting theatre accommodation will be refurbished to form additional ward accommodation. Following on from this a phased and sequential ward refurbishment programme throughout the rest of the hospital would commence inclusive of main façade replacements and infrastructure upgrades.

There is also opportunity to redevelop the existing post grad and residences area of the site. Demolition of these buildings would allow the development of non-clinical accommodation which could accommodate management, education and training facilities together with support services which are currently located sparsely across the site.

Whilst there is a requirement for residential accommodation to support Bronglais long term this would be provided via an off-site solution.

Milestone	BGH (refurb)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW framework)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Start on site	June 2026
Construction Completion	January 2031
Commissioning	Feb to April 2031
Overall Opening and site completion	May 2031

*Table based upon preferred Implementation Option No. 1

7.1 Planning

The hospital is located within the administrative area of Ceredigion County Council. The statutory development plan for the hospital site comprises the Ceredigion Local Development Plan (LDP) 2007 - 2022 (Adopted 2013).

Work on the review of the Ceredigion LDP started in 2017. The Replacement Local Development Plan (LDP 2 2018 - 2033) is currently at the Preferred Strategy stage. The Preferred Strategy was consulted on from: 28 June - Midday 12 September 2019. According to the Council’s website, Ceredigion County Councillors agreed a temporary but as yet unspecified length pause for the replacement LDP on 21 October 2021.

Local Planning Policy

The adopted Local Plan policies which are particularly relevant to the site are summarised below.

Policy DM06: High Quality Design and Placemaking
The policy states that “Development should have full regard, and positively contribute to the context of its location and surroundings. Development should reflect a clear understanding of design principles, the local physical, social, economic and environmental context.”

The design of the redevelopment would need to consider policy DM06 and the sub-provisions within the policy.

Policy DM07: Conservation Areas
The policy states that “Development within Conservation Areas, as designated on the Proposal Map, and any future designated Conservation Areas must demonstrate that regard has been had to Conservation Area Appraisals, where available, and national guidance.”

The site is located on the edge of the Aberystwyth Conservation Area. Consideration would need to be given to avoiding any harm to the setting of the Conservation Area.

Policy DM13: Sustainable Drainage Systems
The policy states that “Non-residential development of 500m2 or more is accompanied by a SUDS that is capable of being adopted by the SUDS Approving Body” and “If SUDS cannot be implemented a full written justification should be submitted explaining why this is the case.”

Sustainable drainage would need to be considered from the outset in any redevelopment.

National Planning Policy

In terms of National Planning Policy, Future Wales: The National Plan 2040, Planning Policy Wales and Technical Advice Notes (TAN) would apply to the site.

Future Wales: The National Plan 2040

Future Wales is the National Development Framework for Wales, setting the direction for development in Wales to 2040. Future Wales is a spatial plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

Planning Policy Wales

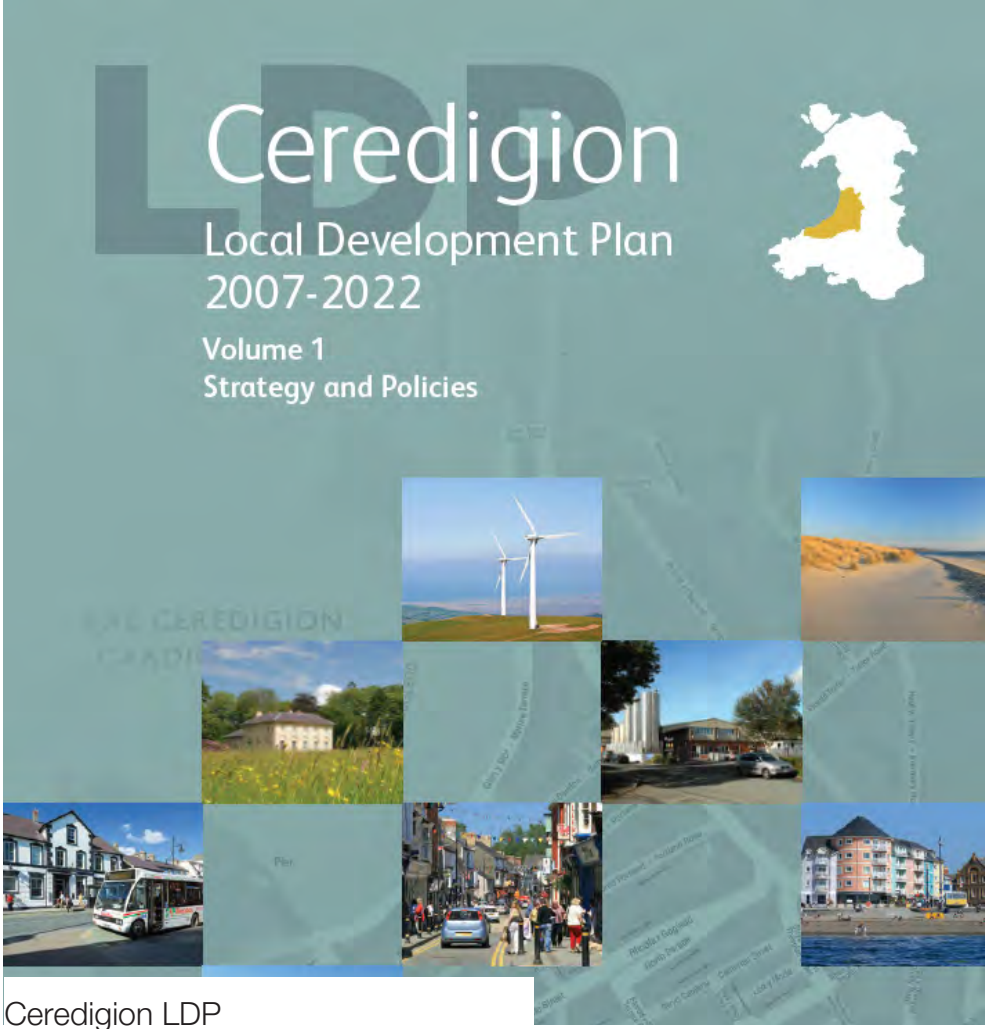
Planning Policy Wales (PPW) Edition 11 (February 2021) outlines the Welsh Governments land use planning policies. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

Technical Advice Notes (TANs)

TANs provide detailed planning advice to accompany Future Wales and PPW. In terms of Bronglais Hospital, the following TAN would be especially relevant:
TAN 12 Design

TAN 12 sets out design guidance for developers to adhere to, ensuring that sustainability through good design is promoted within the planning system. Guidance within this note would need to be considered at the design stage, including the production of a Design and Access Statement to accompany the planning application which is a requirement for any ‘major’ development in Wales, this is any development over 1ha.

Paragraph 5.10.1 states that “In the design of schools, hospitals and other buildings and infrastructure intended for use by the local community the aim should be to achieve fitness for purpose, value for money over the whole life of the building, and a positive impact on the lives of those who use it and on its surroundings.”



8.1 Cost Summary

Works Cost

The redevelopment at Bronglais Hospital comprises a new extension at high level, the refurbishment of the existing accommodation and the construction of a new Integrated Education Centre to replace existing residences. The costs for all works are based on an elemental cost per m2, and the traditional approach using DCAGs has not been followed. The rationale for this is that the DCAGs database has not been updated for a considerable time, and there have been several significant changes in both healthcare design standards and planning and building regulations requirements which render the DCAGs unreliable.

New Education Centre and Extensions

The basis of the elemental cost is the benchmark cost reports for similar schemes and the Grange Hospital elemental analysis, which takes account of a number of additional cost drivers including further regulatory change and design aspiration, as follows:

- BREEAM 2018 in lieu of BREEAM 2014 – addition 0.75%
- Decarbonisation aspirations – addition 3%
- SMART costs – addition 1% (see Non-works costs for impact on IT costs)
- Biophilic Design aspirations – addition 2%
- Location – addition 2%

The percentage additions were derived from various sources and also take account of the rural area in which the developments will be built.

The cost for the extension was adjusted to reflect the complexity of building at high level and for the less complex nature of the Education Centre.

Refurbishment Works

The basis of the elemental costs for the different types of refurbishment works is benchmark costs, developed using an extensive database of costs, as above. The elemental costs are then adjusted to reflect the scope of the proposed refurbishment works. Two scopes of refurbishment are included – major and light touch.

External Works (Oncosts)

The scope of external works has been significantly reduced to reflect the limited scope of site development at Bronglais Hospital.

Demolition costs and phasing costs are included to reflect the scope and extended programme of the works.

A benchmark of 18.5% has been included for fees and survey costs. This includes for all principal designers but also the specialist designers such as acoustic and fire engineers, ecology and BREEAM consultants. Specialist advisors for the Health Board including the District Valuer, Vat advisor and audit services are included.

Non-Works Casts

IT Costs: A meeting has been held with the Health Board's IT lead. The IT budget reflects the SMART hospital aspirations for the future within the context of a refurbishment scheme.

An allowance of 1% of the Works Cost has been included for art. An allowance for other Non-Works costs has been included benchmarked against the Grange Hospital.

Costs are included for the decant works required to facilitate the phasing. No decant accommodation is included.

The equipment allowances for the campus developments utilised varying percentages to reflect the potential equipment requirements for each function/scope of work.

An allowance of 10% has been included as a Contingency. No provision for Optimisation Bias has been included in the capital costs.

Vat has been included at the current prevailing rate of 20%. Vat reclaim has been included for all design fees and the asbestos removal cost.

The capital costs have been costed at 4Q 2021 price levels with a forecast PUBSEC Index of 269. Costs have also been presented at the Business Case Reporting Index of 250. It is recognised that future adjustments to these costs will be made against the Business Case Reporting Index of 250.

8.2 Cost Summary Table

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£7,983,400	£91,617,278	£75,905,262	£75,905,262	£75,905,262
On-costs	incl	incl	£9,024,921	£9,024,921	£9,024,921
Location adjustment	incl	incl	£0	£0	£0
Fees	incl	incl	£15,712,084	£15,712,084	£15,712,084
Non-works cost	incl	incl	£10,412,162	£10,412,162	£10,412,162
Equipment costs	incl	incl	£5,795,468	£5,795,468	£5,795,468
Contingency	incl	incl	£11,684,990	£11,684,990	£11,684,990
VAT reclaim	incl	incl	-£2,720,681	-£2,720,681	-£2,720,681
Project cost	£7,983,400*	£91,617,278	£125,814,206	£125,814,206	£125,814,206

* Cost at March 2021 Price Level

Note:
All figures listed above in black are
gross costs inclusive of VAT

Hywel Dda University Health Board

A Healthier Mid & West Wales: Transforming our Hospitals Programme Business Case

Estates Annex: Appendix B Glangwili Hospital

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Revision History

Rev	Date	Revision Description	Issued By	Checked By
Rev 0	17.01.2022	Issued for Health Board Review	SW	ND

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2.	Existing Estate
3.	Summary of Proposed Functional Content
4.	Estates Options
5.	Engineering Infrastructure
6.	Implementation Strategy
7.	Town Planning Considerations
8.	Cost Summary

Glangwili Hospital

1.0 Description of the Hospital

Glangwili General Hospital is located in the town of Carmarthen. It is situated about 2km to the north east of the town centre, adjacent to Dolgwili Road and close to the new A40 town by-pass link road which connects Carmarthen to Llandovery and Aberystwyth to the north of the Health Board area. The site occupies approximately 11.31 hectares and is relatively flat with only a slight fall from West to East. The site is bounded to the East by a heavily wooded area adjacent to the A40 and Gwili Heritage Railway line and to the West and South by low rise residential areas.

The first hospital in the Town was the Carmarthen Infirmary built in 1858 on Priory Street in the Town Centre. The building became part of the NHS in 1948 and remained in use until the late 20th Century. During the second world war the US military established a hospital and Prisoner of War camp close to Abergwili and following the establishment of the NHS the buildings and infrastructure were repurposed as the 'West Wales General Hospital' in 1949.

The new West Wales General Hospital was built in the early 1960's to designs by Percy Thomas. The current hospital has a gross internal area of 51,294sqm and key clinical functions include 383 inpatient beds, an Emergency and Urgent Care Centre, diagnostic imaging, operating theatres and critical care, outpatients and a Renal Dialysis Unit.

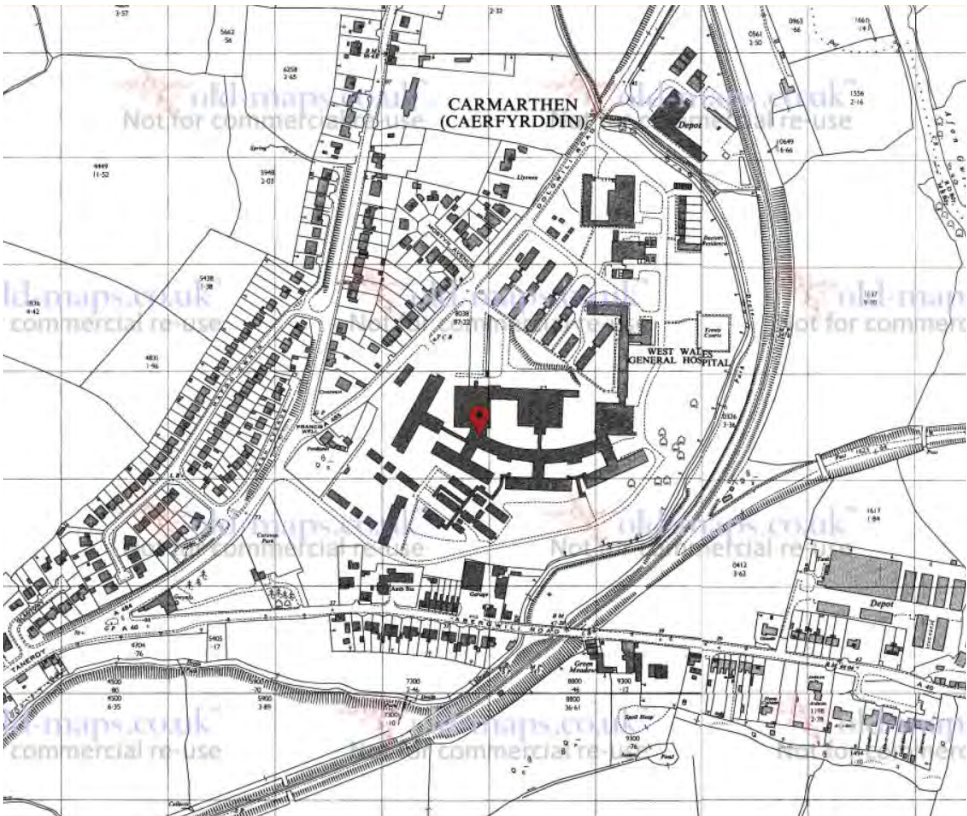
The majority of the buildings on site were part of the original hospital and range from 50-60 years old. Although they have received some remedial work most still require comprehensive repair and refurbishment. The facades of these building are a mix of exposed concrete frame, curtain walling and infill brickwork, much of which is at the end of its service life and requires replacement. The original flat roof was replaced with a pitched roof structure in the early 1990s but with little maintenance in the intervening period this roof is also now suffering with water ingress.

Buildings built within the last 20 years are generally considered to be in good condition.

There are known statutory compliance issues with the hospital including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. It is understood that many of these issues cannot be resolved without major reconfiguration and potential loss of bed numbers. The most significant statutory compliance issue relates to fire safety and an enforcement notice was issued by Mid and West Wales Fire and Rescue Authority in 2019. The Health Board are currently preparing a business case to support the delivery of remedial works to bring the building fabric up to statutory compliance..



Glangwili Hospital Entrance



Glangwili Hospital Site Layout 1968

Glangwili Hospital

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The internal spaces and layout are reflective of the timing of the construction in the early 1960's and much of the internal layouts in the original buildings are no longer suitable for the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity, increases infection risk and makes safe manual handling more difficult to achieve. Many of the patient beds are arranged in 4 bed bays which are significantly below current space standards and the proportion of single rooms (20%), falls below current recommended standards. Very few bedrooms are equipped with en-suite facilities.

Staff facilities are also known to be below standard with reports of insufficient support spaces such as staff rooms, toilets, changing facilities and office accommodation.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update electrical infrastructure, nurse call and bed head services and heating infrastructure. A number of major plant items were also identified as being 'end of life' including Combined Heat & Power plant, LTHW boilers, control panels, pressurisation tanks, calorifiers, Vacuum pumps, Oil storage tanks, chiller plant and a number of AHUs. It is also understood that the water mains infrastructure is nearing end of life and may require replacement.



Aerial view of Glangwili Hospital (Google Maps)



Glangwili Hospital



Military Hospital at Glangwili - 1940's

2.1 Site: Massing

Glangwili General Hospital is situated to the north east of Carmarthen town centre occupying a relatively flat site of approximately 9.46 hectares adjacent to Dolgwilli Road. The site is bounded to the East by a heavily wooded area adjacent to the A40 and Gwili Heritage Railway line and to the West and South by low rise residential areas.

To the west the site is bounded by a line of mature trees and a steep slope down towards the Western Cleddau River. The remainder of the site is characterized by low landscape planting and extensive car-parking.

The site is accessed from two separate locations along Fishguard Road although ultimately all staff, public and blue light traffic flows through a single roundabout outside the main entrance. A secondary access for FM traffic runs adjacent to the retail park to the South and connects to a one-way hospital ring road providing access to the estates and facilities accommodation situated on the western boundary of the site.

There are two main groups of buildings on the site; the original three story hospital building from the 1970's which has been extended a number of times including most recently a renal unit adjacent to the front entrance, and a group of staff residences to the north east of the site which were part of the original construction.

The main hospital building is clad in concrete panels with strip windows which are generally UPVC. It has a pitched concrete tile roof which was added in the 1990's to address water ingress issues with the original flat roof. The staff residences are generally brick with UPVC windows and detailing. Newer extensions to the main building consist of terracotta cladding, brickwork and render with aluminium windows and detailing.

There are a number of single storey temporary buildings to the north west of the main building and an energy centre and boiler flue adjacent to the estates buildings to the west of the ring road.



Site Plan - Figure Ground

2.2 Site: Urban Context and Planning

Glangwili Hospital is located approximately 2km to the north of Carmarthen town centre between the areas of Glangwili and Abergwili.

The site is relatively flat and the areas west and south are characterised by low rise residential zones.

The western site boundary is formed by a ‘green corridor’ containing a public footpath and cycleway connecting the Hospital to Carmarthen Town Centre

The current Local Development Plan expires in 2033. The hospital sits at the north eastern edge of the Abergwili development zone and therefore any opportunity to expand the site would be constrained by the current LDP. There are two specific proposals adjacent to the site, one to develop a new railway station on the site of the current heritage railway to the east (outside of the current LDP development zone), and one to develop a plot of land to the north west of the hospital site for additional housing.

There are currently no listed buildings or tree preservation orders on the site.



Site Plan - Planning

2.3 Site: Clinical Zoning

Clinical services currently provided at Glangwili General Hospital include;

- Accident & Emergency
- Diagnostic Imaging (X-ray, CT, MRI)
- Planned care
- Unscheduled care
- Ambulatory care
- Critical Care
- Surgery
- Endoscopy
- Paediatrics
- Midwifery

The hospital also includes inpatient wards with 383 inpatient beds covering the following specialities;

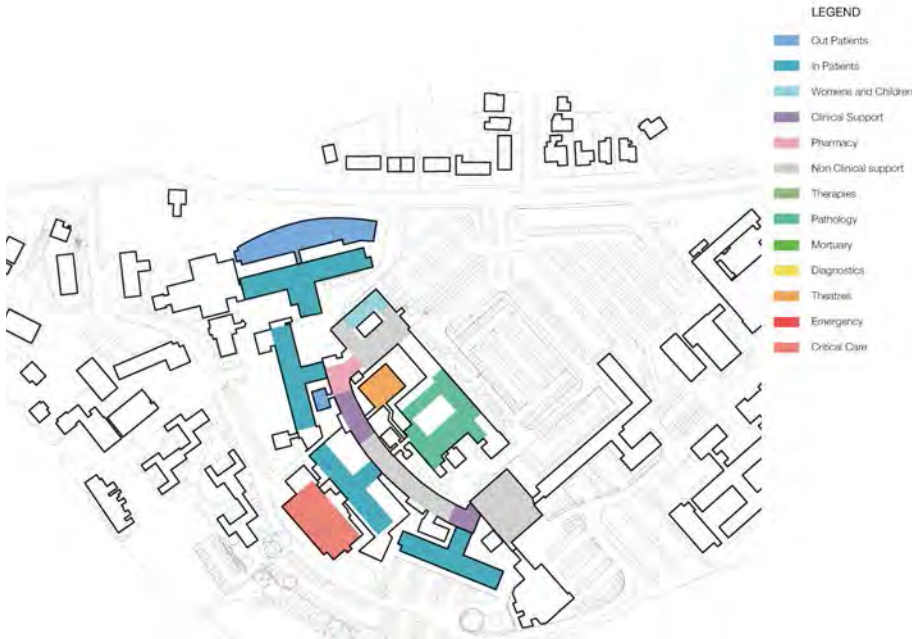
- Obstetrics
- Gynaecology
- General Medicine
- Trauma & Orthopaedics
- Paediatrics
- General Surgery
- Coronary Care
- ITU/HDU
- Urology
- Rehabilitation
- ENT
- Ophthalmology
- Paediatrics (Incl SCBU)

The latest Data Report confirms the overall gross internal floor area as 51,294sqm

Clinical adjacencies are highlighted in the adjacent floor plan diagrams and on the following pages.



Site plan - Ground floor



Site plan - First floor



Site plan - Second floor

2.4 Access & Movement: Site Access & Parking

The site is accessed from Dolgwili Road to the West and the main car-park is adjacent to the site entrance. Further car-parking areas are designated around the site.

All car parking is at grade and the current Data Report suggests that there is a total of 1,323 parking spaces available, of which 32 spaces are designated accessible parking spaces and 971 are dedicated for staff.

A Park and Ride service is available for staff, patients and visitors operating between Glangwili Hospital and the Carmarthen Showground car park.



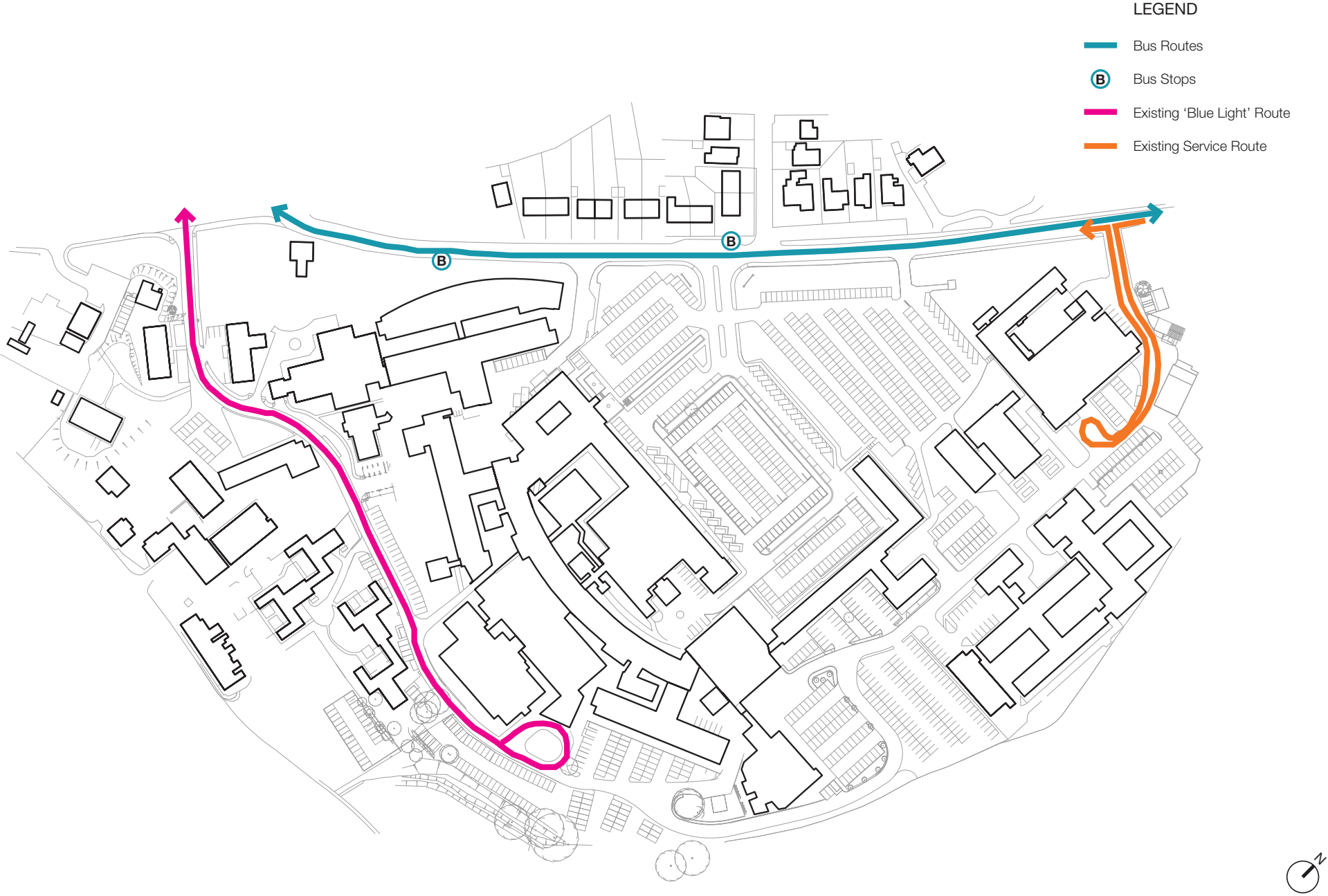
Site Plan - Car Parking

2.5 Access & movement: Emergency & Service Access and Public Transport

The Emergency Department at Glangwili Hospital is located at the south of the main hospital building. The ‘blue light’ access route to the ground floor ED is provided off Bronwydd Road, which is separate from the main entrance route for the public. A turning head and ambulance parking area outside the Emergency Department accommodates emergency vehicles only with dedicated parking adjacent for patients and visitors.

Service access to the site is provided from the same peripheral site road as for blue light traffic. A designated FM deliveries and parking area is provided adjacent to the estates yard.

The nearest public transport interchanges are located in Carmarthen town centre. Bus Services are provided to the hospital from Dolgwili Road and there are two bus stops located just outside the site boundary.



Site Plan - Public Transport and External Circulation

2.6 Access & Movement: Internal

There are various access points around the perimeter of Glangwili Hospital which enable access into each block or specific department. The main entrance concourse however is accessed from the North facing the main public car parking.

Entrance via the concourse will lead you to the hospital street where individual corridors and vertical circulation cores connect the individual departments across the various site levels.



Site Plan - Internal Movement

2.7 Estate Condition

Hywel Dda University Health Board owns and leases buildings which range from 19th Century to modern day with varying degrees of functionality, condition and performance. Almost 40% of the estate is over 50 years old and at Glangwili this rises to over 63%.

This age profile has implications on backlog maintenance and on the ability to deliver safe and sustainable healthcare. A wide range of areas do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience.

The total backlog maintenance value across the four acute sites was £62.9m in March 2021 of which circa £40 million is categorised as Significant Risk. At Glangwili Hospital the total backlog maintenance cost at March 2020 is £30.4m with £19.2m categorised as significant risk. It is important to note that in developing areas to meet current guidance capacity may need to be reduced.

The majority of buildings on the Glangwili site were constructed in the 1950/60s including all inpatient ward blocks, operating theatres, outpatients, radiology and pathology services. There have been a significant number of new developments within the last 20 years which are all in good condition including new facilities for renal dialysis, urgent care, women’s and children and a new mortuary.

There are a number of significant estates constraints on the site such as limited area for future expansion, low density buildings and pressure on car parking spaces. The ratio of non-clinical to clinical accommodation has increased on site in recent years.

The adjacent diagram illustrates the key challenge in that the majority of buildings ranked as condition C are embedded at the core of the site surrounded by more modern extensions which are generally condition category A/B. Investment is required to remove significant infrastructure risks such as the following key risks identified on the latest backlog maintenance schedule (March 2021):-

- Fire compartmentation upgrades and fire door replacement
- Replacement curtain walling and single glazed steel windows
- Replacement of external cast iron drainage pipework
- Upgrades of electrical systems installation
- Replacement of roof coverings and rain water goods
- Replacement of air handling units



Site Plan - Estate Conditions

2.8 Services infrastructure: Electrical

HIGH Voltage System

The site is served by a Western Power distribution owned and operated High voltage ring main at 11kV terminating in a HV Switches.

The HV Switches feed 2 No. 1.5MVA 11/0.4kV oil cooled transformers designated TX1 and TX2.

Low Voltage System

Main LV Switchboard

LV supplies are derived from the transformers terminated in split. LV switchboard with ACB bus coupler. The switchboard is of GE manufacture and built by Twyver Switchgear. It was installed in 2001 and has been maintained and is in good condition.

Generator Switchboard

The generator switchboard is approximately 6 years old and is in very good condition.

LV Distribution

The site runs a number of open LV rings routed primarily through a network of services ducts running under the hospital.

The majority of the submain distribution is in excess of 20 years old. A newer submain was installed as part of the CDU works circa 2012.

Section Boards/Sub distribution.

LV Submains terminate in LV Switchboards around the site. These are generally Schneider switchgear and vary in their ages.

On site Generation

Generator

A single 2.5MVA diesel internal combustion engine provides 100% standby generation for the site.

CHP

A 165kW Combined Heat and Power unit installed circa 1990 provides electricity and supplemental DHW. It is approaching the end of its designed life, is inefficient and does not meet the CHPQA for climate levy relief.



Site Plan - Electrical Infrastructure

Photovoltaic

A small 3.5kW PV array is installed at the CDU and has been in place since circa 2012.

2.9 Services infrastructure: Mechanical

Much of the infrastructure dates from the original build. Some of the distribution has been replaced over the life of the hospital but the majority of these replacements have been local, linked to specific issues and primary routes. Despite maintenance and repair, much of services infrastructure has now reached the end of its service life.

Heating Systems

A central boiler house supplies 77% of the heating and hot water demand over 81% of the estate (m2). This is generated by three heavy fuel oil (HFO) fired steam boilers (1990) operating alongside a 999kw Bio Mass boiler commissioned in 2015. The biomass boiler supplies the base load for the site.

From this plant low temperature hot water (LTHW), domestic hot water (DHW) and steam are produced and distributed across the site via the subterranean ducts. For some buildings LTHW and DHW are created via local plate heat exchangers and distributed via pump sets.

The heating is provided by LTHW radiators. Overall, there is no local control, some buildings with local thermostatic radiator valves or with variable temperature water regulated by 3 way mixing valves where the LTHW enters the building.

23% of heating consumption on site is supplied by 10 local low pressure gas fired boiler plant (19% of the estate). These are independent buildings aged from the 1980s (Teilo, Ty Cadel, KRUF) through to 2011 (Mortuary).

A small number of bungalows on site are heated using gas oil. The use of Heavy Fuel oil (HFO) as a principle fuel source is a key issue for Glangwili. This is an historical position as there is currently no access to high pressure gas mains. There are concerns over the long term availability of the fuel oil and the carbon emissions from such a fuel source.

Many wards have the original heat emitters and distribution pipework, although local modifications and repairs have been undertaken as required.



Site Plan - Mechanical Infrastructure

Ventilation Systems

General Ward areas are naturally ventilated through the use of opening windows.

Ventilation is provided via 39 Air Handling Units (AHU) at a number of departments including operating theatres, Emergency Unit, Renal and Endoscopy. The majority of the units are located in the following areas:-

- Emergency Unit – installed in 2008, 100% outside air with heat recovery;
- Mortuary – installed in 2012 – 100% outside air with heat recovery;
- Core Block (Theatres, DSU, Endoscopy) – older systems with heat recovery;
- Renal & Cardio Respiratory – installed in 2010, 100% outside air, no heat recovery;

AHUs to the main block are original and in poor condition; other plant is at the end of its service life and due for replacement. Where AHUs were replaced, main ductwork was retained. Fire damper monitoring and compartmentation appear to be an issue.

Cooling

There is no centralised cooling on site. 10 large chilled water plant provide cooling to 27 AHUs. The theatre chiller was replaced in 2006, however the remaining system are the originally installed systems. Although maintained and repaired, they are due for replacement. The remaining 12 AHUs located around the site use local DX units. Circa 90 small split units provide local comfort cooling around the site, controlled locally by users. There is no ventilation in patient rooms. Additionally portable cooling equipment is widely utilised during warm weather and in areas which are overheated.

Steam

In addition to heating utilisation, steam is also required for air handler humidification and process loads i.e. laundry, hydrotherapy pool, autoclaves and kitchen. The on-site laundry services the whole Health Board utilising eleven steam fed washing machines (with water recovery), five steam fed driers and two steam fed ironing machines. The steam main in the service tunnels was replaced approx. 15 years ago, however the blocks and risers are still using the original infrastructure.

Water

Domestic water is provided via 2 main supplies (65mm and 50mm). Water from these supplies is held in large storage tanks to ensure a constant water pressure.

The Postgraduate Centre has its own 20mm domestic water supply. Additionally, the site is serviced by an emergency supply (100mm) and emergency supply bypass (20mm). Currently, use of grey water is undertaken in the laundry only. Flow restrictors and cistern dams were installed in taps and WCs in 2008.

Domestic water systems will require replacement to meet current WHTM requirements for water temperature monitoring and legionella control.

Foul Drainage

Vertical drainage and horizontal runs within the blocks are from the original installation and suffering from blockages. Some replacements have been carried out to address specific blockage issues.

Medical Gasses.

Medical gasses have been well maintained but will require local upgrade to meet current WHTM standards regarding resilience of supply. Some main plant is also due for replacement due to the age of the equipment.

2.10 Civil & Structural Engineering: Below ground drainage

The drainage system within the site consists of separate foul and surface water systems.

Surface Water Drainage

The majority of surface water from the site discharges via a network of gravity sewers to a land drainage system/watercourse to the south east of the site. It can however be seen from the private drainage records that some surface water runoff (from the western end of the site) is discharged into the combined sewerage system.

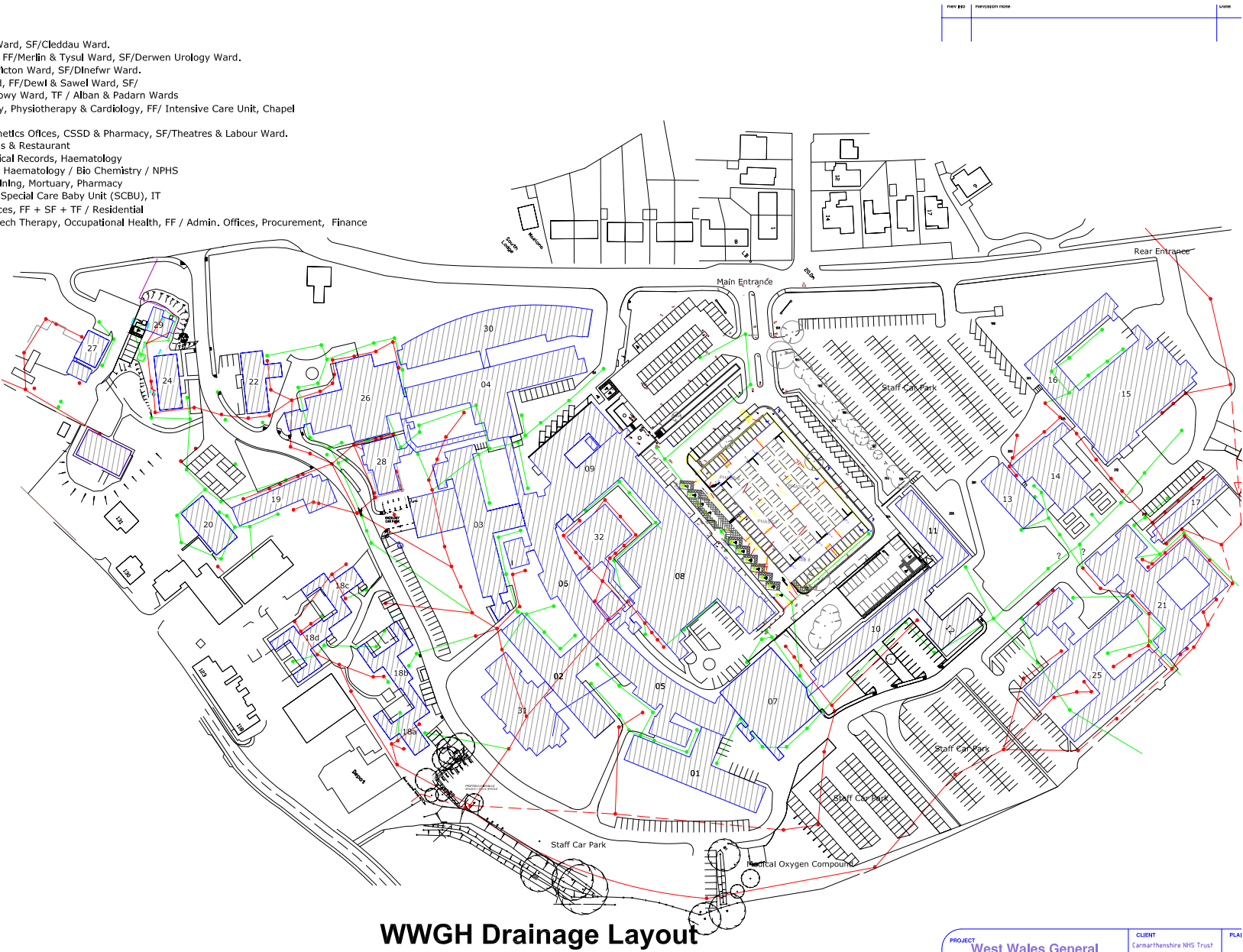
Foul Drainage

Dwr Cymru Welsh Water’s Asset Plans show that there is a combined sewer network which gravitates in a clockwise direction around Glangwili hospital before routing to the south west alongside the A40 road.

The site is served in the main by a network of gravity sewers that convey the foul water generated by the hospital to the aforementioned combined sewer. The pumping station pumps flows to the public sewerage system in Fishguard Road at the front of the site. There are no reported issues with this system.

BLOCK CODING

- 01 Ward Block 01 - GF/Teifi Ward, FF/Ceri Ward, SF/Cleddau Ward.
- 02 Ward Block 02 - GF/Preseli & HDU Ward, FF/Merlin & Tysul Ward, SF/Derwen Urology Ward.
- 03 Ward Block 03 - GF/Cllgerran Ward, FF/Pkton Ward, SF/Dinefwr Ward.
- 04 Ward Block 04 - GF/Dyfrdg & Cadog Ward, FF/Dewl & Sawel Ward, SF/CCU, Acute Medical Admissions (AMU) & Towy Ward, TF / Alban & Padarn Wards
- 05 Core Block East - GF/Occupational Therapy, Physiotherapy & Cardiology, FF/ Intensive Care Unit, Chapel & Library, SF / Theatre Complex
- 06 Core Block West - GF/ X-ray, FF/Anaesthetics Offices, CSSD & Pharmacy, SF/Theatres & Labour Ward.
- 07 GF / Main Stores & EBME, FF / Main Kitchens & Restaurant
- 08 GF / Outpatients, Casualty, Audiology, Medical Records, Haematology
- 09 WRS Cafe, Clinical Coders FF / Pathology - Haematology / Bio Chemistry / NPHS
- 09 GF General Office, Personnel, Dietician, Training, Mortuary, Pharmacy
- FF / Management + Administrative Offices, Special Care Baby Unit (SCBU), IT
- 10 Old Nurses Home - GF / Administrative Offices, FF + SF + TF / Residential
- 11 New Nurses Home GF / Admin. Offices, Speech Therapy, Occupational Health, FF / Admin. Offices, Procurement, Finance
- SF + TF / Residential
- 12 GF / Residential + Seminar room
- 13 Sub Station
- 14 Boiler House
- 15 Laundry
- 16 Estates
- 17 Doctors Houses
- 18A Ty Glyndwr (P&D NHS Trust owned)
- 18B Ty Arthur (P&D NHS Trust owned)
- 18C Ty Hywel (P&D NHS Trust owned)
- 18D Ty Llewelyn (P&D NHS Trust owned)
- 19 Doctors Accommodation
- 20 Canolfan Gwili (P&D NHS Trust owned)
- 22 Renal Dialysis
- 23 Carmarthen Ambulance Station
- 24 Renal Research
- 25 Canolfan Gwenog (P&D NHS Trust owned)
- 26 Priory Day Hospital
- 27 Post Graduate Centre
- 28 Chemotherapy Day Unit
- 29 Interview Suite
- 30 Renal & Cardio Respiratory Unit
- 31 Accident & Emergency Unit
- 32 Endoscopy & Theatre



PROJECT	West Wales General Hospital, Glangwili, Carmarthenshire.	CLIENT Carmarthenshire NHS Trust	PLA1
		DESIGNER	PRP
		drawn by RWB	scale
TITLE	Master Site Plan Drainage Layout	checked by	date

Site Plan - Drainage Infrastructure

2.11 Civil & Structural Engineering: Topography & Geology

The site is generally around 20mAOD, yet the land slopes steeply beyond the residential estate to the north.

The site is generally around 20mAOD, but there is a drop of a few meters in elevation across the site, falling from north to south, with a steep fall to the A40 and a public footpath to the south of the site. The land slopes steeply beyond the residential estate to the north



Site Plan - Topography

2.12 Civil & Structural Engineering: Flood Risk

Rivers/Tidal – The Natural Resources Wales plan shows the site to be within flood zone 1 which indicates that the risk of flooding from rivers or tidal waters risk is low.

Surface Water – The majority of the site has a low risk of surface water flooding, however the Natural Resources Wales mapping shows that there are pockets of medium and high risk across the site. The most extensive area of high risk is within the car park outside the main hospital entrance and around the south of this wing.



Site Plan - Flood Risk Assessment Map

2.13 Existing Structures

External condition

Many of the main hospital buildings at GGH were built during the 1950's and are three storeys high. The buildings have a precast concrete frame and floor structure, with facing brickwork cavity wall or curtain walling facades. Profiled metal pitched roof and plant room enclosures were built over the original flat roofs during the 1980's.

Investment in the site during the 1990's included development of new EMI Unit (Morlais Ward), day hospital, and day theatre facilities, as well as office and administration facilities. Further investment in the 2000's included the construction of Chemotherapy, Emergency Unit, Clinical Decisions Unit, Renal Dialysis, Cardio Units and a mortuary.

- These later developments are built using a variety of construction methods which include:-
- Traditional load bearing construction with facing brickwork cavity walls
 - Steel frame with lightweight external wall panels and either facing brickwork, rain screen, render, or laminate panel cladding, or aluminium framed curtain walling
 - Volumetric modular units

Overall the frame and floor structures are operationally sound, with minor repairs required. The principle on site issues as captured within the Backlog database and Risk Register are listed below:-

- Single glazed steel framed curtain walling and window systems are reaching the end of their functional life, and require major repairs or replacement.
- Profiled metal pitched roofs and plant room enclosures are operationally unsound and in need of replacement. Internal gutters and roof sheeting have corroded in many areas and are allowing water to penetrate the roof space and clinical accommodation below. Supporting steelwork is also corroding, and fascias and soffits have become unsound in some areas as a result of the water ingress.
- Flat roof coverings and roof lights over the residential blocks, out patients block, and laboratories have poor insulation values and are reaching the end of their functional life, and require replacement.

- Teilo building (modular) is nearing the end of its functional life and will require major repair or replacement in the near future.
- The drainage infrastructure is coming to end of its functional life. Whilst significant investment is being made to the horizontal routes located within the subterranean ducts and vertical risers. Internal primary rainwater and foul drainage pipe work is operationally unsound, with leaking joints and internal corrosion that causes frequent blockages. Both require major repair or replacement. Secondary foul drainage networks vary in age, type and condition, and many require repair or replacement.

Internal condition

Unlike the exterior there are many parts of the internal fabric that have benefited from refurbishment or improvement works. Original partition walls are of masonry construction with plastered finishes and painted decoration, otherwise partitions are of lightweight construction with plasterboard linings fixed to a timber or metal framework. There are demountable, part glazed, metal framed partitions to ward bedrooms.

The internal fabric and finishes are generally in fair condition but showing signs of fatigue, with localised areas of impact damage, and water damage caused by leaking roofs and windows.

- The main areas of concern are as follows:-
- There are unsuitable floor finishes in some areas which require replacement. Moderate cracking in some areas needs repairing.
 - Suspended ceilings in some areas require major repair or replacement.
 - Many internal door openings are too small for modern equipment, wheelchair users, and people with mobility aids. They also show significant signs of wear and tear, and are in need of replacement. Ironmongery is also often unsuitable and requires replacement.
 - Floor finishes and sub floors in the theatre suite require replacement.
 - Many fixtures and fittings, including storage units and nurse bases, are damaged, in poor condition, fatigued, or unsuitable for modern equipment and computer use, and require replacement.

External works

The internal road network, visitor and staff car parks are macadam surfaced and generally in fair condition, with localised ponding and minor repairs required.

Footpaths have macadam, precast concrete flag, in-situ concrete, or concrete block paving. Principal access routes are generally in fair condition, with level and even surfaces and minor repairs required. Secondary routes, such as those used for maintenance or occasional access, are more inclined to have uneven surfaces, or broken paving.

2.14 Site: Fire Assessment

In April 2020 following a site inspection of Glangwili Hospital, The Mid and West Wales Fire and Rescue Authority (MWWFRA) issued an enforcement notice (KS/890/06 dated 17 April 2020) requiring the Health Board to implement a number of specific changes before October 2020. The enforcement notice was issued due to failure to comply with provisions of the Regulatory Reform (Fire Safety) Order 2005 because people were unsafe in case of fire.

In order to maintain the safety of staff, patients and visitors to the Wthybush site, the UHB are required to comply with the MWWFRA fire enforcement notices. Failure to comply could result in prosecution and potentially an enforced closure of buildings.

Following the issue of the notices the UHB agreed with MWWFRA a series of actions which prioritised essential works required to be addressed immediately. These included clearing obstructed fire escape routes, maintaining fire doors and emergency lighting and testing dry riser systems.

Other items from the list of improvements required by the fire notice included repairs to existing compartmentation construction, replacement of fire resisting doorsets and fire dampers.

Replacement of these items requires significant investment and the UHB have engaged a supply chain partner through the Designed for Life framework to investigate the requirements in more detail and prepare an outline business case for the remedial works.

The Outline Business Case identified work as two separate phases depending on priority to life safety. Phase 1 focusses on completing upgrades to all 1-hour fire compartmentation including fire doors and fire/smoke dampers and works to escape routes. Phase 2 covers upgrade to 30 minute sub-compartment walls, including fire doors and fire dampers and hazard room construction.

The business justification case for phase 1 was approved in November 2021 and works are currently progressing on site with construction due for completion in April 2023. The business justification case for phase 2 is due for submission in October 2022 and construction is due to start in January 2023

2.15 Opportunities and Observations

The Current (2020) Health Board Annual Report identifies a number of key projects at the Glangwili site to address specific clinical needs including:-

- Women’s and Children’s services phase 2 (2022/23)
- Pathology Services Refurbishment
- Proposed Fluoroscopy Room
- Junior Doctors Residential Refurbishment
- HSDU Refurbishment
- Fire upgrade works (compartmentation and fire door replacement)

Buildings on the site have a range of conditions and functional suitability although many of the buildings which are older and in a poorer state of repair are those which are embedded at the heart of the site and surrounded by newer buildings making them more difficult to refurbish or redevelop whilst maintaining the current clinical services. Any refurbishment works will present an opportunity to assess the energy performance of the existing buildings and consider opportunities to incorporate low carbon technologies to support a move towards net zero carbon. This may include new engineering services plant and infrastructure as well as upgrades to the building fabric.

As part of a wider site redevelopment strategy there may be an opportunity to demolish or re-develop some of the peripheral buildings around the site. These developments could help expand the current clinical services in modern fit-for-purpose accommodation, or provide opportunities for other health related services. These developments could also enhance the character of the site, creating landscaped areas to enhance the wellbeing of patients and staff and improve staff retention.

The adjacent development of the Gwili railway station may also provide an opportunity to create a direct link to a new public transport interchange.

A separate Programme Business Case has been developed to look at the completion of critical backlog maintenance on all of the Health Board sites with a view to maintaining business continuity during the development and delivery of this Programme Business Case. This detail will help informing the development of the Building Engineering Services strategy moving forward. It may be that some maintenance activities are deferred in favour of new developments.



Site Plan - Opportunities

3.1 Summary of High Level Brief

The Health Board ten-year health and care strategic vision (“A Healthier Mid & West Wales: Our Future Generations Living Well”) sets out the strategy for whole system change following the outcome of its previous public consultation exercise in November 2018.

The strategy describes the commitment to work in an integrated way across health and social care at a local and regional level, placing significant emphasis on the people and communities which access services provided by the Health Board.

During the initial consultation phase the Health Board identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported:-

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision and health outcomes across the three counties, for example there is a 10-year gap in healthy life expectancy across the area.

The consultation phase culminated with the Health Board describing a future model of care based around a network of integrated health & wellbeing centres and community hospitals which will bring key services and staff together in one place and provide virtual links between the local population and specialist services at the acute hospital sites.

The estate strategy which supports this model of care, known as ‘Proposal B’ considers the future transformation of the acute hospital estate and the associated implications on the community infrastructure. It includes provision of a new urgent and planned care hospital in the south of the region which will centralise all specialist children and adult services. The hospital sites at Withybush and Glangwili will be repurposed as community facilities with beds. Prince Philip and Bronglais hospitals in Llanelli and Aberystwyth will remain as general hospitals with refurbishment works as necessary to support the overall changes to the service model.

The proposed changes create significant opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce.

The findings from the phase 1 consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.

Through the development of the briefing information the Health Board have identified a range of service transformation scenarios which are primarily driven by assumptions on future bed numbers. These are described as follows;

‘Do nothing scenario’ where the current service is retained with no major reconfiguration or transformation.

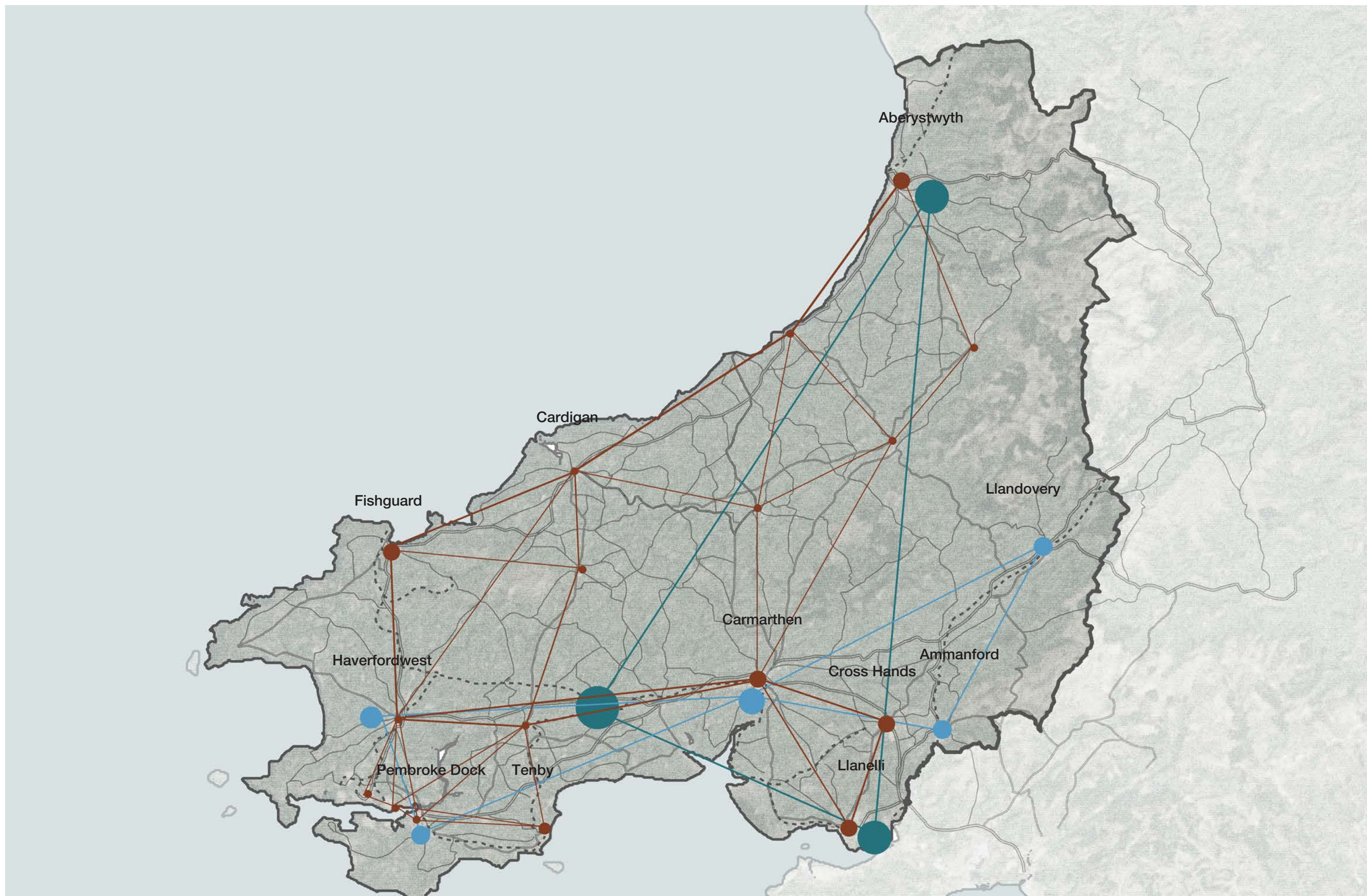
‘Do minimum scenario’ where the current service is retained with minor transformation of services to align with the AHMWW strategy and with focussed investment in new community projects and to bring the acute hospital estate up to Condition B.

‘Minimum efficiency scenario’ where Services are transformed to align with the AHMWW strategy based on pessimistic design assumptions. This scenario assumes a higher number of retained beds with increased retention of beds on the community sites and minimum numbers transferred to the new Urgent & Planned Care Hospital. This scenario also assumes the retention of day surgery at both Glangwili and Withybush.

‘Likely efficiency scenario’ where services are transformed to align with the AHMWW strategy based on a “most likely” set of design assumptions to determine a reduction in bed requirements generally with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites.

‘Maximum efficiency scenario’ where Services are transformed to align with the AHMWW strategy with more ambitious design assumptions applied. The scenario minimises the requirement for beds at the Urgent & Planned Care Hospital and on the associated community sites.

The impact of the various efficiency scenarios on the Glangwili site is considered in more detail on the following pages.



Proposal B: Network of proposed acute and community sites

4.1 Summary of Estate Development Options

In the future the Withybush Hospital site will operate as a community hospital. Beds will be therapy and nurse led, focusing on rehabilitation and less acute needs (step up from the community /step down from the acute hospital). There will be access to diagnostics and general outpatient clinics with more specialist assessments taking place at the Urgent and Planned Care Hospital.

A summary of the key functional content as described in the high level service brief is as follows;

- 24/7 GP led urgent care centre;
- Therapy and nurse led step up and step-down beds (less critical needs or rehabilitation);
- Outpatient clinics and specialist ambulatory ‘hot’ clinics;
- Facilities for an identified range of day case procedures;
- Midwife led units;
- Access to diagnostic support (x-ray, ultrasound, mammography);
- Renal Dialysis and Chemotherapy.

The service narratives and schedules of accommodation which have been developed to support the programme business case describe the proposed operational and spatial requirements in further detail. Some key elements of the brief are as follows;

- Providing facilities which support the Health Boards vision to be safe, accessible, sustainable and kind
- Achieving design standards set out in Welsh Health Building Notes and Welsh Health Technical Memoranda.
- Protecting patient privacy and dignity
- Supporting efficient flows
- Providing appropriate and logically placed support facilities for staff and patients (zonal hubs)
- Ensuring facilities are both accessible and inclusive
- Maximising the potential for flexibility and future adaptation.

Although the above summary describes the key functional content proposed for the Glangwili site in the future, the Minimum, Likely and Maximum service transformation scenarios describe slight differences in the level of service provision.

For example, the minimum service transformation scenario assumes the retention of seven 24-bed inpatient wards on the site along with two day-theatres and an endoscopy suite. To support this model a

sterile service unit and pathology department will also be retained on the site.

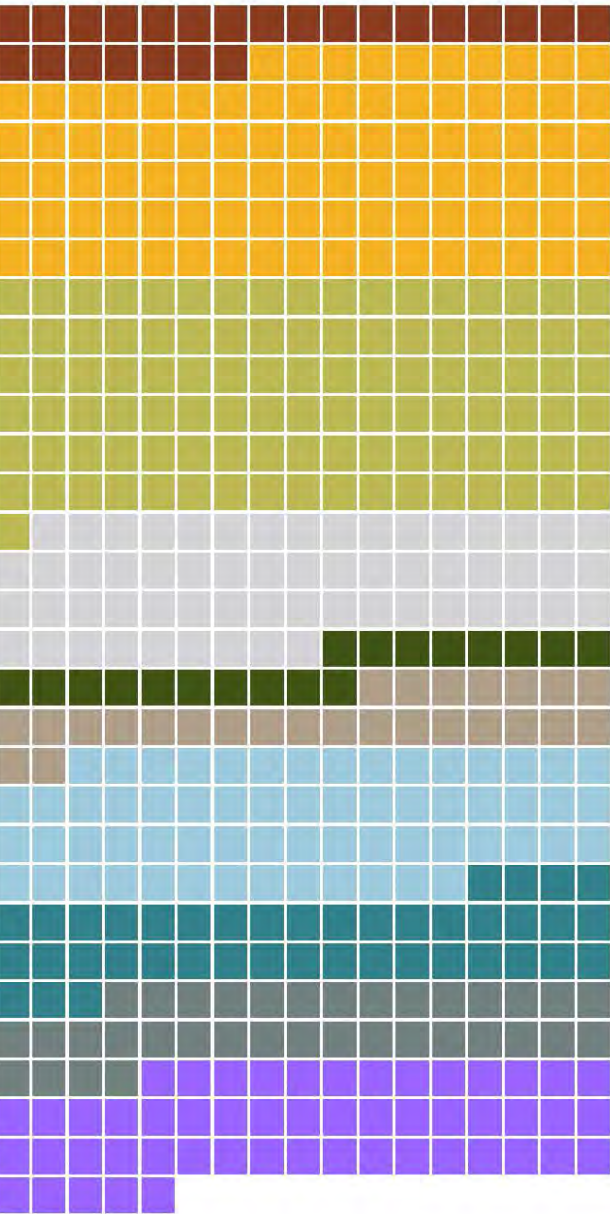
The likely scenario assumes a reduction to four 24-bed inpatient wards on the Glangwili site with all day surgery activity relocated to the new Urgent and Planned Care centre along with a subsequent reduction in clinical support spaces.
The maximum service transformation scenario assumes the same level of service provision as for the likely scenario.

The potential impact on the estate footprint at Glangwili is significant with a reduction in required area of between 60% and 70% based on schedule of accommodation version 2.2. This offers the potential to either reduce the estate footprint or to collocate other functions in the future such as community health & wellbeing facilities, mental health services or accommodation for partner organisations such as the Local Authority or third sector groups.

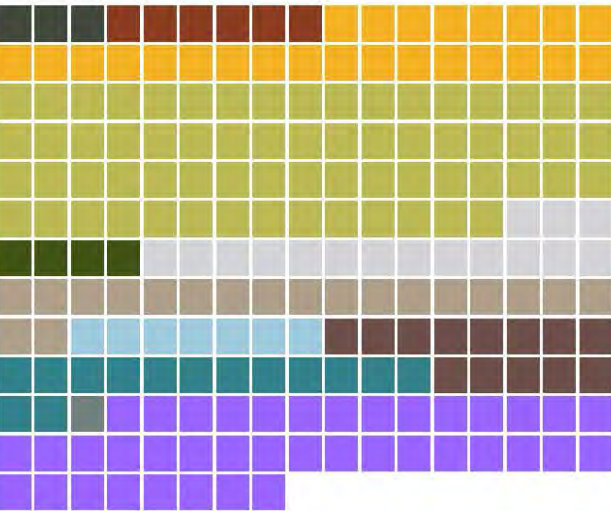
For each of the service transformation scenarios at the Glangwili site the Programme Business Case considers options for either refurbishment of the existing estate or a new purpose built facility on the site. The estate options have different implications in terms of cost, implementation programmes and compliance.

The range of estate solutions are described in greater detail on the following pages.

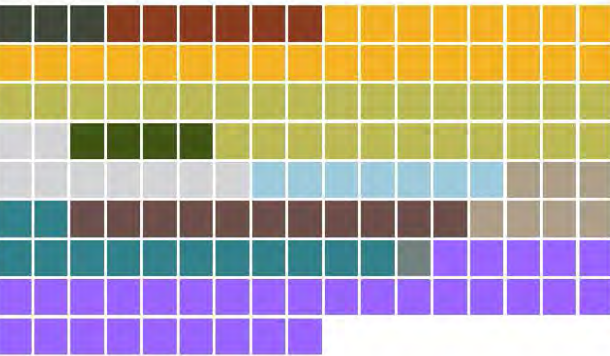
Existing GIA 51,294sqm



Minimum GIA 21,964sqm⁺



Likely GIA 14,515sqm⁺



- 1 square = 100sqm
- 1.0 Main Entrance Facilities
- 2.0 Emergency Portal
- 3.0 Ambulatory Care
- 4.0 Inpatient Beds
- 5.0 Interventional Suites
- 6.0 Mental Health
- 7.0 Clinical Support
- 8.0 Administration and Education & Training
- 9.0 Staff & Visitor Welfare
- 10.0 Facilities Management
- 11.0 External and Ancillary Areas
- 12.0 Residences
- 13.0 Communication & Plant

1. Existing areas based on 2021 EFPMS data
2. Proposed areas based on SHP schedule of areas dated 06/10/21
3. Comparison of functional zone areas in existing is approximate

4.2 Minimum Scenario: Project 4a

Project 4a is based on a refurbished solution at the existing Glangwili site

The minimum transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The minimum scenario also includes seven 24-bed inpatient wards, two day theatres and an endoscopy suite. Different to the other scenarios on the Glangwili site this option also includes a larger pharmacy department, a sterile services unit and pathology suite.

The total briefed area for this option is 21,965sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

The solution is based on the retention of circa 20,000sqm of the existing estate, namely blocks 20 (renal) and 26 (day hospital) which are both condition B, and blocks 3, 4 and 9 which are all part of the original build, and condition C. The retained estate also includes the new women's and children's block which connects blocks 3, 4 and 9 on multiple levels. A new entrance area, two vertical circulation cores and engineering space will be required which will bring the total area up to 22,000sqm.

The ground floor includes a mix of minor injuries, mental health, ambulatory care and clinical support and FM. The first floor features three inpatient wards with a total of 80 beds along with the intervention suites, clinical support and plant space. The second floor two inpatient wards with a total of 56 beds. The third ground floor includes one 32 bed inpatient ward.

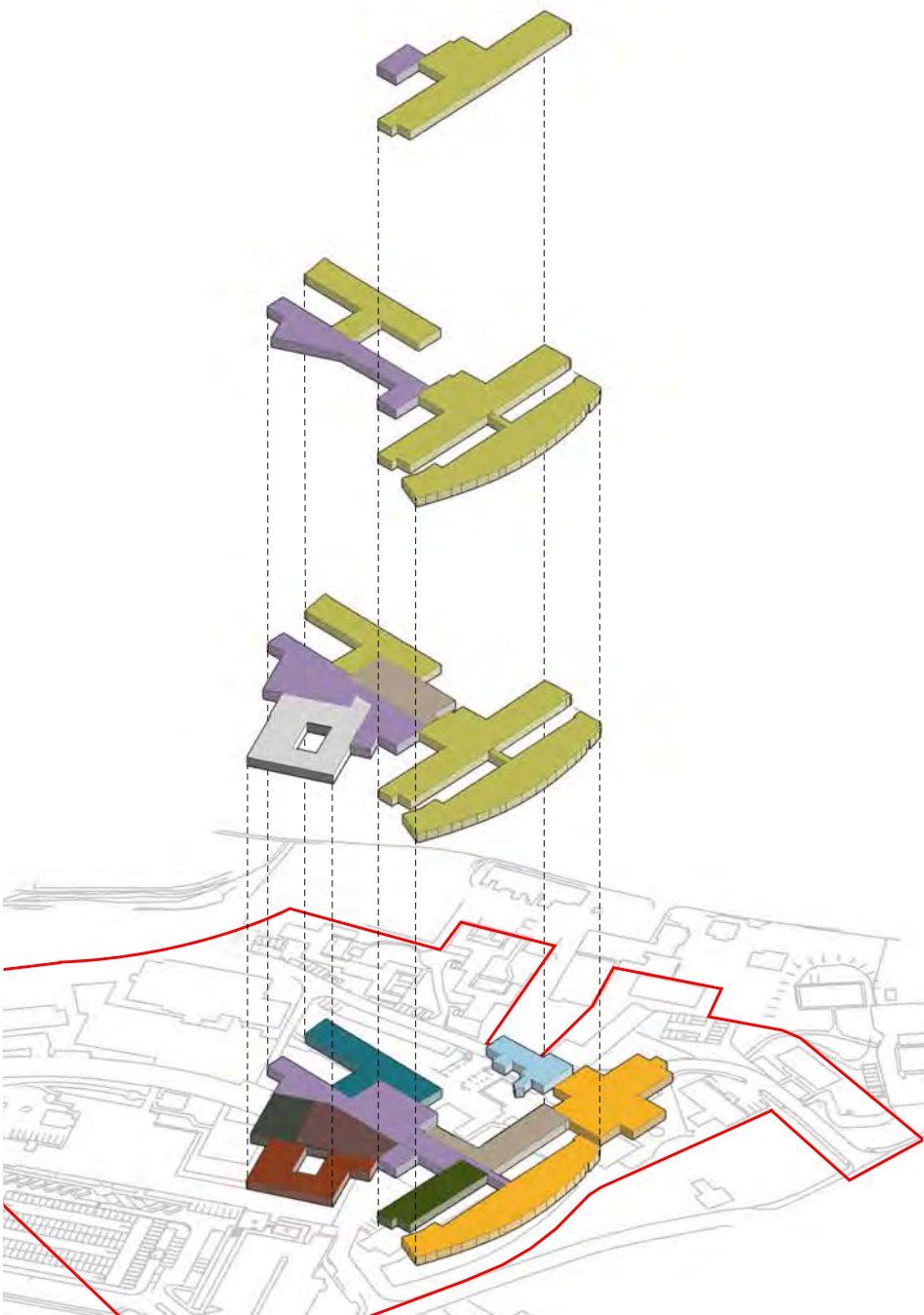
The retained buildings provide more space than required by the brief but this ensures the potential for a greater degree of compliance when compared to Health Building Note standards.

The condition of the existing blocks is poor and therefore this option assumes that blocks 3, 4 and 9 will receive new external cladding while all areas will receive new internal fabric and full replacement of the engineering infrastructure. The viability of this solution will need to be tested further at the Outline Business Case stage

Based on the size of the existing estate and the proposed retained area there is the potential for this project to be delivered in a single phase without the need for additional decant space. This solution will require some temporary engineering infrastructure to allow the retained estate to remain operational during the refurbishment works.

This project can only be delivered following the opening of the new Urgent & Planned Care Centre and the relocation of services away from the Glangwili site.

On completion the remainder of the unused estate will need to be demolished and this will include some buildings which were built within the last 10 years. With a reduction in the building footprint and less car-parking required there is the potential to dispose of circa 15 acres in the future.



Project 4a stacking diagram



Project 4a third floor

Project 4a second floor

Project 4a first floor

Project 4a ground floor

4.3 Minimum Scenario: Project 4b

Project 4b is based on a new build solution on the existing Glangwili site

The minimum transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The minimum scenario also includes seven 24-bed inpatient wards, two day theatres and an endoscopy suite. Different to the other scenarios on the Glangwili site this option also includes a larger pharmacy department, a sterile services unit and pathology suite.

The total briefed area for this option is 21,965sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

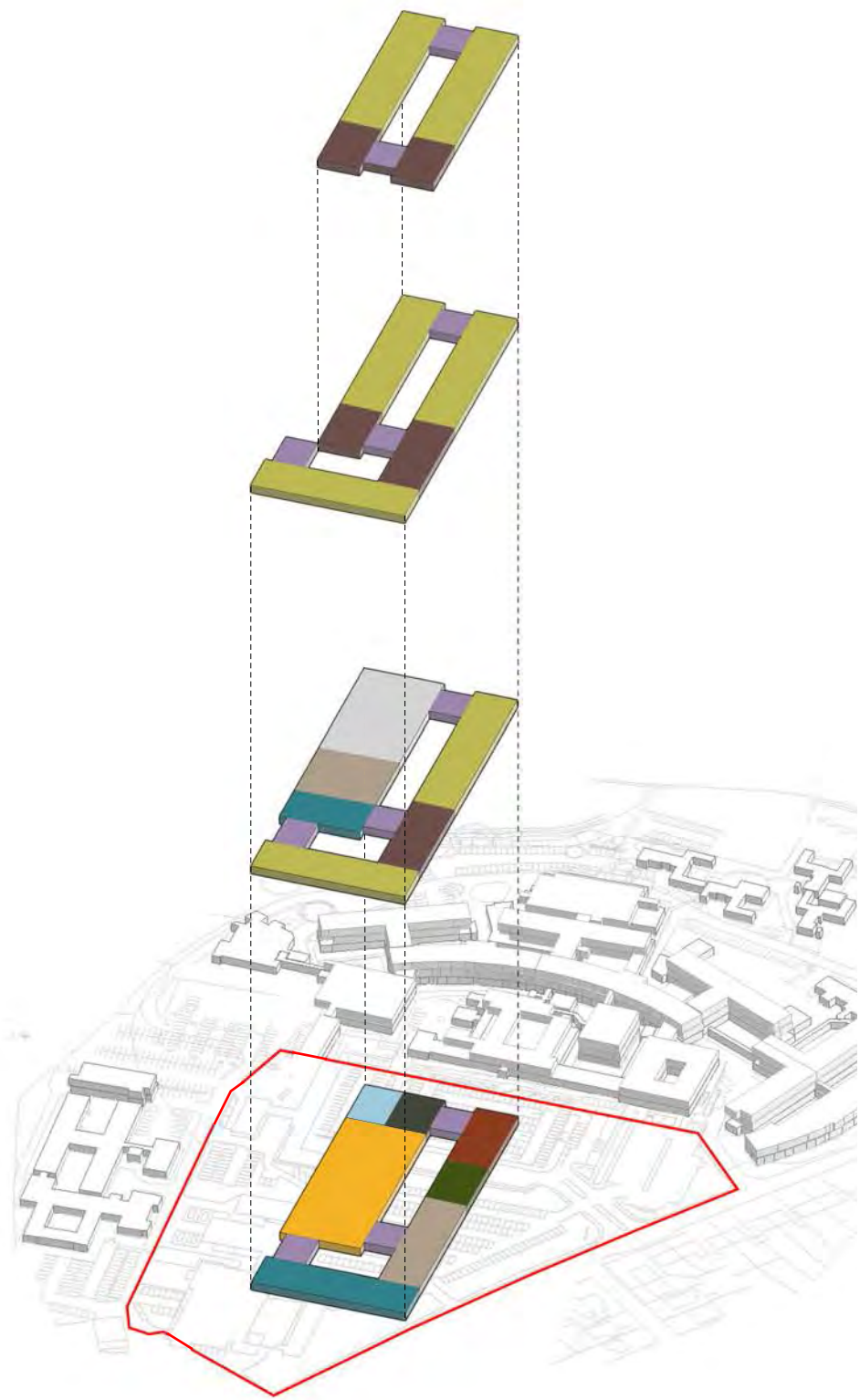
The solution suggests a 4-storey building located on the site of the existing public car park and estates department which will be vacated and demolished prior to commencing construction work. The adjacent boiler house will need to be retained and protected during the construction phase. The proposed ground floor footprint is circa 6,500sqm.

The larger central block includes the main entrance, admin and ambulatory care on the ground floor, with the intervention suites clinical support and FM space on the first floor. The narrow plan block includes the minor injuries unit, mental health, clinical support and FM accommodation on the ground floor, and two 24-bed wards with welfare accommodation on the first floor. On the second and third floors there are two further 24-bed wards with welfare areas. Engineering plant will be located on the roof of the wards.

If sited appropriately this project could be delivered while the existing hospital remains live. Project 4b can be delivered independently of the wider estate upgrades including the new Urgent & Planned Care Centre.

The existing hospital access on Dolgwili Road can be retained for the new development avoiding the need for disruptive highways works. The existing car park zones can be retained but will require reconfiguration and additional landscaping.

The suggested site area for the new hospital is approximately 7.5 acres and on completion the remainder of the site can be disposed with a potential site access further to the south on Dolgwili Road.



Project 4b stacking diagram



Project 4b third floor

Project 4b second floor

Project 4b first floor

Project 4b ground floor

4.4 Likely Scenario: Project 4c

Project 4c is based on a refurbished solution at the existing Glangwili site

The likely transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The likely scenario also includes three 24-bed inpatient wards.

The total briefed area for this option is 15,548sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

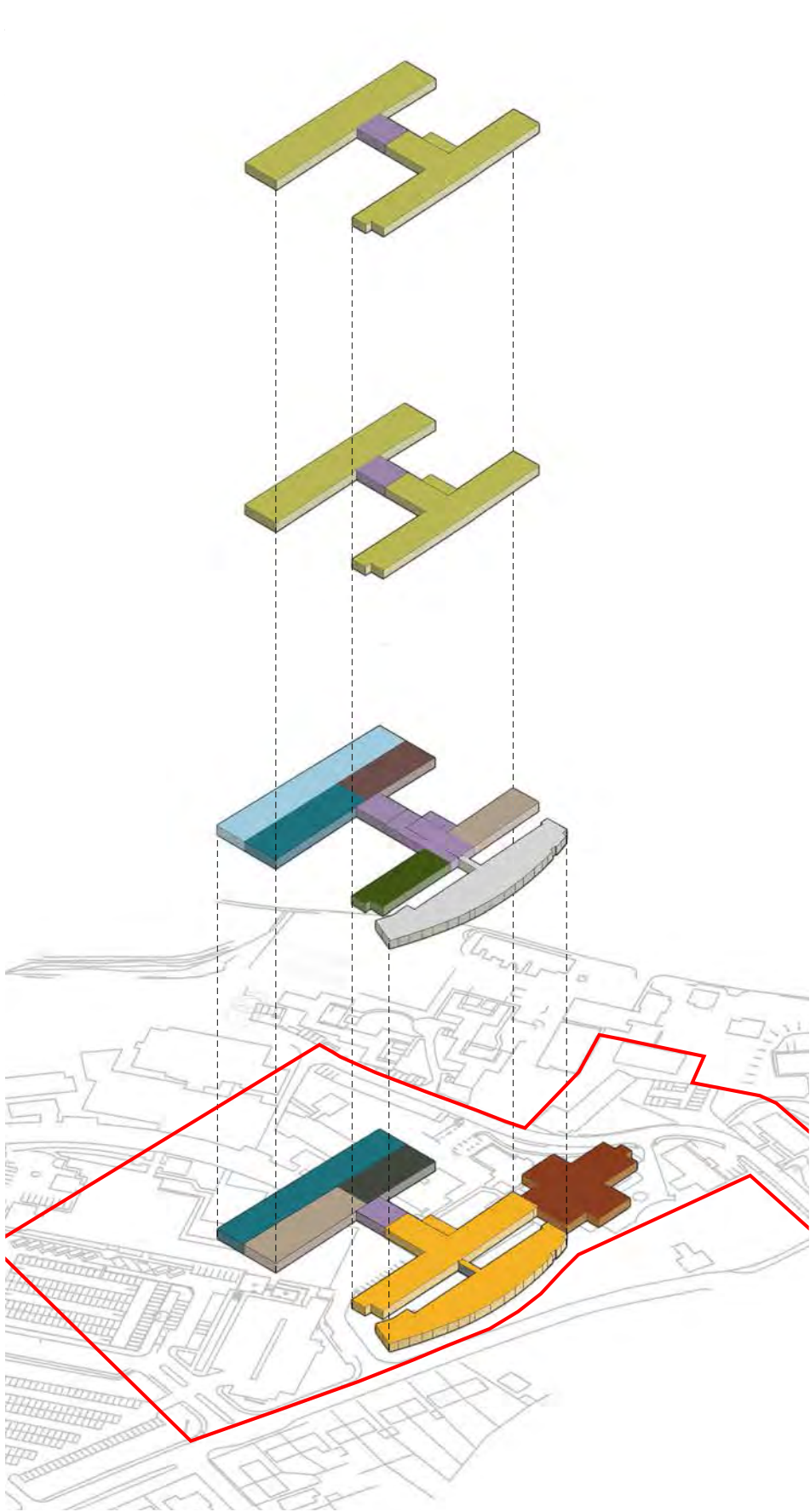
The solution is based on the retention of circa 8,150sqm of the existing estate, namely blocks 20 (renal) and 26 (day hospital) which are both condition B, and block 4 which is part of the original build, and condition C. The existing buildings include ambulatory care and minor injuries on the ground floor, intervention suites, clinical support and mental health on the first floor and inpatient areas on levels two and three.

This option also includes a new build 8,000sqm four storey clinical block which houses the main entrance, clinical support and FM on the ground floor, Admin and welfare on the first floor and two floors of inpatient areas which link into block 4. A new vertical circulation core will be constructed between the old and new blocks.

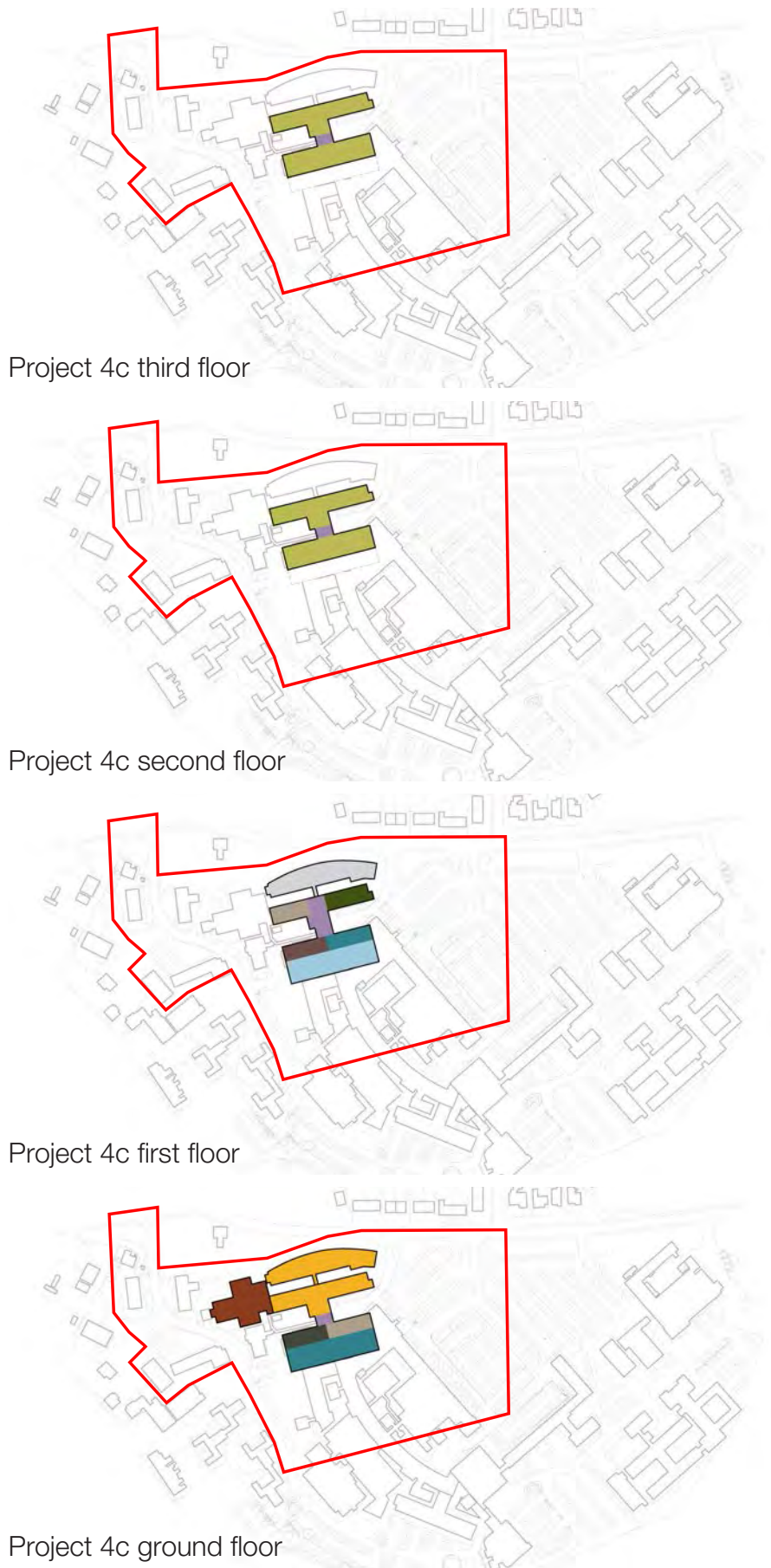
This solution provides slightly more space than required by the brief but this ensures the potential for a greater degree of Health Building Note compliance in terms of space standards and spatial relationships.

The condition of block 4 is poor and therefore this option assumes that this area will receive new external cladding while all areas will receive new internal fabric and full replacement of the engineering infrastructure. The viability of this solution will need to be tested further at the Outline Business Case stage.

Based on the size of the existing estate and the proposed retained area there is the potential for this project to be delivered in a single phase without the need for additional decant space. This solution will require some temporary engineering infrastructure to allow the retained estate to remain operational during the refurbishment works.



Project 4c stacking diagram



Project 4c third floor

Project 4c second floor

Project 4c first floor

Project 4c ground floor

4.5 Likely Scenario: Project 4d

Project 4d is based on a new build solution on the existing Glangwili site

The likely transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The likely scenario also includes three 24-bed inpatient wards.

The total briefed area for this option is 15,548sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

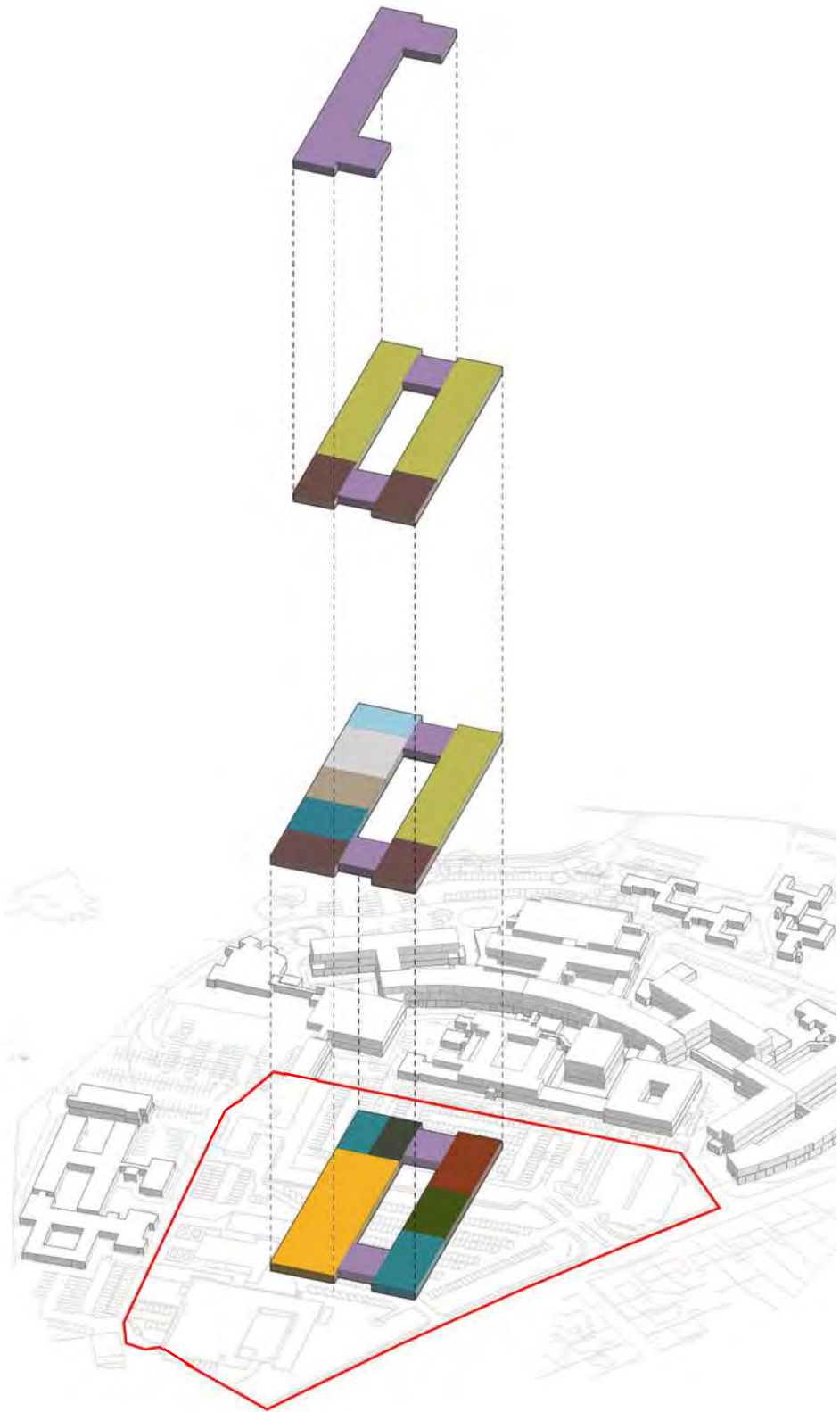
The solution suggests a 3-storey building located on the site of the existing public car park and estates department which will be vacated and demolished prior to commencing construction work. The adjacent boiler house will need to be retained and protected during the construction phase. The proposed ground floor footprint is circa 5,000sqm.

The larger block includes the main entrance and ambulatory care functions on the ground floor, with the intervention suites, offices, clinical support and FM space on the first floor. The narrow plan block includes the minor injuries unit, mental health and FM accommodation on the ground floor and a 24-bed ward with welfare accommodation the first floor. On the second floor there are two further 24-bed wards with welfare areas. Engineering plant will be located on the roof of the wards.

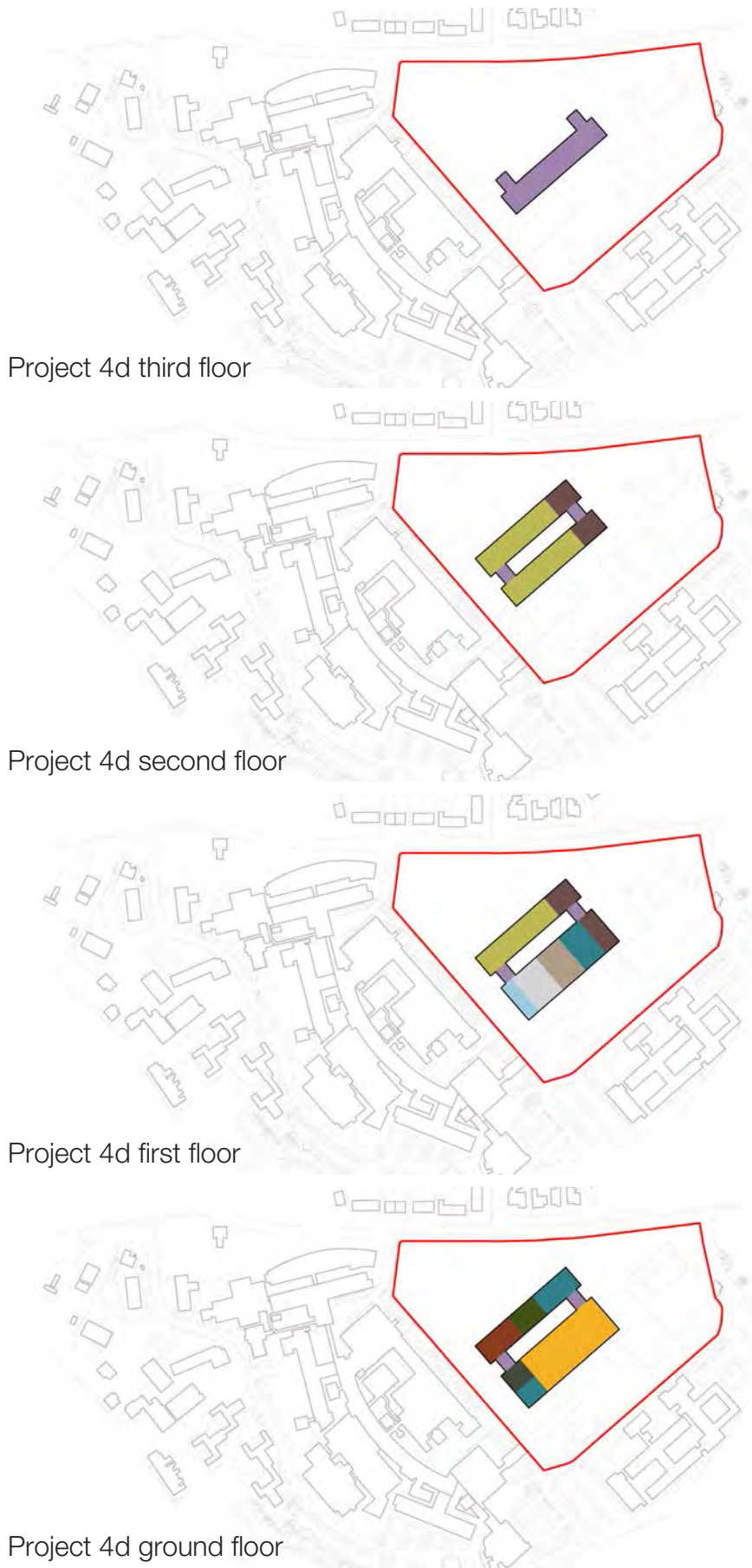
If sited appropriately this project could be delivered while the existing hospital remains live. Project 4b can be delivered independently of the wider estate upgrades including the new Urgent & Planned Care Centre.

The existing hospital access on Dolgwili Road can be retained for the new development avoiding the need for disruptive highways works. The existing car park zones can be retained but will require reconfiguration and additional landscaping.

The suggested site area for the new hospital is approximately 7.5 acres and on completion the remainder of the site can be disposed with a potential site access further to the south on Dolgwili Road.



Project 4d stacking diagram



Project 4d third floor

Project 4d second floor

Project 4d first floor

Project 4d ground floor

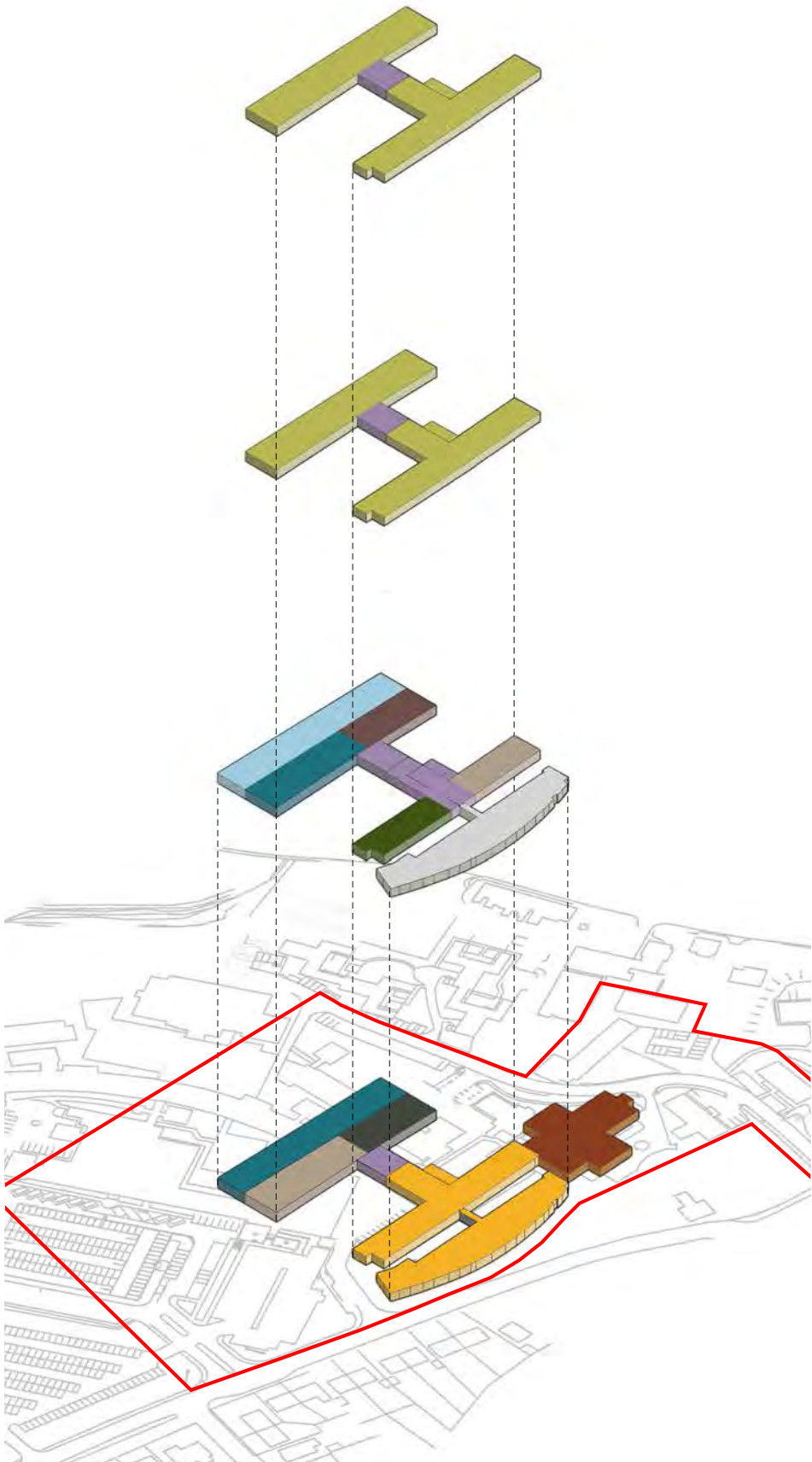
4.6 Maximum Scenario: Project 4e

Project 4e is based on a refurbished solution at the existing Glangwili site

The maximum transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The maximum scenario also includes three 24-bed inpatient wards.

The total briefed area for this option is 15,548sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

The solution for the maximum transformation refurbished option is identical to the likely option described on the previous pages.



Project 4e stacking diagram



Project 4e third floor



Project 4e second floor



Project 4e first floor



Project 4e ground floor

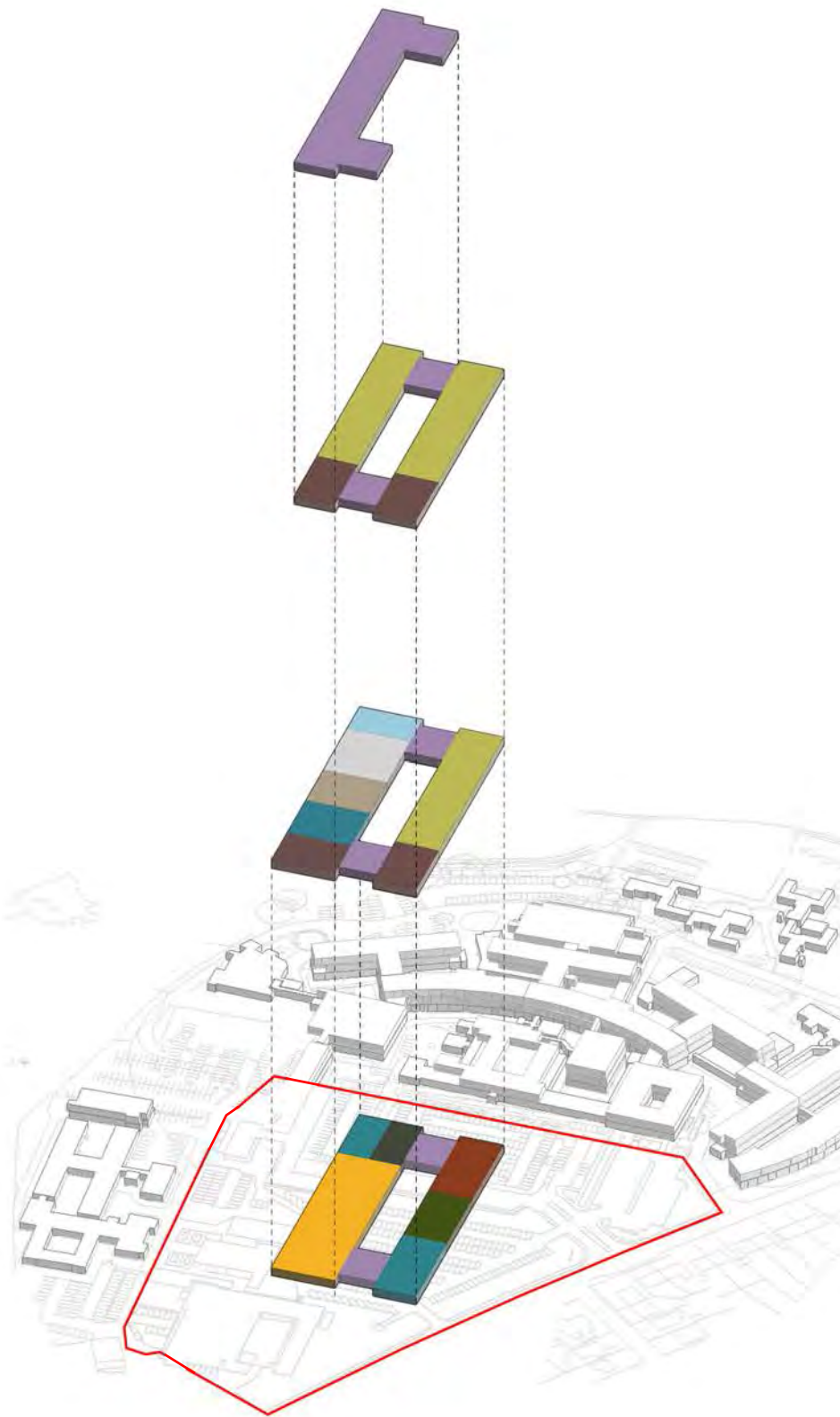
4.7 Maximum Scenario: Project 4f

Project 4f is based on a new build solution on the existing Glangwili site

The maximum transformation scenario describes a functional requirement at Glangwili which includes a minor injuries unit with GP out of hours service and satellite imaging, three outpatient clusters and 16 renal treatment chairs. The maximum scenario also includes three 24-bed inpatient wards.

The total briefed area for this option is 15,548sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

The solution for the maximum transformation new build option is identical to the likely option described on the previous pages.



Project 4f stacking diagram



Project 4f third floor



Project 4f second floor



Project 4f first floor



Project 4f ground floor

5.1 Engineering infrastructure

As noted in the minimum, maximum and likely scenarios, all services within the buildings will be being removed and replaced or new buildings are being provided. As previously noted in section 2 the existing infrastructure for the site is past its design life and due for renewal. We would suggest that this should be replaced as part of these works. Providing new infrastructure to the retained buildings, allowing the existing infrastructure to be removed on decommissioning of the remaining site.

In doing so, the estate can incorporate decarbonisation and ensure that the current WHTMs and WHBNs are incorporated. Fire compliance and appropriate sprinkler coverage can also be ensured as part of these works.

It should be noted that where existing structures are retained, there is likely to be challenges regarding mechanical ventilation of these spaces in accordance with the latest guidance. The existing buildings are mostly naturally ventilated and the original floor to floor heights and service voids do not take into account the ductwork requirements. Additionally, there is no allowance for the associated air handling units to be located in roof plant rooms. This will require careful consideration during any refurbishment works.

As the central main heating system is currently supplied by heavy fuel and this is due for replacement, we would assume that this would become redundant with the move to an all electric site in line with current decarbonisation plans. We would currently envisage a move to electric heat pumps (either ground or air sourced) linked to a district network serving the buildings.

The move to electricity as the primary fuel source for heating will increase the load on the incoming electrical supply. Further work will need to be undertaken to determine if the reduction in estate buildings and improvements in the electrical efficiency offsets the additional load or if more primary electrical infrastructure is required. The existing electrical supply arrangement will be reviewed against WHTM benchmarks to check that it provides the appropriate level of resilience.

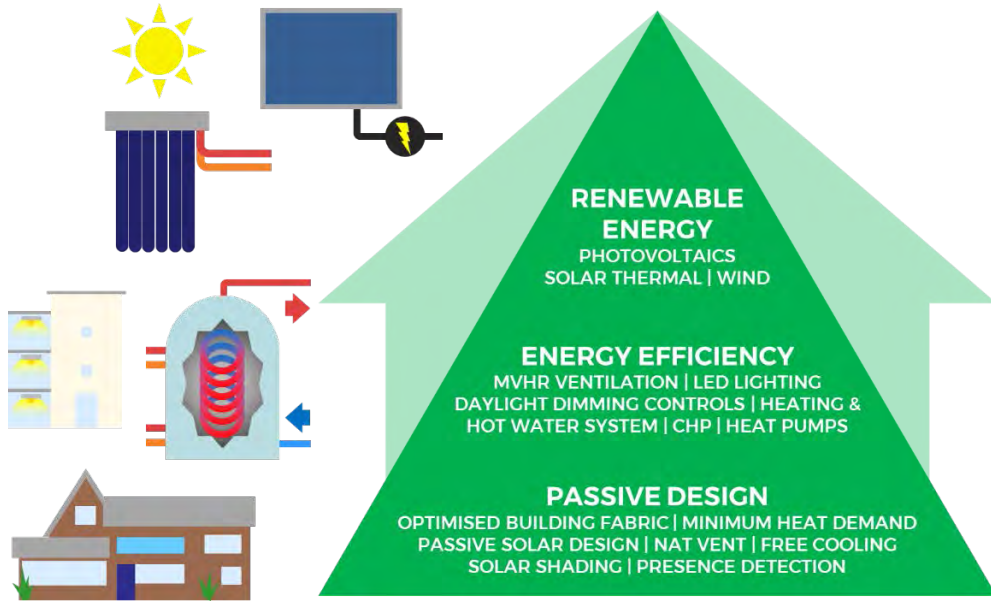
Energy Hierarchy

Generator back up of the electrical power will need to be provided to provide the appropriate level of resilience to the electrical system. New and refurbished buildings would look to minimise heat loss by maximising the thermal performance of the buildings. This will assist in reducing the energy requirements. New buildings would also incorporate photovoltaic panels (PVs) to offset energy use.

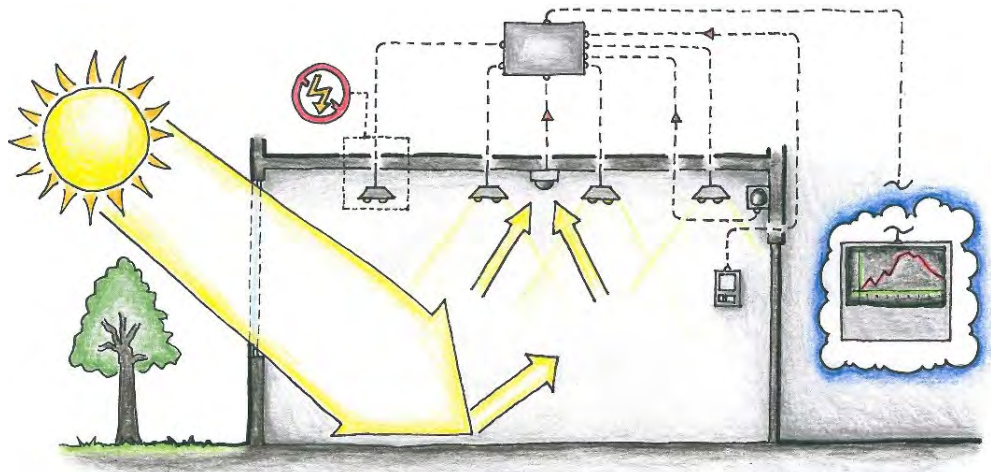
Automatic daylight controls

Incoming telecommunications will be reviewed for their suitability for continued use.

In the “do nothing” scenario, it should be noted that work will still need to be undertaken on the services to maintain the operation of the building. Significant amount of plant and services are at the end of their design life and due for renewal. Fire compliance work would also need to be undertaken to ensure that the building is meeting all statutory requirements.



Energy Hierarchy



Automatic Daylight Control

5.1 Engineering infrastructure

External works

The internal road network, visitor and staff car parks are macadam surfaced and generally in fair condition, and whilst minor repairs are required, it is likely that existing roads and car parking will be utilised where possible (perhaps resurfaced) within all re-development options – particularly as the required quantum of parking will reduce.

Civil & Structural engineering: Topography & Geology

Glangwili Hospital is positioned generally on relatively flat land and therefore whilst some earthworks will be required to form the floorplate of new build options 4b & 4d, it is not envisaged to be significant.

Civil & Structural engineering: Flood Risk

The Natural Resources Wales plan shows the site to be within Flood Zone 1 which indicates a low risk of flooding from rivers or tidal waters, and therefore no impacts are anticipated with any of the development options. Surface water flooding will be managed through the drainage design for each of the redevelopment options. Added care will be needed when planning/designing the location/level of the new build options which coincide with an area of high Surface water flood risk within the car park.

Civil & Structural engineering: Below ground drainage

Surface Water Drainage

Common impacts for Options 4a, 4b, 4c & 4d

All options include demolition of existing elements of the site and in this case there may be the need for some reconstruction/realignment/protection of the existing surface water/land drainage systems. The management of surface water runoff, both in terms of quantum and quality, would need to be considered in a holist manner such that flood risk is not exacerbated.

Impacts for Options 4a & 4c

The refurb will be internal and therefore changes to the Surface water drainage system are not necessarily required. It may however be desirable to rationalise the existing system, which will need to retain its connection to the existing land drainage system/watercourse to the south east of the site.

Impacts for Options 4b & 4d

The new build options will come with the requirement for SuDS design principles in accordance with Welsh Government’s Statutory Standards. This will generate the need for surface water treatment & attenuation prior to its discharge to either ground or as per the status quo to the existing land drainage system.

Foul Drainage

Common impacts for Options 4a, 4b, 4c & 4d

All options result in a reduction in foul flows discharging to the foul water drainage system and therefore whilst there may be some reconstruction/realignment/protection of the existing drainage systems, which would be done as part of the demolition works, no upgrades to the public sewerage system would be required.

Additional Impacts for Options 4a & 4c

The refurb options will come with the likely requirement to carry out maintenance works to extend the lifetime of the existing private/on-site foul drainage system. Should flows increase in a particular part of the drainage system then there may be the need for localised capacity upgrades.

Additional Impacts for Options 4b & 4d

The new build options will provide the opportunity to decommission much of the existing private/on-site foul drainage system and to provide a more efficient connection to the public sewer on the boundary of the site.

6.1 Implementation Strategy

High Level Implementation Strategy for Glangwili

The preferred way forward is to provide a new build solution to provide the new Community Hospital at Glangwili. Construction of the new Community Hospital is planned to be completed at the same time as the proposed Urgent and Planned Care Hospital enabling both to open around the same time maximising the ability to shift to the new model of care.

This approach provides a period of around 14 months for enabling works such as localised demolitions infrastructure alterations and service diversions to be undertaken to create the development zone for the new build development. This is dependent on creating sufficient space to allow the development whilst maintaining current services on the Glangwili site during construction.

The development zone for the new build solution utilises the existing public and staff car parks. This will require alternative parking solutions together with reconfiguration of the sites existing road infrastructure.

Site clearance works will also be required to demolish part or all of the existing residences (a proportion of which are actually office accommodation) and works and estates workshops and offices.

Laundry services are understood to be moving off site as part of the All Wales regional laundry service. Therefore, the assumption is that this will take place prior to the commencement of the new build allow the laundry to be demolished.

The existing Boiler House will be demolished and heating infrastructure for the existing hospital provided via an interim solution. This could either by temporary provision or via new energy centre with the long term purpose of serving the proposed Community Hospital

Solutions for these and any decant accommodation will be developed further during the outline business case stage.

A summary table of key milestones for a new build solution is included below:

Milestone	GGH (new build)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW framework)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Period of site preparatory/demolitions/ enabling works	July 2026 – July 2027
Start on site	August 2026
Construction Completion	End June 2029
Commissioning	July – October 2029
Opening	End October 2029
Disposal of surplus site area	2030

*Table based upon Implementation Option No. 1

Whilst a new build solution is the preferred way forward to develop the new Community Hospital a part refurbishment and new build solution has also been considered. Whilst this seems feasible such a development could not commence until the new Urgent and Planned Care Hospital is operational.

This approach provides a period of over 3 years for enabling works such as localised demolitions infrastructure alterations and service diversions to be undertaken to prepare the site for repurposing and a phased redevelopment.

Detailed sequencing of works has not been considered at this stage although the high-level assumption is that those services remaining at Glangwili would be provided within the accommodation planned for demolition whilst the remainder of the existing main hospital is repurposed and supplemented with new build extensions.

Following completion, the surplus accommodation across the site would be demolished allowing potential disposal of the existing site once car parking and landscaping works had been completed.

Alternatively, the surplus areas of the existing hospital site could be redeveloped for health related and other community uses.

Milestone	GGH (refurb)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW framework)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Period of site preparatory/demolitions/ enabling works	July 2026 – end 2029
Start on site	January 2030
Construction Completion	End March 2033
Commissioning	April and May 2033
Overall Opening and site completion	Summer 2033
Disposal of surplus site area	2033 onwards

*Table based upon Implementation Option No.'s 7 & 8

7.1 Planning

Town planning considerations (high level summary of planning considerations for future phases – pick up on policy issues and key constraints)

The hospital is located within the administrative area of Carmarthenshire County Council. The statutory development plan for the hospital site comprises the Local Development Plan 2006 – 2021 (Adopted December 2014).

A review of the LDP commenced in January 2018. The Delivery Agreement dated November 2020 states that the Local Development Plan 2018 – 2033 will be adopted in July - August 2022.

Local Planning Policy

The following adopted Local Development Plan 2006 – 2021 policies are considered to be particularly relevant to the site:

Policy GP1 Sustainability and High Quality Design

The policy indicates that development proposals will be permitted where they conform with a range of criteria to achieve high quality design covering matters including enhancing the character and appearance of the site, utilising appropriate materials and avoiding significant impacts on amenity of adjacent land uses, amongst other criteria.

Policy GP2 Development Limits

The policy states that “Development Limits are defined for those settlements identified as Growth Areas, Service Centres, Local Service Centres and identified Sustainable Communities within the settlement framework. Proposals within defined Development Limits will be permitted, subject to policies and proposals of this Plan, national policies and other material planning considerations.” The hospital site is bounded to the east by the Development Limits for Carmarthen.

Policy H1 Housing Allocations

Housing allocations GA1/h13, GA1/h14 and GA1/h15 are located to the north, south and south east of the Site respectively.

Policy TR4 Cycling and Walking

A proposed Cycle Route is located to the east of the hospital site. Under policy TR4 land required to facilitate this is safeguarded.

Policy TR5 Gwili Railway

The policy states that “Proposals which do not prejudice the following in relation to the Gwili Railway will be permitted:

- a. The extension of the Gwili Railway northwards to Llanpumsaint and southwards to the old station site in Carmarthen;
- b. The provision of new stations at Llanpumsaint and Glangwili, Carmarthen.”

The site for the new Gwili Railway Station is located on land to the east of the hospital The Gwili Railway is proposed for extension to the east of the hospital.

Policy MPP3 Mineral Safeguarding

The policy states that “Planning permission will not be granted for development proposals where they would permanently sterilise resources of aggregates and coal identified within the mineral safeguarding areas (areas of search) identified on the proposals map unless:

- a. The applicant can demonstrate that the extraction of the mineral is impracticable, uneconomic or environmentally unacceptable (including compromising amenity and social considerations); or
- b. The mineral resource has already been extracted; or
- c. The mineral can be extracted satisfactorily prior to the development taking place; or
- d. The development is of a temporary nature and can be completed and the site restored within the timescale that the mineral is likely to be needed; or,
- e. The nature and location of the development would have no significant impact on the potential working of the resource.”

Various parcels of land surrounding the hospital site are located within areas of sand and gravel mineral resource.

The Local Development Plan 2018 – 2033 would need to be considered prior to its formal adoption but afforded limited-moderate weight depending on how far it has advanced at the point of a planning application.



National Planning Policy

In terms of National Planning Policy, Future Wales: The National Plan 2040, Planning Policy Wales and Technical Advice Notes (TAN) would apply to the site.

Future Wales: The National Plan 2040

Future Wales is the National Development Framework for Wales, setting the direction for development in Wales to 2040. Future Wales is a spatial plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

Planning Policy Wales

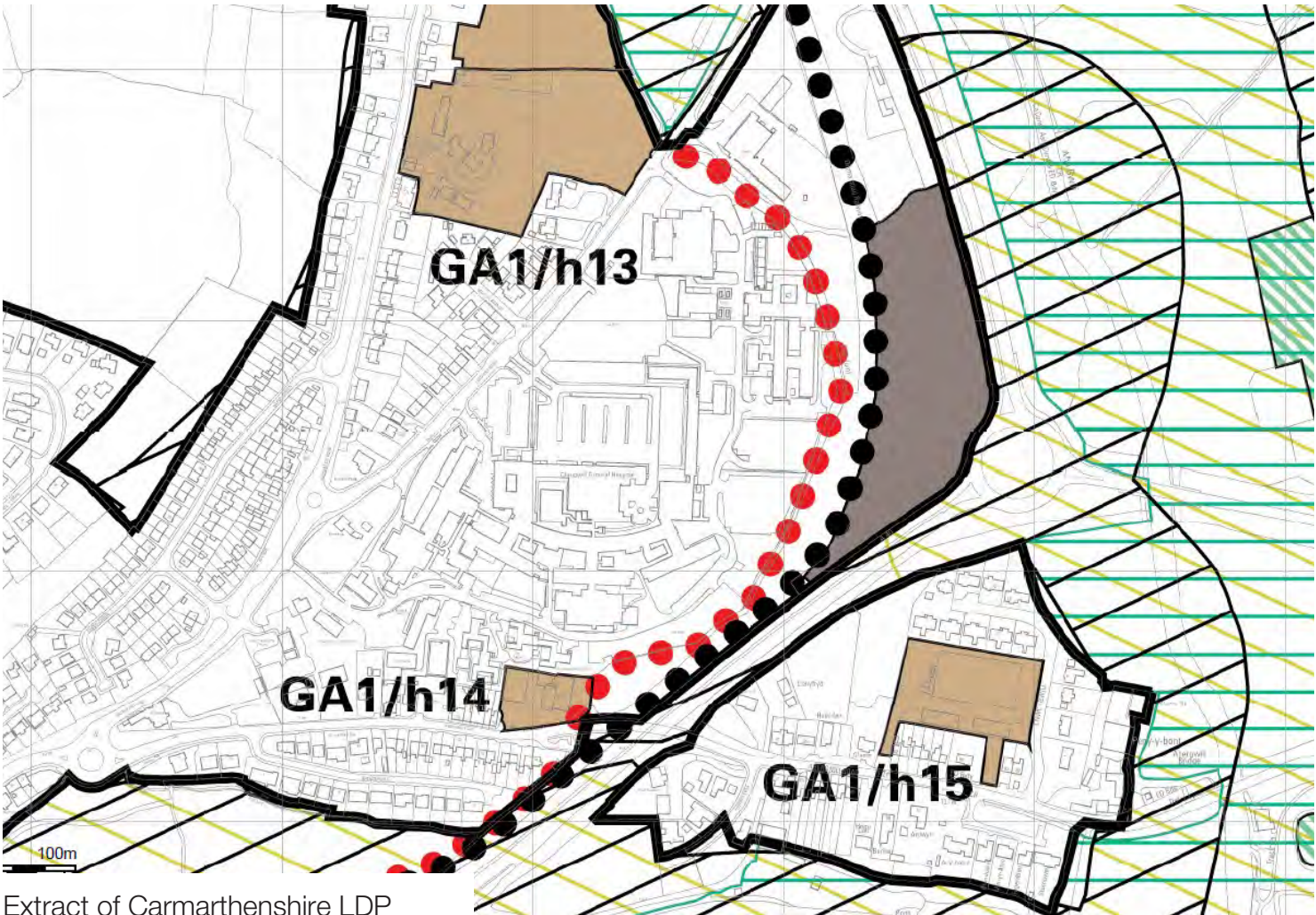
Planning Policy Wales (PPW) Edition 11 (February 2021) outlines the Welsh Governments land use planning policies. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

Technical Advice Notes (TANs)

TANs provide detailed planning advice to accompany Future Wales and PPW. In terms of Glangwili Hospital, the following TAN would be especially relevant:
TAN 12 Design

TAN 12 sets out design guidance for developers to adhere to, ensuring that sustainability through good design is promoted within the planning system. Guidance within this note would need to be considered at the design stage, including the production of a Design and Access Statement to accompany the planning application which is a requirement for any ‘major’ development in Wales, this is any development over 1ha.

Paragraph 5.10.1 states that “In the design of schools, hospitals and other buildings and infrastructure intended for use by the local community the aim should be to achieve fitness for purpose, value for money over the whole life of the building, and a positive impact on the lives of those who use it and on its surroundings.”



Extract of Carmarthenshire LDP

8.1 Cost Summary

Works Cost

The Glangwili Hospital New Build option comprises a new hospital and the closure of the existing hospital. The costs are based on an elemental cost per m2, and the traditional approach using DCAGs has not been followed. The rationale for this is that the DCAGs database has not been updated for a considerable time, and there have been several significant changes in both healthcare design standards and planning and building regulations requirements which render the DCAGs unreliable.

New Hospital Option

The basis of the elemental cost is the benchmark cost reports for similar schemes and the Grange Hospital elemental analysis, which takes account of a number of additional cost drivers including further regulatory change and design aspiration, as follows:

- BREEAM 2018 in lieu of BREEAM 2014 – addition 0.75%
- Decarbonisation aspirations – addition 3%
- SMART costs – addition 1% (see Non-works costs for impact on IT costs)
- Biophilic Design aspirations – addition 2%
- Location – addition 2%

The percentage additions were derived from various sources and also take account of the area in which the developments will be built.

Refurbishment Option

The refurbishment option includes for a large extension and refurbishment of the existing building. The basis of the elemental cost for the new build extension is the benchmark cost reports for similar schemes, as above. The basis of the elemental costs for the different types of refurbishment works is benchmark costs, developed using an extensive database of costs, as above. The elemental costs are then adjusted to reflect the scope of the proposed refurbishment works. Major and moderate refurbishment costs are included.

External Works (Oncosts)

The new build option establishes an indicative site area to be retained with the residual area available for disposal. An assessment of the external works was calculated, and indicative rates applied.

This was compared to an adjusted cost using the ‘How to Cost a Hospital’ methodology to validate the costs included. Demolition costs are included only for the Estates buildings. Costs are included to reflect the topography of the site in the location of the new build option. The refurbishment option adopts a similar approach as the site layout will change to reflect a smaller building and disposal of surplus land. Costs for diversion of existing services are included. Demolition costs are included to those buildings adjoining the area retained. The costs reflect that the majority of buildings will not be demolished and require making secure prior to disposal. Phasing costs are included to reflect the scope and extended programme of the works. A benchmark of 18.5% has been included for fees and survey costs. This includes for all principal designers but also the specialist designers such as acoustic and fire engineers, ecology and BREEAM consultants. Specialist advisors for the Health Board including the District Valuer, Vat advisor and audit services are included.

Non-Works Cost

IT Costs: A meeting has been held with the Health Board’s IT lead. The IT budget reflects the SMART hospital aspirations for the future.

Art: An allowance of 1% of the Works Cost has been included for art.

An allowance for other Non-Works costs has been included benchmarked against the Grange Hospital.

Decant accommodation is included for the Estates buildings demolished to allow construction of the new building.

Decant accommodation is not included for the refurbishment option with an allowance included for decant phasing costs.

Security of Existing Hospital: An allowance is included to make secure and provide hoarding around the existing hospital to prevent unauthorised access. This applies to the new build and refurbishment options.

The equipment allowance is included as a percentage to reflect the potential equipment requirements for the building based on benchmark information.

An allowance of 10% has been included as a Contingency. No provision for Optimisation Bias has been included in the capital costs.

Vat has been included at the current prevailing rate of 20%. Vat reclaim has been included for all design fees to the new build option.

Vat reclaim has been included for design fees and asbestos removal for the refurbishment option.

The capital costs have been costed at 4Q 2021 price levels with a forecast PUBSEC Index of 269. Costs have also been presented at the Business Case Reporting Index of 250. It is recognised that future adjustments to these costs will be made against the Business Case Reporting Index of 250.

8.2 Cost summary table

Refurbishment

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£22,908,307	£209,695,262	£71,493,000	£56,306,700	£56,306,700
On-costs	Incl	Incl	£10,172,571	£7,951,523	£7,951,523
Location adjustment	Incl	Incl	£0	£0	£0
Fees	Incl	Incl	£15,108,131	£11,887,771	£11,887,771
Non-works cost	Incl	Incl	£11,616,656	£9,567,582	£9,567,582
Equipment costs	Incl	Incl	£5,719,440	£4,504,536	£4,504,536
Contingency	Incl	Incl	£11,410,980	£9,021,811	£9,021,811
VAT reclaim	Incl	Incl	-£2,568,022	-£2,031,295	-£2,031,295
Project cost	£22,908,307*	£209,695,262	£122,952,756	£97,208,628	£97,208,628

New Build

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£22,908,307	£209,695,262	£91,194,528	£64,555,296	£64,555,296
On-costs	Incl	Incl	£13,127,363	£7,910,794	£7,910,794
Location adjustment	Incl	Incl	£0	£0	£0
Fees	Incl	Incl	£19,299,550	£13,406,227	£13,406,227
Non-works cost	Incl	Incl	£12,561,059	£10,657,541	£10,657,541
Equipment costs	Incl	Incl	£7,295,562	£5,164,424	£5,164,424
Contingency	Incl	Incl	£14,347,806	£10,169,428	£10,169,428
VAT reclaim	Incl	Incl	-£3,216,592	-£2,234,371	-£2,234,371
Project cost	£22,908,307*	£209,695,262	£154,609,276	£109,629,339	£109,629,339

* Cost at March 2021 Price Level

Note:
All figures listed above in black are gross costs inclusive of VAT

Hywel Dda University Health Board

A Healthier Mid & West Wales: Transforming our Hospitals Programme Business Case

Estates Annex: Appendix C Prince Philip General Hospital

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Revision History

Rev	Date	Revision Description	Issued By	Checked By
Rev 0	17.01.2022	Issued for Health Board Review	SW	ND

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4.	Estates Options
5.	Engineering Infrastructure
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7.	Town Planning Considerations
8.	Cost Summary

Prince Philip Hospital

Prince Philip Hospital

1.0 Description of the Hospital

Prince Philip Hospital is located in the village of Dafen, approximately 2km to the north east of Llanelli town centre on the B4303 adjacent to Bryngwyn School. The site occupies approximately 12.48 hectares. The central and eastern areas of the site are relatively flat however the topography rises steeply along the western side with a level difference of over 15m. The site is bounded on all sides by mature trees with low rise residential areas to the west and south, the main access road to the north and a small industrial zone and agricultural land to the East.

The original hospital in Llanelli opened in 1867 was located on Bigyn hill and was little more than three terraced houses connected together. Further north the Llanelli Poor Law Union Workhouse was established on Swansea Road in 1836 and in the late 19th century was expanded to include sick wards. After 1930 the workhouse was re-designated as a 'public assistance institution' and after 1948 it became known as Bryntirion Hospital. It remained within the NHS estate until 2004, although all acute clinical services had been relocated to Prince Philip Hospital in the early 1990's.

Prince Philip Hospital was designed by Holder Mathias and was built in the late 1980's. Similar to Morriston and Royal Glamorgan Hospitals, Prince Philip Hospital was based on a standard 'hospital nucleus' template, a standardised hospital planning approach that sought to achieve reduced cost and greater efficiency. It was built on a green-field site adjacent to the sites of the famous Dafen Brickworks and tinplate works and close to the associated colliery at Bryngwyn.

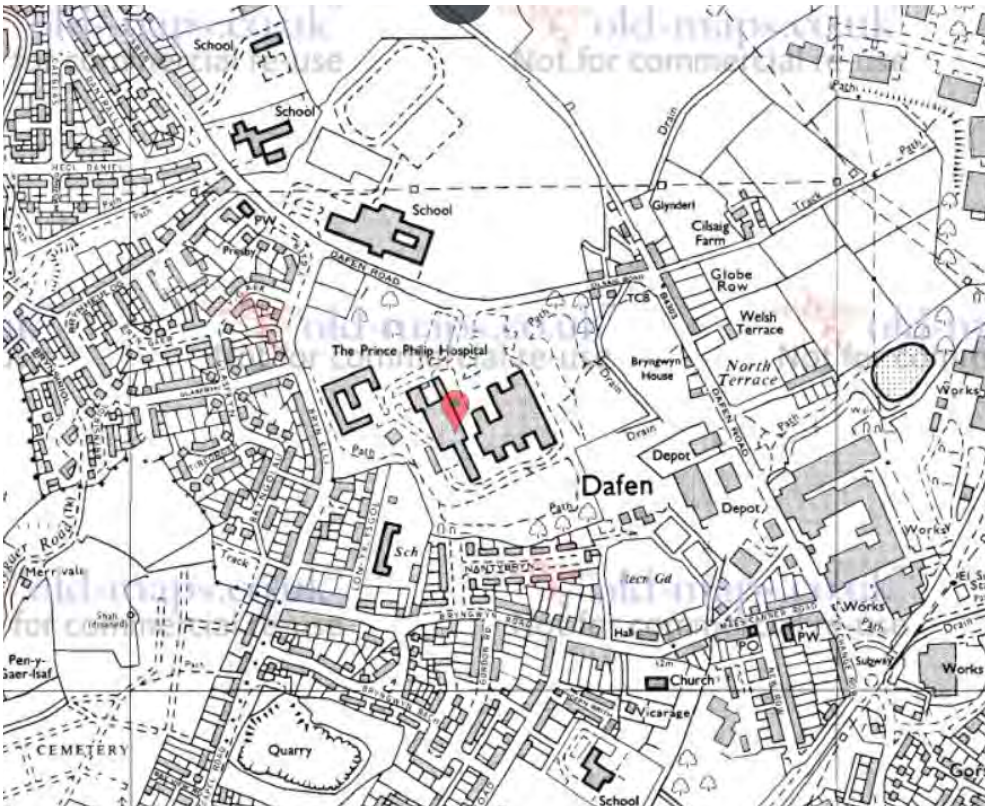
When it first opened in 1990 it included 200 beds an accident and emergency department, diagnostic and therapeutic facilities, staff residences and extensive pharmacy labs. The latest data shows that the current hospital has a gross internal area of 29,297sqm and key clinical functions include 216 inpatient beds and 42 mental health beds, a minor injuries unit, surgical day case, endoscopy and palliative care which includes a hospice facility; the hospital also provides for a range of specialist outpatient clinics such as Haematology, Respiratory and Gastroenterology. In 2010 a new breast care unit was opened at the hospital followed by a rehabilitation unit in 2013 and a reconfigured minor injuries unit in 2016.

Generally the buildings are in a good state of repair although with the buildings now 30 years old, some repairs and replacement is now required such as isolated areas of roofing and rainwater goods, and the replacement of the original powder coated aluminium windows mostly single glazed with new double glazed units. Internal fabric of the hospital is generally in good condition though some areas of finishes are nearing the end of their use and should benefit from some cosmetic redecoration. Structurally some further investigations may be required to establish whether the frame would meet current standards for healthcare design particularly the vibration characteristics.

Despite the relatively young age of the hospital there are a number of statutory compliance issues which need to be addressed including those relating to electrical systems safety, control of legionella and general Health & Safety at Work issues. The fire escape strategy is considered to be acceptable due to the building being based on the nucleus design which allows for progressive horizontal evacuation.



Prince Philip 1992 (Holder Mathias)



Prince Philip Hospital Site Layout 1992

Prince Philip Hospital

C

The internal spaces and layout are reflective of the timing of the design and construction and although relatively modern when compared to the rest of the acute estate many of the clinical departments require upgrades to support the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity, increases infection risk and makes safe manual handling more difficult to achieve. Many of the patient beds are arranged in 6 bed bays which are no longer recommended and the proportion of single rooms (14%), falls well below current recommended standards. Very few bedrooms are equipped with en-suite facilities.

Staff facilities are also known to be below standard with reports of insufficient support spaces such as staff rooms, toilets, changing facilities and office accommodation.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update the nurse infrastructure. A number of major plant items were also identified as being 'end of life' including LTHW boilers, steam boilers, control panels, main water storage tanks and a number of AHUs.



Aerial view of Prince Philip Hospital (Google Maps)



Prince Philip Hospital Main Entrance

2.1 Site: Massing

Prince Philip Hospital is located approximately 2km to the north east of Llanelli town centre occupying approximately 12.45 hectares adjacent to the B4303. The central and eastern areas of the site are relatively flat however the topography rises steeply along the western side with a level difference of over 15m.

The site is bounded on all sides by mature trees with low rise residential areas to the west and south, the main access road to the north and a small industrial zone and agricultural land to the East.

The site only has one access point from the B4303 to the north making it vulnerable to failure. The access point connects to a ring road which runs around the hospital building giving access to staff and visitor parking to the north east, FM and estates areas to the south, residential accommodation to the west and the new Bryngwyn Hospice to the north west of the site.

The main entrance and minor injuries unit face the site entrance to the north with the rehab unit entrance further to the East. Entrance to the Acute Medical Assessment Unit is at the south of the hospital with separate entrances on the west to the FM stores and boiler house.

Buildings on the site are all under 30 years old and are generally in good condition. The main hospital buildings are all two storey pitched roof construction with plant in the roof space and some areas of increased height along the central hospital spine. The residential blocks to the west are generally 3 storeys but overlook the main building as a result of being located on a raised bank. The main building is constructed with brickwork facades and a pitched concrete tile roof and with powder coated metal detailing.

Ancillary buildings are generally of similar construction to the main building although only one or two storeys, apart from the Bryngofal mental health unit which is single storey brickwork and insulated metal cladding and a curved metal roof construction.



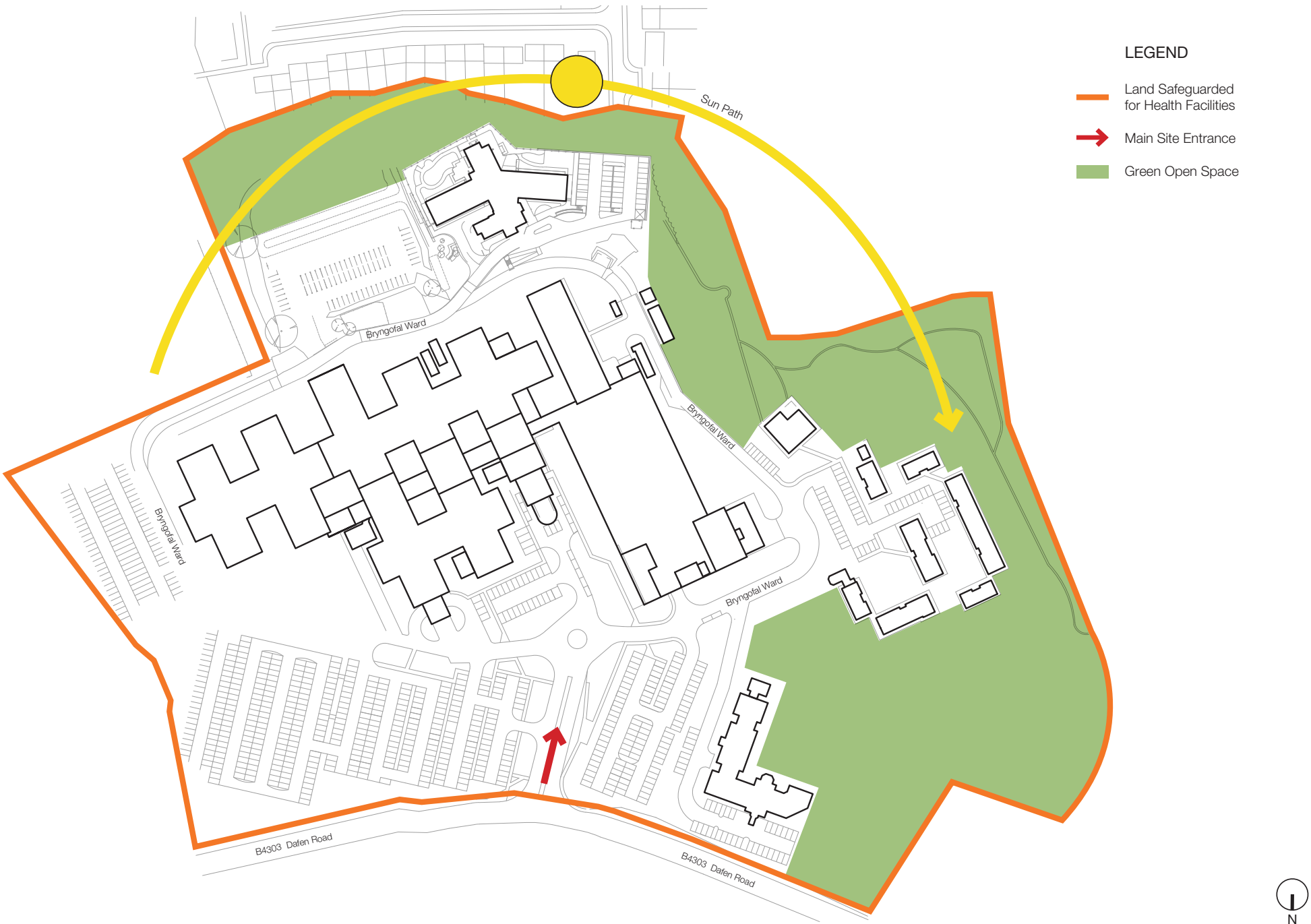
Site Plan - Figure Ground

2.2 Site: Urban Context and Planning

Prince Philip Hospital is located approximately 2km to the north of Llanelli town centre in the village of Bryngwyn.

The central and eastern areas of the site are relatively flat however the topography rises steeply along the western side with a level difference of over 15m. The site is bounded on all sides by mature trees with low rise residential areas to the west and south, the main access road to the north and a small industrial zone and agricultural land to the East.

The current Local Development Plan expires in 2033. The hospital sits within the Llanelli Principal Town Centre development zone. There are no specific development proposals adjacent to the site. There are currently no listed buildings or tree preservation orders on the site.



Site Plan - Planning

2.3 Site: Clinical Zoning

Clinical services currently provided at Prince Philip Hospital include;

- Minor Injuries Unit
- Acute Medical Assessment Unit (AMAU)
- Diagnostic Imaging (X-ray, MRI)
- Planned care
- Ambulatory care
- Stroke Unit
- Breast Care
- Surgery
- Hospice

The hospital also includes inpatient wards with 258 inpatient beds covering the following specialities;

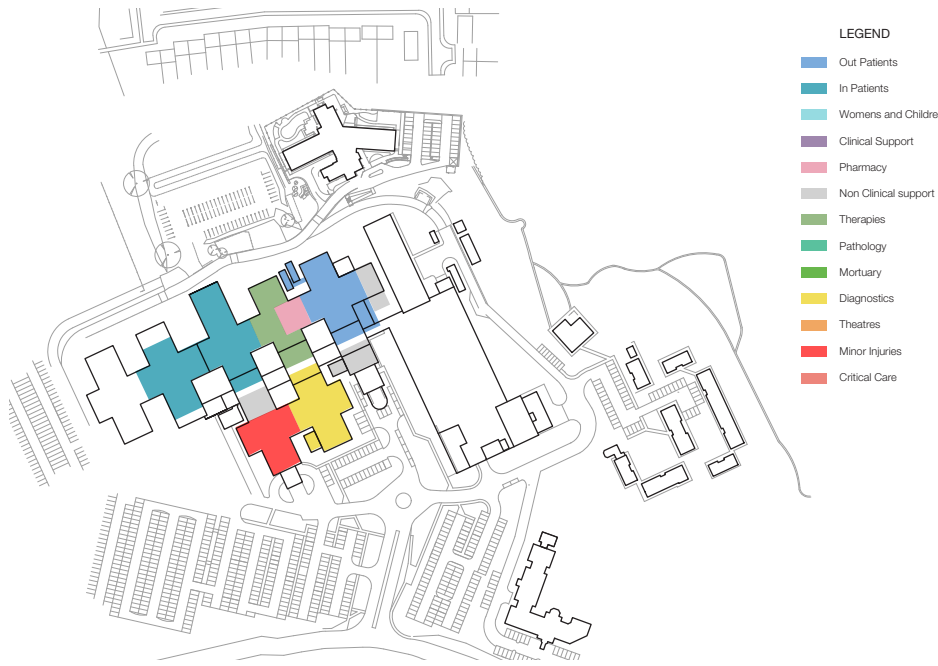
- General Medicine
- Trauma & Orthopaedics
- Rehabilitation
- General Surgery
- Stroke

The latest Data Report confirms the overall gross internal floor area as 29,297sqm

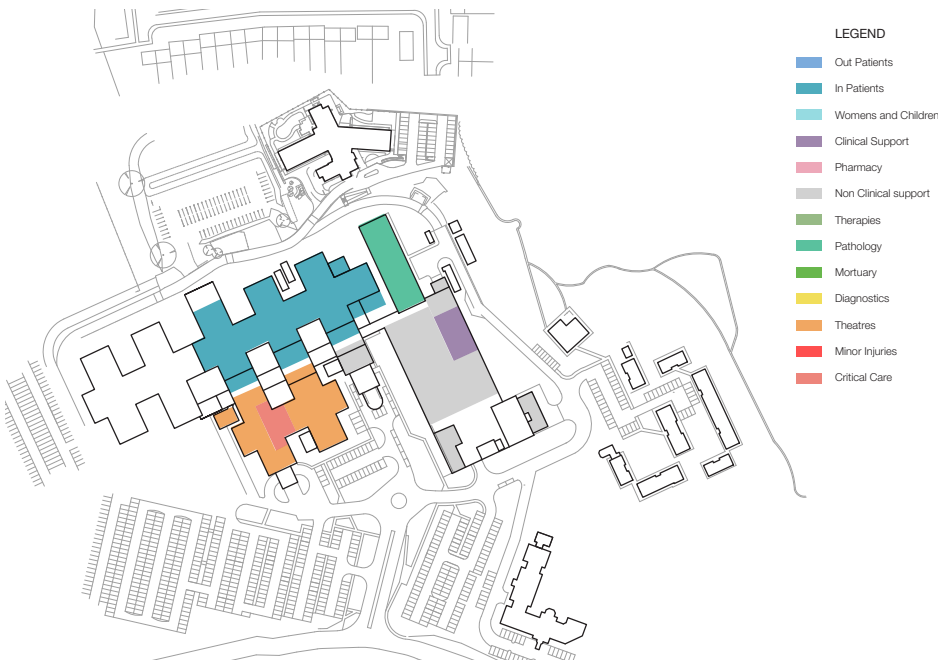
Clinical adjacencies are highlighted in the adjacent floor plan diagram and on the following pages.



Site plan - Lower ground floor



Site plan - Ground floor



Site plan - First floor



Site plan - Second floor

2.4 Access & Movement: Site Access & Parking

Vehicular access to the site is via a single junction to the B4043 to the north of the hospital. Within the site a ring road runs around the main building which is part two-way and part one-way.

Visitor and staff parking is spread across the site with the main public car park located adjacent to the site entrance. All parking is on-grade
The current Data Report suggests that there is a total of 705 parking spaces available on the site, of which 28 spaces are designated disabled parking spaces and 455 are dedicated for staff.



Site Plan - Car Parking

2.5 Access & Movement: Emergency & Service Access and Public Transport

The Minor Injuries Unit at Prince Philip is located adjacent to the main entrance at the North of the main hospital block. The ‘blue light’ access route to the ground floor Minor Injuries Unit follows the same route as all other site traffic. There is a dedicated ambulance drop-off and parking zone outside the MIU entrance.

Facilities Management and deliveries access to the Hospital is via the hospital ring road the main estates building located to the west of the site and connected to the main hospital. A designated goods delivery area and turning head are provided within this zone area to prevent disruption of the one-way flow traffic.

There is a public bus stop at the northern end of the site adjacent to the B4303. Currently there is no cycle route or hub on the site.



Site Plan - Public Transport and External Circulation

2.6 Access & Movement: Internal

There are various access points around the perimeter of Prince Philip Hospital which enable access into each block or specific department. The main entrance concourse however is accessed from the North facing the main vehicular site entrance and bus stop.

Entrance via the concourse will lead you to the hospital street from which Individual corridors and vertical circulation cores lead into the individual departments across the various site levels.



Site Plan - Internal movement

2.7 Estate Condition

Hywel Dda University Health Board owns and leases building which range from 19th Century to modern day with varying degrees of functionality, condition and performance. 40% of the estate is over 50 however at Prince Phillip Hospital, all of the estate has been built within the last 35 years.

Despite the relatively modern construction many of the internal areas do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience.

The total backlog maintenance value across the four acute sites was £62.9m in March 2021 of which circa £40 million is categorised as Significant Risk. At Prince Philip Hospital the total backlog maintenance cost at March 2021 is £6.3m with £4.4m categorised as significant risk. It is important to note that in developing areas to meet current guidance capacity may need to be reduced.

Prince Philip Hospital was built using a Nucleus hospital template design, with courtyards, linked by a long central 'Hospital Street' which allows the hospital to be easily extended. The Service Centre has a deeper plan form and has a mansard appearance with large central flat roof. There are a number of 3-storey residential blocks to the west of the main hospital, some of which have since been converted into office accommodation.

The main hospital was extended in the early 2000's to create a new Elderly Mental Infirm unit and around the same time a new Adult Mental Health Services Unit was built on land to the south of the main hospital. A new Breast Care Unit was also developed in the early 2000's. All of the buildings on site are generally in good condition as can be seen on the adjacent diagram.

Investment is required in some areas to remove significant infrastructure risks such as the following key risks identified on the latest backlog maintenance schedule (March 2021);

- Fire compartmentation upgrades and fire door replacement
- Replacement of roof coverings and rainwater goods
- Water storage tanks require replacement
- Replacement of steam boiler 2
- Replacement of air handling units
- Replacement of gas isolation valves



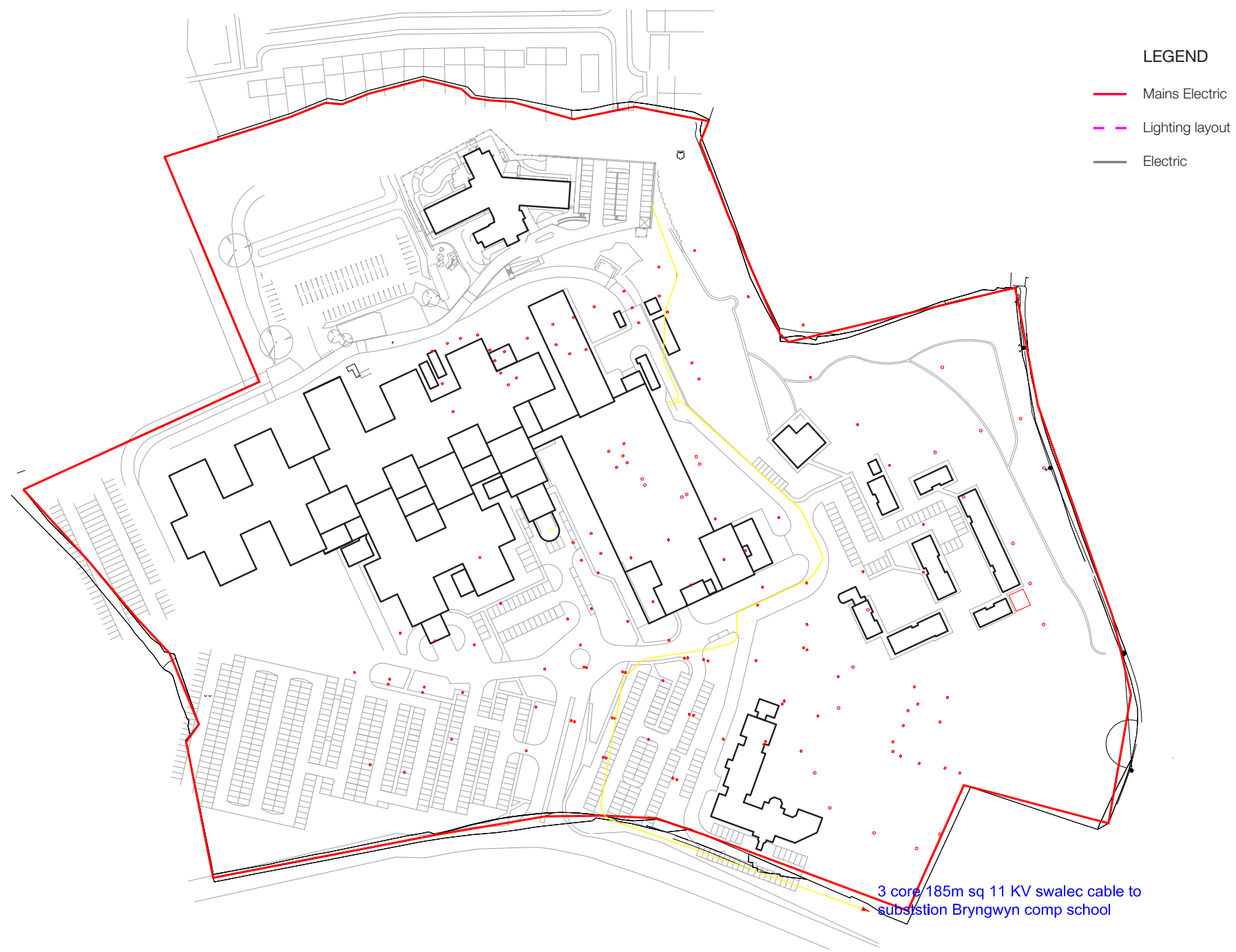
Site Plan - Estate Condition

2.8 Services Infrastructure: Electrical

The Minor Injuries Unit at Prince Philip is located adjacent to the main entrance at the North of the main hospital block. The ‘blue light’ access route to the ground floor Minor Injuries Unit follows the same route as all other site traffic. There is a dedicated ambulance drop-off and parking zone outside the MIU entrance.

Facilities Management and deliveries access to the Hospital is via the hospital ring road the main estates building located to the west of the site and connected to the main hospital. A designated goods delivery area and turning head are provided within this zone area to prevent disruption of the one-way flow traffic.

There is a public bus stop at the northern end of the site adjacent to the B4303. Currently there is no cycle route or hub on the site.



Site Plan - Electrical Infrastructure

2.9 Services Infrastructure: Mechanical

General

Much of the infrastructure dates from the original build. Some of the distribution has been replaced over the life of the hospital but the majority of these replacements have been local, linked to specific issues and primary routes. Despite maintenance and repair, much of services infrastructure has now reached the end of its service life.

Heating Systems

With the exception of Bryngofal and Ty Bryngwyn, heating is provided via two natural gas fired steam boilers (circa 2005 and 2015) and a natural gas fired LTHW boiler (circa 1991) located in the central boiler house. LTHW is created primarily by the CHP unit. Two of the boilers include dual fuel burners to provide resilience.

LTHW and DHW are distributed for perimeter heating (a variable temperature loop). Radiators are located on external walls only. Local control is poor and zoning non-existent. Heating in the newer template blocks is provided by under floor radiant panels.

Bryngofal and Ty Bryngwyn are served by two natural gas boilers each.

The residential buildings are heated using a range of domestic sized boilers (total of 26) and gas fired water heaters (x3), the majority being in poor condition.

The majority of pipework and emitters date to the original installation, however they have been maintained and repaired as required.



Site Plan - Mechanical Infrastructure

Ventilation Systems

General ward areas are naturally ventilated. Ventilation is provided via 17 AHU's to a number of departments including theatres, endoscopy and pathology. Air is extracted from the spaces served by the air handlers by a series of extract fans located in plant rooms or ceiling voids. The majority of units are located in rooftop plant rooms, all provide 100% outside air however most have no heat recovery.

The majority of AHUs are a dual duct design (air is heated, and then cooled), typical of the building age, and are notoriously energy inefficient. Measures taken to improve efficiency include replacing original with high efficiency fan motors using variable speed drivers has been undertaken. Many mixing boxes on these systems have now failed.

Cooling

7 large chilled water plant provide cooling to circa 15 AHU's. These are approx. 10 years old and in good condition
Two AHUs use local DX cooling units. Comfort cooling is provided by only 2 small split units.

Steam

Steam generated in the boiler house is used for LTHW, DHW and process use on site e.g. HSDU sterilisation and kitchen equipment. A plate heat exchanger located in the roof top plant room utilises steam for the air handler batteries.

Water

Domestic water is provided via 1 main 50mm supply, held in a large storage tank above the energy centre to ensure a constant water pressure. The Residences and Bryngofal have their own 40mm and 25mm supply respectively. Additionally, a 100mm hydrant main is located on site. Flow restrictors and cistern dams were installed in taps and WCs in 2008.

Hot water is generated in the energy centre via LTHW plate heat exchangers linked to a buffer vessel and distributed to the site. The Breastcare department has a dedicated local system consisting of plates and buffer vessel.

Extensive replacement of the domestic water system would be required to bring it up to current WHTM requirements for temperature monitoring and legionella control.

Foul Drainage

Above ground vertical stacks and horizontal runs date from the original installation, local repairs and modifications have been carried out to suit specific issues and blockages.

Medical Gasses

Medical gasses have been well maintained but will require local upgrade to meet current WHTM standards regarding resilience of supply. The main service spine corridor pipework was replaced in 2008.

2.10 Civil & Structural Engineering: Below Ground Drainage

The drainage system within the site consists of separate foul and surface water systems.

Surface Water Drainage

The surface water discharges via a network of gravity sewers to the combined sewerage system to the west and south of the site. There are several localised issues associated with the condition of the surface water sewers within the site.

Foul Drainage

The site is served in the main by a network of gravity sewers that convey the foul water generated by the hospital into public sewerage system that runs through the easternmost portion of the site.

Dwr Cymru Welsh Water Asset Plans show that there is a combined sewer network area which serves the site. There are several sewers that gravitate southwards generally through the main car park and around the eastern side of the hospital building.

The records that are available for the site show that the original $\varnothing 600\text{mm}$ foul water drainage sewer indicated beneath the eastern end of the existing building had been diverted and abandoned. It appears from the records that all the foul and surface water flows from the building extension discharge into this network.



Site Plan - Drainage Infrastructure

2.11 Civil & Structural Engineering: Topography & Geology

There is a gradual rise in elevation from around 15mAOD in the east of the site to around 40mAOD along the western boundary. The main building and car park are however set at around 20mAOD.



Site Plan - Topography

2.12 Civil & Structural Engineering: Flood Risk

Rivers & Tidal – The Natural Resources Wales plan shows the majority of the site to be within flood zone 1 which indicates that the risk of flooding from rivers or tidal waters risk is low. The stream that runs to the east of the site poses a flood risk to the adjacent car park, however it can be seen that this only affects a small area. The elevation of the site means that it is not at risk of tidal flooding.

Surface Water – There are several areas that are highlighted on the Natural Resources Wales mapping as having a high risk of surface water flooding around the perimeter of the main hospital building. This is indicative of the low lying external areas immediately adjacent to the building.

Dam – The dam data suggests that there is a high risk of flooding in similar areas to flooding from rivers which is dealt with accordingly through landscaped areas and a lack of defence infrastructure, as previously mentioned.



Site Plan - Flood Risk Assessment Map

2.13 Existing Structures

External condition

Prince Philip Hospital was built in the 1980's on the site of the former Bryn-Gwyn pit. The hospital is an example of the Nucleus hospital design developed in the 1970's, and features low-rise cruciform blocks, with courtyards, linked by a long central corridor which allows the hospital to be easily extended. The building has a steel frame and in-situ concrete floors, facing brick works cavity external walls with flat metal cladding panels between first floor windows, and a concrete tiled pitched roof. Windows are generally aluminium framed with single glazing. The Service Centre has a deeper plan form and has a mansard appearance with large central flat roof. There are several three storey residential blocks to the west of the main hospital buildings. Some of these have since been converted into office accommodation.

The main hospital was extended to the east in the early 2000's to create a new Elderly Mental Infirm (EMI) Unit, and a new Adult Mental Health Services Unit was built on land to the south of the main hospital soon afterwards. The new EMI Unit is of similar construction and appearance to the main hospital, but has a profiled metal sheet roof. The Adult Mental Health Services Unit has a steel frame, facing brick work cavity walls at ground floor level with composite insulated metal panel cladding above, and a curved profiled metal sheet roof. A new Breast Care Unit was also developed in the early 2000's at the rear of the main entrance block, and is of similar construction to the main hospital with the exception of two small extensions which have composite insulated metal panel cladding and flat roofs.

Overall the building fabric and internal decoration and finishes are operationally sound, with minor repairs required. Elements of the building, such as flat roofs are reaching the end of their serviceable life however. Significant concerns are listed below:

- The flat roof over the service centre at end of its functional life and in need of replacement.
- The coating on the metal cladding panels is starting to deteriorate leading to corrosion of the panels. These require major repair or replacement.
- A number of smaller modular buildings are nearing the end of their functional life and will require major repair or replacement in the near future.
- The smaller scale traditionally built residential blocks are all in fair condition, and require minor repairs.

Internal condition

Original partition walls are of lightweight construction with plasterboard linings fixed to a metal framework, and veneered internal doors.

The internal fabric and finishes are generally in fair condition but showing signs of fatigue, with localised areas of impact damage. Many internal areas, including the wards, haven't been refurbished since the 1980's and are in need of updating. Fixtures and fittings are generally in good condition.

The main areas of concern are as follows:

- Wards need to be refurbished.
- Some internal doors have significant wear and tear, and are in need of replacement.
- Internal primary rainwater and foul drainage pipe work is operationally unsound, with leaking joints and internal corrosion that causes frequent blockages. Both require major repair or replacement.

External works

Access roads and car parks have macadam surfaces, and are generally in fair condition, with localised repairs required. The main entrance forecourt has concrete clock paving and is in fair condition. Footpaths have either macadam, precast concrete flag paving surfaces. The principal access routes are in fair condition, with level and even surfaces.

2.14 Site: Fire Assessment

Prince Philip Hospital was designed and constructed in the 1980s and opened in 1990. The design is based on the Nucleus concept first established in 1975 and the design meets the standards of the time. Though there are many main areas in the nucleus fire precaution strategy which differ from current standards the core objective is to provide life safety by providing control and containment of a fire and the safe evacuation of patients and other personnel.

However much of the existing hospital does not comply with current WHTM 05-02 fire safety guidance for example staircases are not sized to support mattress evacuation and there are a number of staircases are accessed direct from patient accommodation. The configuration of the wards does not support progressive horizontal evacuation with insufficient space in adjacent wards for patients from other wards.

The current backlog maintenance plan identifies a number of significant risk items which need to be addressed including remedial works to compartment and sub-compartment construction, replacement of fire dampers and fire rated doorsets and improvements to escape routes.

The backlog maintenance plan also identifies remedial works required to the existing fire detection system and fire signage to bring them both upto current legislation standards and will therefore require a phased upgrade.

The extent and efficacy of fire protection to the structure is unknown will require further detailed investigation during the Outline Business Case Stage.

2.15 Opportunities and Observations

The Current (2020) Health Board Annual Report identifies a number of key projects at the Prince Philip site to address specific clinical needs including;

- Pathology Services Upgrade
- Post Graduate Alteration Works
- X-Ray Replacement
- Improvements to Endoscopy Services to achieve JAG accreditation
- HSDU Refurbishment

Although the building fabric at Prince Philip is generally in good condition there is an opportunity to assess the energy performance of the existing buildings and consider opportunities to incorporate low carbon technologies to support a move towards net zero carbon. This may include new engineering services plant and infrastructure as well as upgrades to the building fabric.

The main hospital building is arranged as a nucleus and therefore there is the opportunity to expand services in 1,000sqm increments following the line of the hospital street. With the FM and estates are located to the west of the street the opportunities for expansion would be to the east.

There are also a number of potential development sites around the perimeter of the existing ring road although any new buildings will need to consider the displacement of car parking on the site. The site has a reasonable amount of landscape amenity although there may be an opportunity to introduce a walking route in the landscape for staff, patients and visitors which would enhance the character of the site, improving wellbeing and staff retention.

A separate Programme Business Case has been developed to look at the completion of critical backlog maintenance on all of the Health Board sites with a view to maintaining business continuity during the development and delivery of this Programme Business Case. This detail will help to inform the development of the Building Engineering Services strategy moving forward. It may be that some maintenance activities are deferred in favour of new developments.



Site Plan - Opportunities

3.1 Summary of High Level Brief

The Health Board ten-year health and care strategic vision (“A Healthier Mid & West Wales: Our Future Generations Living Well”) sets out the strategy for whole system change following the outcome of its previous public consultation exercise in November 2018.

The strategy describes the commitment to work in an integrated way across health and social care at a local and regional level, placing significant emphasis on the people and communities which access services provided by the Health Board.

During the initial consultation phase the Health Board identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported;

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision and health outcomes across the three counties, for example there is a 10-year gap in healthy life expectancy across the area.

The consultation phase culminated with the Health Board describing a future model of care based around a network of integrated health & wellbeing centres and community hospitals which will bring key services and staff together in one place and provide virtual links between the local population and specialist services at the acute hospital sites.

The estate strategy which supports this model of care, known as ‘Proposal B’ considers the future transformation of the acute hospital estate and the associated implications on the community infrastructure. It includes provision of a new urgent and planned care

hospital in the south of the region which will centralise all specialist children and adult services. The hospital sites at Withybush and Glangwili will be repurposed as community facilities with beds. Prince Philip and Bronglais hospitals in Llanelli and Aberystwyth will remain as general hospitals with refurbishment works as necessary to support the overall changes to the service model.

The proposed changes create significant opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce.

The findings from the phase 1 consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.

Through the development of the briefing information the Health Board have identified a range of service transformation scenarios which are primarily driven by assumptions on future bed numbers. These are described as follows;

‘Do nothing scenario’ where the current service is retained with no major reconfiguration or transformation.

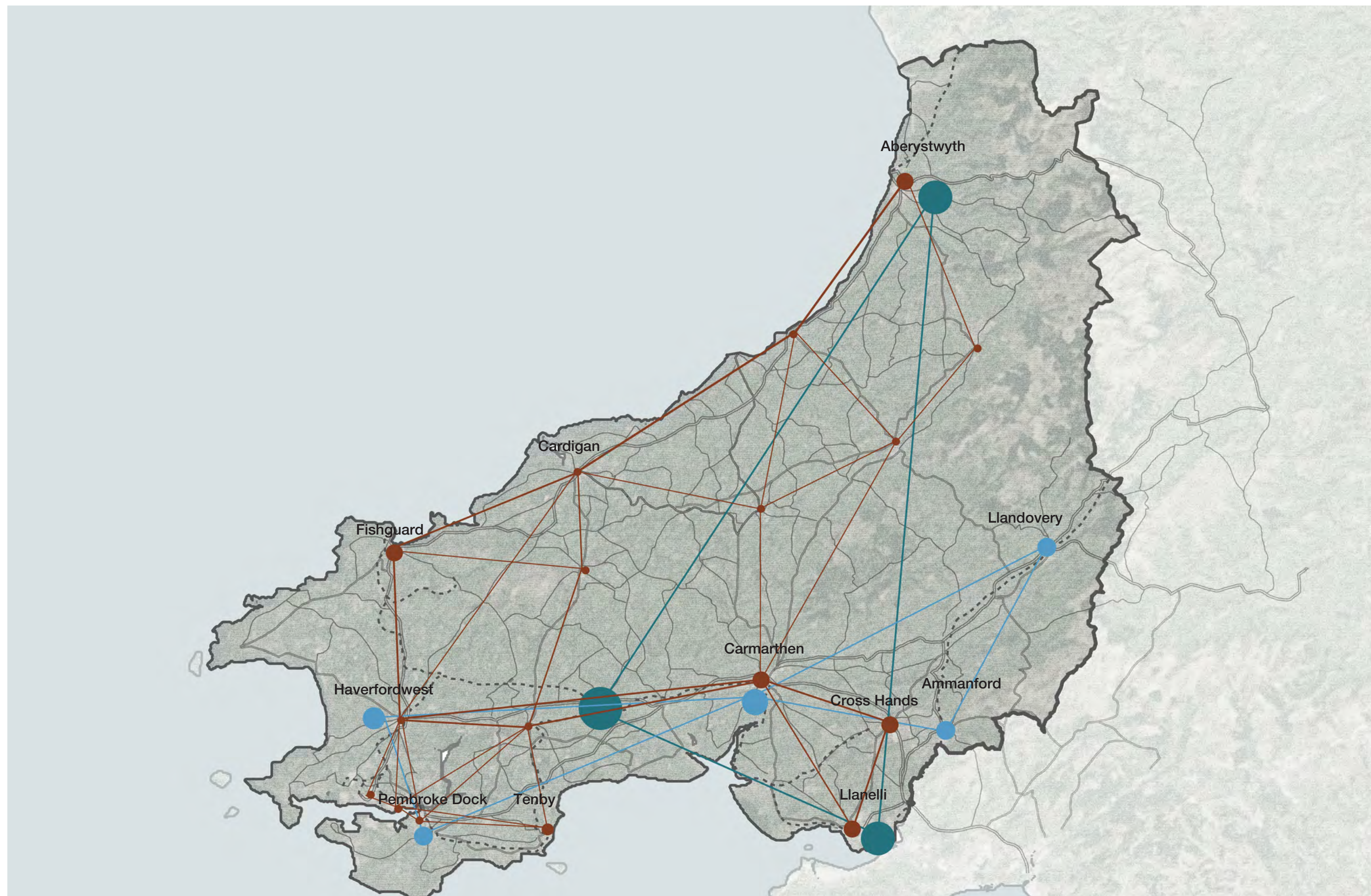
‘Do minimum scenario’ where the current service is retained with minor transformation of services to align with the AHMWW strategy and with focussed investment in new community projects and to bring the acute hospital estate up to Condition B.

‘Minimum efficiency scenario’ where Services are transformed to align with the AHMWW strategy based on pessimistic design assumptions. This scenario assumes a higher number of retained beds with increased retention of beds on the community sites and minimum numbers transferred to the new Urgent & Planned Care Hospital. This scenario also assumes the retention of day surgery at both Glangwili and Withybush.

‘Likely efficiency scenario’ where services are transformed to align with the AHMWW strategy based on a “most likely” set of design assumptions to determine a reduction in bed requirements generally

with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites. ‘Maximum efficiency scenario’ where Services are transformed to align with the AHMWW strategy with more ambitious design assumptions applied. The scenario minimises the requirement for beds at the Urgent & Planned Care Hospital and on the associated community sites.

The impact of the various efficiency scenarios on the Bronglais site is considered in more detail on the following pages.



Proposal B: Network of proposed acute and community sites

4.1 Summary of Estate Development Options

The Prince Philip General Hospital site will operate as a local general hospital, supporting acute medical admissions. The hospital will require consultant-led overnight beds with diagnostic support and will act as a stabilisation and transfer hub for certain specialised conditions. There will be a greater medical presence on this site compared to Glangwili and Withybush Hospitals. There is also an ambition to build on existing local services that can thrive as centres of excellence (e.g. breast surgery).

A summary of the key functional content as described in the high level service brief is as follows:-

- 24/7 GP led urgent care centre;
- 24/7 access to acute medicine supported by consultants and teams plus high dependency care capability;
- 24/7 diagnostic support;
- Critical Care (level 1, 2 and 3)
- Low risk day case surgery and endoscopy;
- Outpatient clinics and specialist ambulatory 'hot' clinics plus Chemotherapy;
- Facilities to offer midwife-led deliveries.

The service narratives and schedules of accommodation which have been developed to support the programme business case describe the proposed operational and spatial requirements in further detail.

Some key elements of the brief are as follows:-

- Providing facilities which support the Health Boards vision to be safe, accessible, sustainable and kind
- Achieving design standards set out in Welsh Health Building Notes and Welsh Health Technical Memoranda.
- Protecting patient privacy and dignity
- Supporting efficient flows
- Providing appropriate and logically placed support facilities for staff and patients (zonal hubs)
- Ensuring facilities are both accessible and inclusive
- Maximising the potential for flexibility and future adaptation.

Although the above summary describes the key functional content proposed for the Prince Philip site in the future, the Minimum, Likely and Maximum service transformation scenarios describe slight differences in the level of service provision.

For Prince Philip hospital the level of key services proposed such as minor injury services, outpatient services, ICU / HDU, Inpatient therapies & other clinical support services are all envisaged the same; similar to Bronglais hospital the main differences amongst the three scenarios are driven by the different number of inpatient beds which also results to varied level of day case surgeries, endoscopy as well as staff / visitor welfare and FM services.

In the minimum service transformation scenario, alone with 24 admissions beds and five critical care beds which remain consistent in all scenarios, a retention of 176 inpatient beds or 8 number of inpatient wards on the site has been proposed; however in the likely and maximum scenario, a reduced number of 140 beds / 6 wards and 100 beds / 5 wards are assumed respectively.

For each of the service transformation scenarios at the Prince Philip site the Programme Business Case considers only the refurbishment options of the existing estate. The external facades of the hospital buildings are in good conditions hence replacement of the facades is not considered in the business case. As advised by the hospital manager that there is no spare capacity within the existing estate which can provide decant opportunities to enable the area by area refurbishment within the existing building envelop whilst maintaining the clinical services throughout the programme. This has prompted the proposal to allow suitable amount of new build spaces to ensure the programme can be delivered without having to stop any of the clinical services.

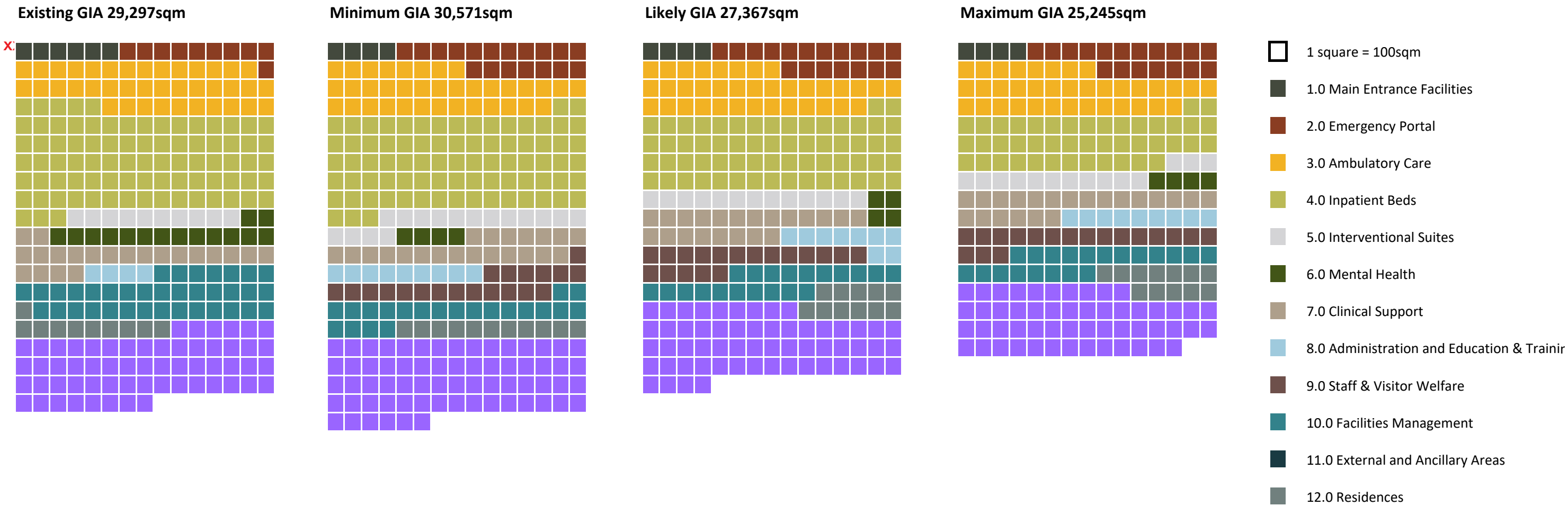
Currently on site the admission service is located across the main street from the minor Injury unit, and it only provides a total of 14 number of assessment beds, not only the bed number is insufficient compared with the SoA, the bed space quality is also below standard with a mixture of single, 2 bedded, 3 bedded and six bedded rooms. So a new admission ward block of 24 beds adjacent to the existing minor injury unit would be a sensible solution to start unlocking the spaces.

The original scope of proposed refurbishment strategy does not include reconfiguration of walls and layouts; however most inpatient bed space and layout do not comply with HBN recommended standard with many having no ensuite facilities;

Each of the existing ward footprint generally falls well short from the HBN standard, i.e. space within one nucleus template would just be enough to provide one 24 bedded ward unit with 50% single beds, but it currently has more than double the amount of beds; take block 8 as an example where both ward 3 and ward 4 locate, each ward has 26 beds which makes a total of 52 beds within one nucleus template, some of which are six bedded which HBN standard does not recognise. Therefore in order to help improve compliance of the hospital and quality of the patient spaces especially in a few years time after the estate refurbishment programme completes, providing some new ward spaces in some options has become valuable.

The estate options for the three scenarios propose different level of refurbishment and different amount of new build spaces therefore will have different implications in terms of cost, implementation programmes, though all options will have potential to be 100% compliant with HBN in terms of bed & ensuite layout & spaces.

The range of estate solutions are described in greater detail on the following pages.



1. Area taken from SHP Schedule of Areas V2.2
2. Existing areas taken from 2021 EFPMS data
3. Comparison of existing floor area to proposed functional zones is approximate

4.2.1 Minimum Scenario

The total briefed area in the minimum scenario is 30,571sqm including allowances of 12% and 17.5% for communication space and plant space respectively.

Common in all scenarios, a new admission block adjacent to the Minor Injury unit is proposed to provide 24 admission beds on ground floor and new ICU / HDU department on the first floor. This improves the adjacency between the admission unit and MIU, and provides the opportunity to have HBN complaint ICU beds. Though majority of the outpatient services will stay where they are, Pharmacy is to be relocated from being in the middle of the outpatient are to being closer to the main entrance area, so a small percentage of the area will go through major re-configuration. Location of other key services such as imaging, day case theatres and endoscopy will remain as current though some level of refurbishment will take place to improve the quality of the spaces.

There are eight 24 bedded inpatient ward units assumed in the minimum scenario, providing 176 beds for the hospital. Though the overall inpatient bed numbers are slightly reduced from the current provision, the requirement on the bed space in terms of compliance is much greater.

In this option new extension of one floor above both block 27 & block 26 have been proposed providing 44 HBN compliant beds and ensuites. With Mental health clinic relocating close to the main outpatients, Re-configurations are proposed to lower ground of block 26 & 27, each accommodating a 24 beds ward unit. A further 84 HBN compliant bed spaces can be created through re configuration of ground floor of block 26 and first floor of block 8, 9 and 10.

The overall inpatient bed number in the minimum scenario would be 205 which is in line with SHP's assumption; they include:-

- 176 generic inpatient beds
- 24 admission beds
- 5 CCU beds

Though all of these inpatient beds and ensuites would potentially be HBN complaint in terms of space standard; some derogations against HBN would need to be agreed, due to the possibility that a small number of existing structural columns could potentially encroach into the recommended ergonomic zones in the bedroom or ensuites.

Details on location and numbers of the generic inpatient beds in the minimum efficiency option are:-

Level -1 block 26 & 27 – 48 beds (2 x 24 beds unit)

- Level 00 block 27 (new) & block 26 – 44 beds (1 x 24 & 1 x 20 beds unit)
- Level 01 block 26 (new) - 20 beds (1 x 20 beds unit)
- Level 01 block 8, 9 & 10) – 84 beds (3 x 24 & 1 x 12 bed unit)
- Level 01 (adjacent to MIU) – new admission unit 24 beds
- Level 02 (new above admission unit) – 5 x ICU/HDU beds

HBN compliances of the inpatient beds in this scenario would be 100% with some derogations.

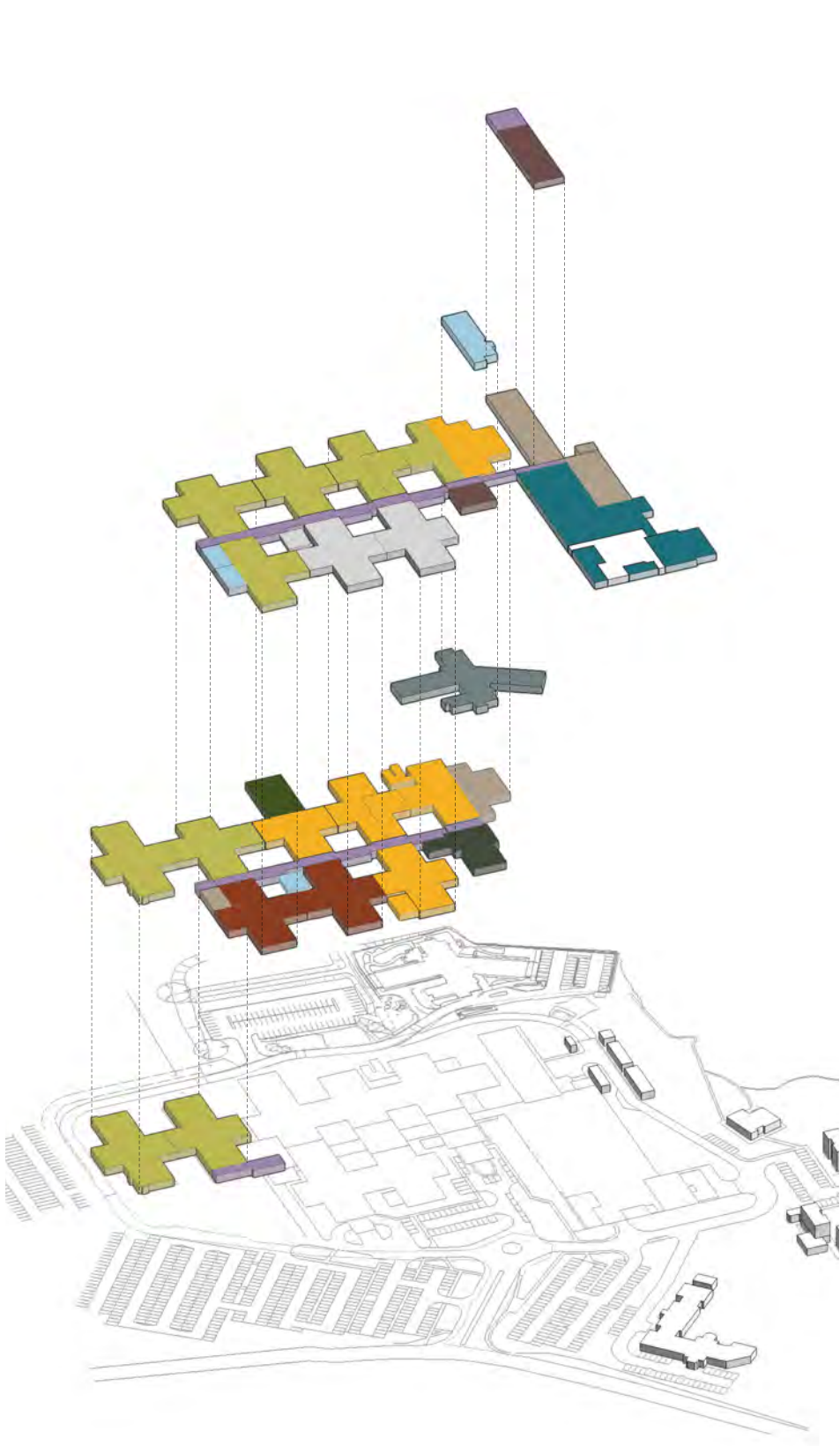
Different level of refurbishment are proposed to most part of the hospital with exception of block 18 & 14 which no refurbishment works is proposed to due to the building condition and unchanged clinical functions. As mental health beds are no longer to be provided on Prince Philip hospital site, releasing spaces especially ground floor of the mental health block 28 which has sufficient spaces to accommodate all residences on one single floor. The vacated residence blocks are still to be kept but use of these buildings will be determined by the Trust project team in the future. These 'no work proposed' and 'future use to be determined' spaces are consistent in all three scenarios.

The major differences in terms of level of refurbishment works directly reflects the main differences in the functional brief, namely the inpatient ward numbers. In the minimum scenario, there would be a circa. 5700m2 of new build; this includes the new 2 storey admission block proposed in all three scenarios, and two new 24 beds units providing two of the eight wards required in the SoA. Major refurbishment work are proposed to those where there is a change of clinical function or large scale of re configuration of layout is needed, for example 6 other wards on lower ground floor, ground floor and first floor. Moderate and light touch are proposed to those which only require a small area of layout change or a uplift on the finishes.

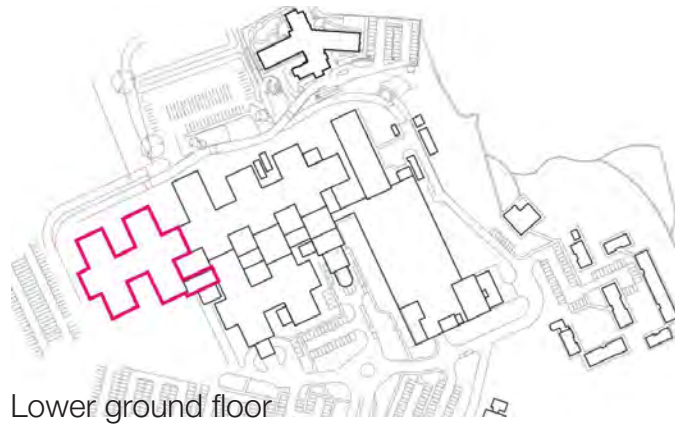
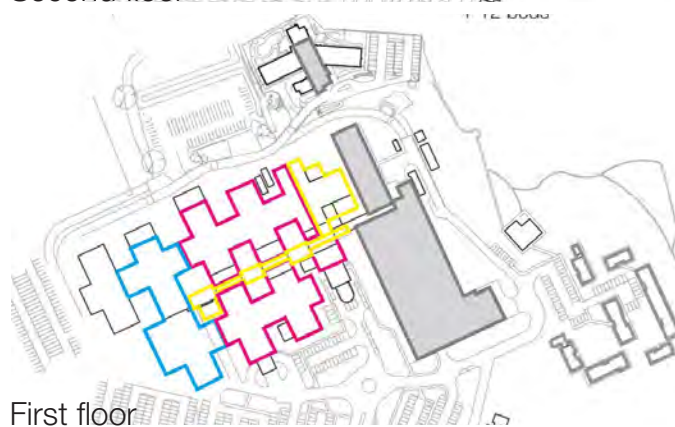
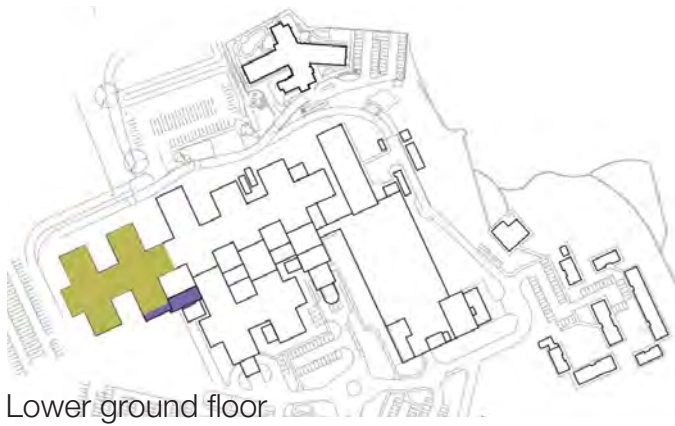
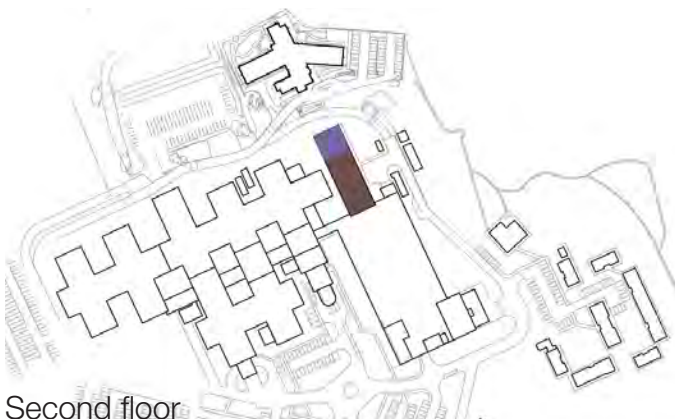
The proposed total area for Prince Philip Hospital in the minimum scenario will be circa. 33,750sqm. Approximate area summary of each type of proposed works in the scenario is summarised as below whilst diagrams of proposed work are illustrated level by level on the next page.

- New build: 5,700m2
- Major refurbishment: 11,750m2
- Moderate refurbishment: 3,150m2
- Light touch: 3,050m2
- No work: 10,100m2 (including ancillary buildings)

Whilst the proposed works will improve compliances of the hospital space standard wise, compliance of M&E services are equally important in the proposed work. A number of department wide the M&E services such as ventilation distribution are in need of replacing and upgrading to meet the HTM standard. Details of M&E works envisaged in all scenarios will be explained in chapter 5.



Minimum scenario stacking diagram



- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

4.3.1 Likely Scenario

The total briefed area in the likely scenario is 27,367sqm including allowances of 12% and 17.5% for communication space and plant space respectively.

As highlighted in the minimum scenarios, there are some common approaches in the proposals for all three scenarios, such as the new admission block, the relocated pharmacy services and mental health element, locations of imaging, day surgery and endoscopy etc. In the likely scenario and the maximum scenario, the focus will be on the major differences from the minimum, which is the bed numbers.

In the likely scenario there are six 24 bedded inpatient ward units assumed, providing 140 generic inpatient beds for the hospital. Though the overall inpatient bed numbers are further reduced compared with the minimum scenario, the overall space requirement for each ward in terms of compliance is still greater than the existing ward footprint can provide.

In this option one new 24 beds ward will still have to be built above block 26; together with reconfigured wards on lower ground floor of block 26 & 27, ground floor of block 26, first floor of block 8 & 9, a total of 6 wards providing 140 HBN compliant beds and ensembles.

The overall inpatient bed number in the likely scenario would be 169 in line with SHP's assumption in the SoA; they include:-

- 140 generic inpatient beds
- 24 admission beds
- 5 CCU beds

Again all of these inpatient beds and ensembles would potentially be HBN compliant in terms of space standard, some derogations against HBN would need to be agreed due to the possibility that a small number of existing structural columns could potentially encroach into the recommended ergonomic zones in the bedroom or ensembles.

Details on location and numbers of the generic inpatient beds in the minimum efficiency option are:-

- Level -1 block 26 & 27 – 48 beds (2 x 24 beds unit)
- Level 00 block 26 - 20 beds (1 x 20 beds unit)
- Level 00 block 27 (new) – 24 beds (1 x 24 bed unit)
- Level 01 block 8, 9 – 48 beds (2 x 24 beds units)
- Level 01(adjacent to MIU) – new admission unit 24 beds
- Level 02 (new above admission unit) – 5 x ICU/HDU beds

With agreed derogations, the estate option for the likely scenario would also achieve a 100% compliance with HBN's recommendations for space and layout of inpatient bedrooms and ensembles.

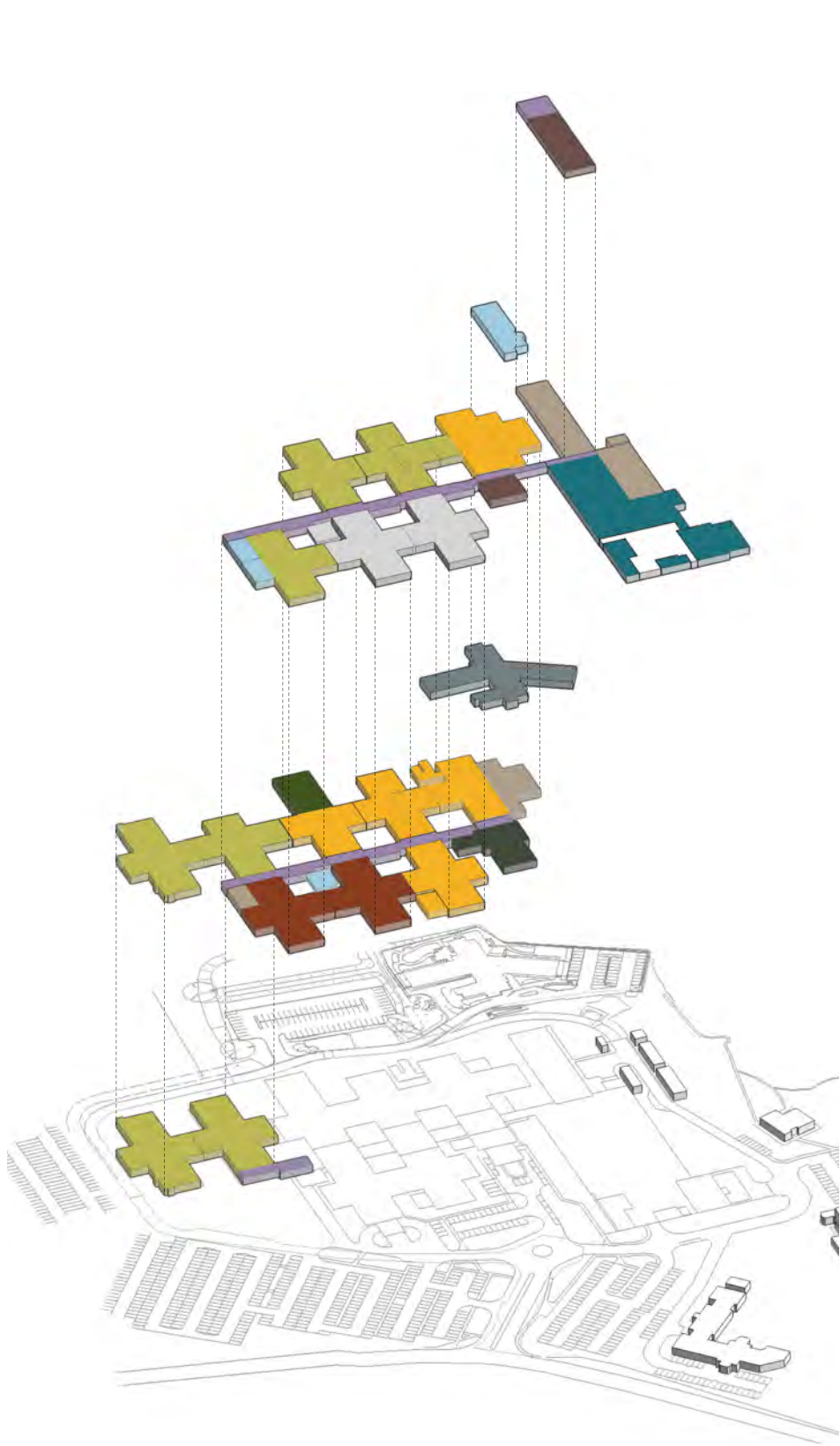
Similarly to the minimum scenario, small part of the hospital such as those in good condition or having no function changes will be left as they currently are, whilst most part of the hospital will be up for a various level of refurbishment, light touch such as new floor or wall finishes, moderate refurbishment or major refurbishment where small or large part of the spaces are to be re-configured for compliance upgrade or functionality change.

In the likely scenario there would be a circa. 4,550m² of new build, including the new 2 storey admission block and one new 24 beds ward unit; this is a one ward less new ward than in the minimum scenario. There is also one less ward proposed for major refurbishment work which would provide an opportunity to expand and modernise part of Outpatients on level 1 block 10.

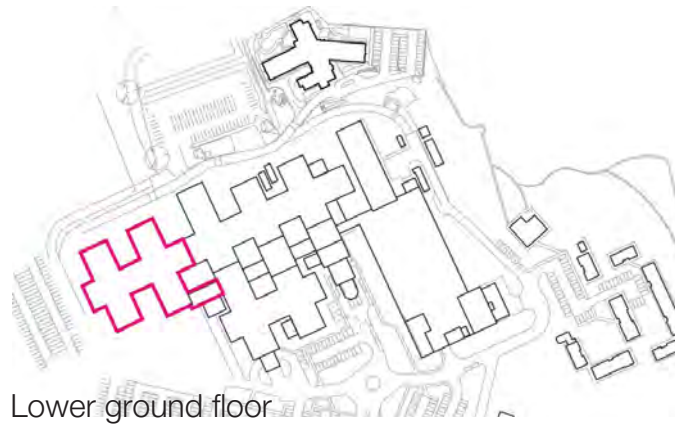
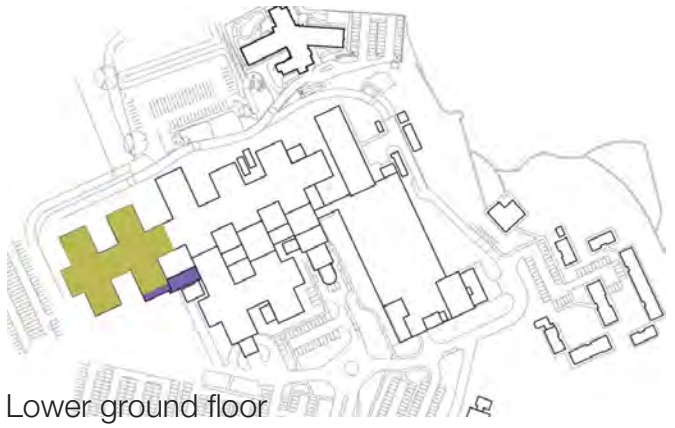
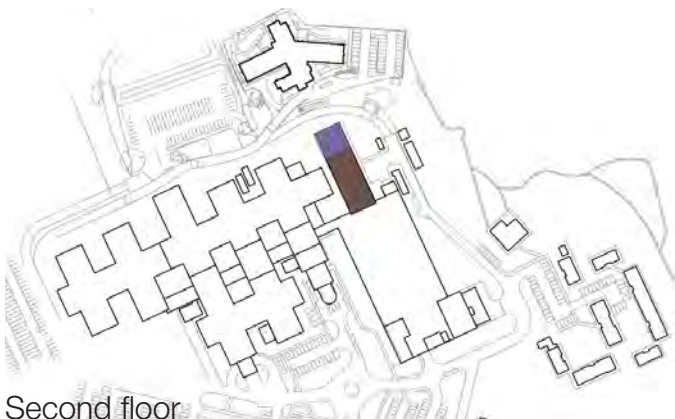
The proposed total area for Prince Philip Hospital in the likely scenario will be circa. 32,600sqm. Approximate area summary of each type of proposed works in this scenario is summarised as below whilst diagrams of proposed work are illustrated level by level on the next page.

- New build: 4,550m²
- Major refurbishment: 11,650m²
- Moderate refurbishment: 3,150m²
- Light touch: 3,150m²
- No work: 10,100m² (including ancillary buildings)

In order to achieve compliance of M&E services as well as in the clinical spaces, upgrading of the existing services and new provisions especially the ventilation distribution system such as air handling units for hospital wide are also strategically considered. Details of M&E works proposed in all scenarios will be explained in chapter 5.



Likely scenario stacking diagram



- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

- Building retained / future use to be established
- As Existing
- New Build
- Major refurbishment
- Moderate refurbishment
- light touch

4.4.1 Maximum Scenario

The total briefed area in the maximum scenario is 25,245sqm including allowances of 12% and 17.5% for communication space and plant space respectively. Compared with the minimum scenario or the likely scenario there are approx. 5,326 sqm less and 2,122sqm respectively for the hospital site.

The difference on site area is reflected from the total generic inpatient bed number being just 100 which only requires 5 24 beds wards. So unlike the other two scenarios, within the existing ward footprint there will be sufficient space to provide five wards of HBN compliant patient bedrooms and ensuites without having to building new. Also unique in this scenario is that there will only be one 24 beds ward in block 26 on the lower ground floor, releasing spaces in block 27 potentially for non-clinical support such as FM and administration. Directly above this ward on ground floor, space in block 26 will be re-configured to have another 20 compliant bedrooms with ensuites with good connection to the lower ground floor ward.

The overall inpatient bed number in the likely scenario would be 129 in line with SHP's assumption in the SoA; they include:-

- 100 generic inpatient beds
- 24 admission beds
- 5 CCU beds

Again all of these inpatient beds and ensuites would be HBN complaint in terms of space standard, some derogations against HBN would need to be agreed due to the possibility that a small number of existing structural columns could potentially encroach into the recommended ergonomic zones in the bedroom or ensuites.

Details on location and numbers of the generic inpatient beds in the minimum efficiency option are:-

- Level -1 block 26 – 24 beds (1 x 24 beds unit)
- Level 00 block 26 - 20 beds (1 x 20 beds unit)
- Level 01 block 8, 9, 10 – 56 beds (1 x 24 & 1 x 32 beds unit)
- Level 01(adjacent to MIU) – new admission unit 24 beds
- Level 02 (new above admission unit) – 5 x ICU/HDU beds

With agreed derogations, the estate option for the maximum scenario would also achieve a 100% compliances with HBN's recommendations for space and layout of inpatient bedrooms and ensuites.

Similarly to the minimum & likely scenarios, small part of the hospital such as those in good condition or having no function changes will be left as they currently are, whilst most part of the hospital will be up for a various level of refurbishment, light touch such as new floor or wall finishes, moderate refurbishment or major refurbishment where small or large part of the spaces are to be re-configured for compliances upgrade or functionality change.

In the maximum scenario the only new build would be the two storey admission block, with a total new build area of 3,400m2 approximately. This new block is proposed for all scenarios providing opportunities for a HBN compliant admission ward and ITU / HDU ward as well as an essential connection to the existing minor injury unit. Similar to the likely scenario, there is also an opportunity to expand and modernise part outpatients on the first floor.

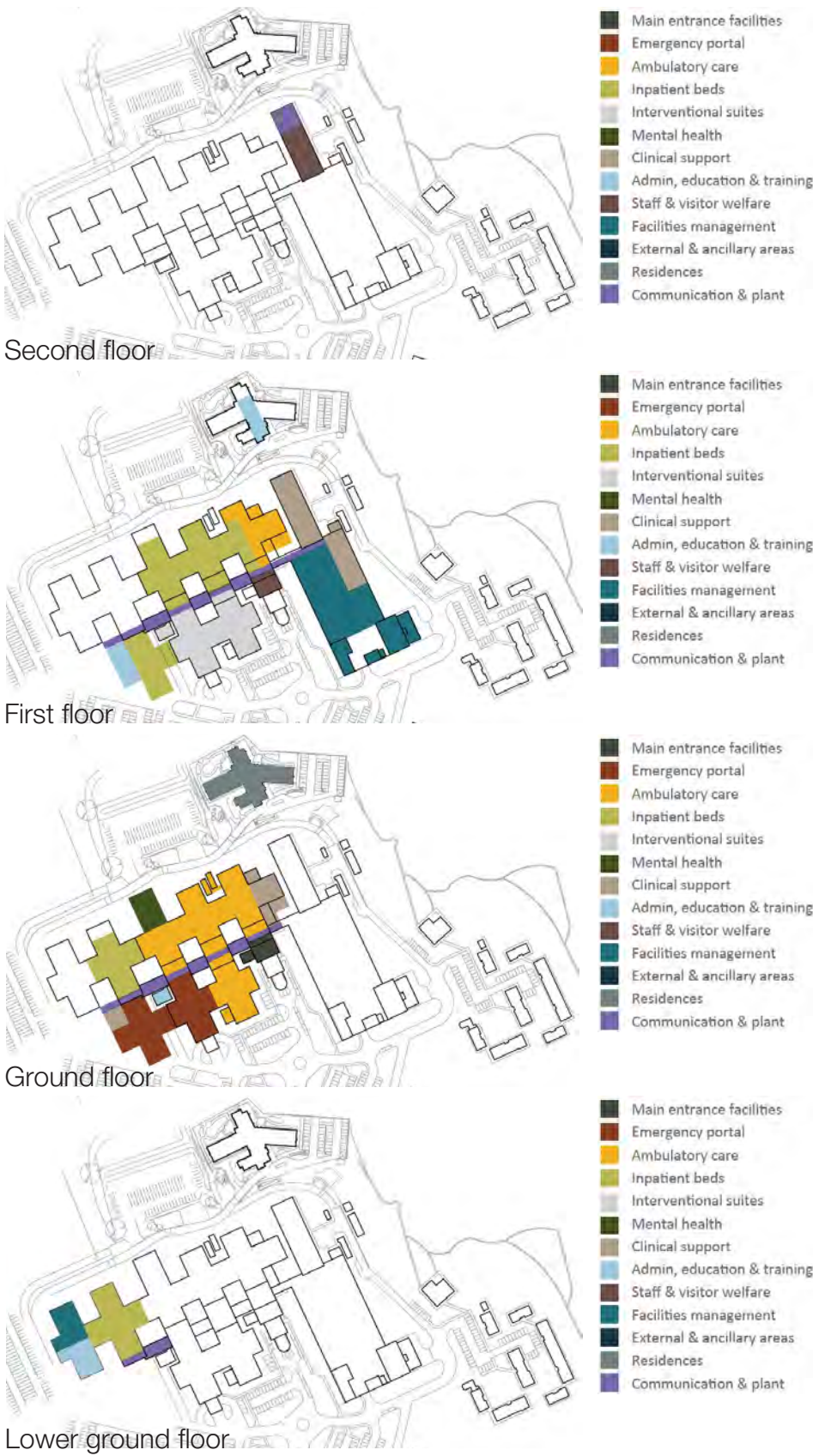
The proposed total area for Prince Philip Hospital in the maximum scenario will be circa. 31,450sqm. Approximate area summary of each type of proposed works in this scenario is summarised as below whilst diagrams of proposed work are illustrated level by level on the next page.

- New build: 3,400m2
- Major refurbishment: 11,650m2
- Moderate refurbishment: 3,150m2
- Light touch: 3,150m2
- No work: 10,100m2 (including ancillary buildings)

Details of M&E works considered site wise in all scenarios will be explained in chapter 5.



Maximum scenario stacking diagram



5.1 Engineering Infrastructure

As noted in summary section of the options. There will be a requirement for both retaining some of the services infrastructure and also provide new services within the buildings. It should be noted that where existing buildings are being retained, there is likely to be challenges regarding mechanical ventilation of these spaces in accordance with the latest guidance. The existing buildings are mostly naturally ventilated and the original floor to floor heights and service voids do not take into account the ductwork requirements. Ductwork routing will need to be considered to have minimal impact on floor to ceiling heights by distributing vertically where possible. Additionally, there is no allowance for the associated air handling units. New plant areas would need to be located in the roof voids in addition to those provided as part of any new builds. This will require careful consideration during any refurbishment works and may require derogations from current regulations.

The existing infrastructure for the site varies in condition. However, all will be reaching the end of its service life within the next 10 years and therefore would need to be considered for replacement as part of the maintenance planning. The ventilation systems are in significant need of replacement and these works should be considered for all areas, even those which are not being refurbished.

Any refurbishment will need to consider current WHTMs and WHBNs are incorporated. Fire compliance and appropriate sprinkler coverage can also be considered as part of these works along with any decarbonisation aspirations.

For new build elements, the move to electricity as the primary fuel source for heating in relation to decarbonisation will increase the load on the incoming electrical supply. Further work will need to be undertaken to determine if the reduction in estate buildings and improvements in the electrical efficiency offsets the additional load or if more primary electrical infrastructure is required. The existing electrical supply arrangement will be reviewed against WHTM benchmarks to check that it provides the appropriate level of resilience.

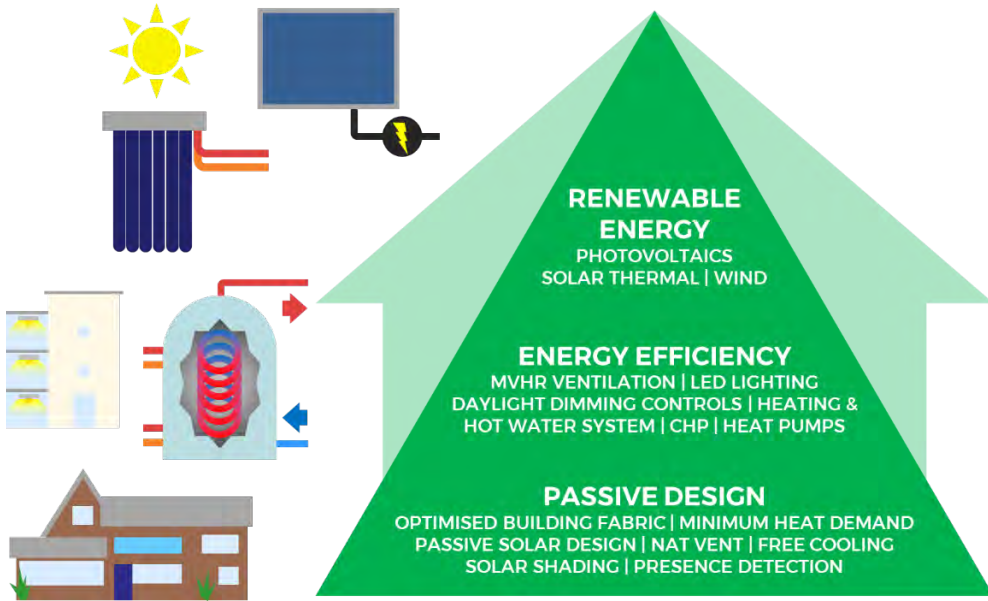
Generator back up of the electrical power will need to be provided to provide the appropriate level of resilience to the electrical system.

New and refurbished buildings would look to minimise heat loss by maximising the thermal performance of the buildings. This will assist in reducing the energy requirements.

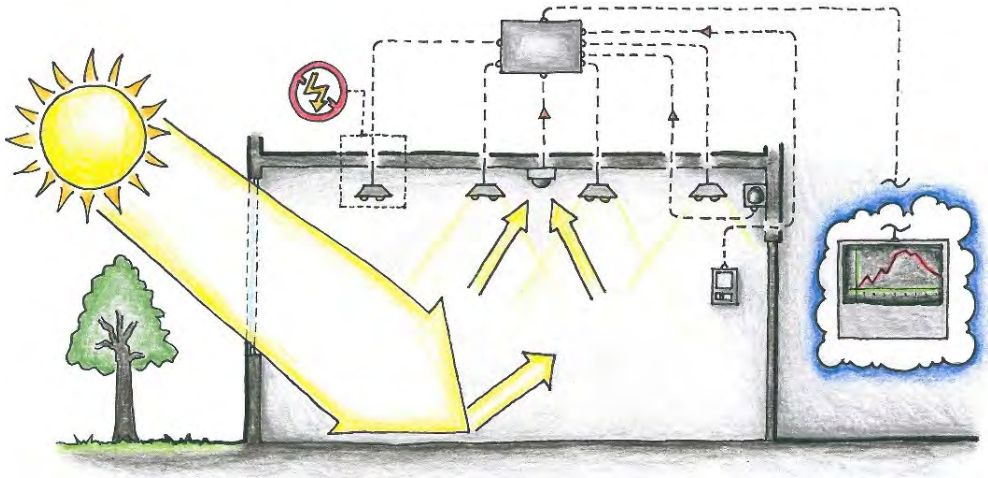
New buildings would also incorporate photovoltaic panels (PVs) to offset energy use.

Incoming telecommunications will be reviewed for their suitability for continued use.

In the “do nothing” scenario or where existing buildings are being retained, it should be noted that work will still need to be undertaken on the services to maintain the operation of the building. Significant amount of plant and services are at the end of their design life and due for renewal. Fire compliance work would also need to be undertaken to ensure that the building is meeting all statutory requirements.



Energy Hierarchy



Automatic Daylight Control

External works

The car parks and access roads are in fair condition, but in need of localised repairs, which should be considered as part of the preferred re-development option.

Civil & Structural engineering: Topography & Geology

There is a gradual rise in elevation from around 15mAOD in the east of the site to around 40mAOD along the western boundary with the main building and car park set at around 20mAOD. The development options include only a small extension to the existing building footprint and will not have any significant external works. In this case, there will not be any significant earthworks.

Civil & Structural engineering: Flood Risk

The Natural Resources Wales plan shows the site to be within Flood Zone 1 which indicates a low risk of flooding from rivers or tidal waters. Surface water flood risk will be managed through the drainage and levels design for each of the redevelopment options. Civil & Structural engineering: Below ground drainage

Surface Water Drainage

The re-development options include a combination of refurbishment, repurposing and new build. The new build element is likely to require an appropriate SuDS (sustainable surface water drainage) system. The requirement to apply SuDS design principles in accordance with Welsh Government’s Statutory Standards would mean the inclusion of surface water treatment & attenuation prior to the discharge to either ground or as per the status quo via the existing surface water drainage system. The management of surface water runoff, both in terms of quantum and quality, would also need to be considered in a holist manner such that flood risk is not exacerbated.

There may also be the need for some reconstruction/realignment/ adaptation of existing drainage systems as a result of the new build element.

Foul Drainage

None of the options result in any significant increase in foul flows discharging to the foul water drainage system and therefore it is unlikely that the scheme would need to upgrade the existing drainage systems, unless it were to carry out necessary maintenance to extend the lifetime of the asset.

6.1 Implementation Strategy

The preferred way forward is to provide a repurposed and refurbish the existing District General Hospital at Prince Phillip. This would be complemented with elements of new build / extension. Main refurbishment works will commence once the Urgent and Planned Care Hospital opens.

This approach provides a period of over 3 years for enabling works such as infrastructure alterations and service diversions to be undertaken to prepare the site for repurposing and a phased redevelopment.

At the same time as infrastructure alterations and service diversions / upgrades the new build extensions to create additional ward space would be constructed. Completing these by the time the Urgent and Planned Care Hospital opens and moving to the new model of care with beds then reducing at Prince Phillip, would create headroom for the refurbishment programme to commence as suitable ward areas would be available for decants.

The whole redevelopment is estimated as being approximately six and a half years and the hospital remaining live throughout the duration of the work.

Detailed sequencing of works has not been considered at this stage although the high-level assumption is that the proposed two storey nucleus block adjacent Block 2 to provide inpatient and administration accommodation would be constructed first. Following this an additional storey would be constructed above the existing Block 20 as the new nucleus template would provide a decant facility for the existing occupants of block 27 to relocate to.

The planned refurbishment programme and sequencing has not been developed and will need to be established during the outline business case stage.

Once mental health inpatient services have moved to the new Urgent and Planned Care Hospital the existing mental health block would be repurposed to provide residences leaving the existing residences as surplus accommodation. This provides an opportunity for repurposing or even demolition to create an area of site for disposal or redevelopment.

Milestone	PPH (refurb)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW frame-work)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Start on site- enabling, ad-vanced work and new built extensions	July/August 2026
Start refurbishment of existing accommodation	October 2029
Construction Completion	July 2032
Commissioning	August - September 2032
Overall Opening and site com-pletion	September 2032
Disposal of any surplus site area	October 2032 onwards

*Table based upon preferred Implementation Option No. 1

7.1 Planning

The hospital is located within the administrative area of Carmarthenshire County Council. The statutory development plan for the hospital site comprises the Local Development Plan 2006 – 2021 (Adopted December 2014).

A review of the LDP commenced in January 2018. The Delivery Agreement dated November 2020 states that the Local Development Plan 2018 – 2033 will be adopted in July - August 2022.

Local Planning Policy

The following adopted Local Development Plan 2006 – 2021 policies are considered to be particularly relevant to the site:

Policy GP1 Sustainability and High Quality Design
The policy indicates that development proposals will be permitted where they conform with a range of criteria to achieve high quality design covering matters including enhancing the character and appearance of the site, utilising appropriate materials and avoiding significant impacts on amenity of adjacent land uses, amongst other criteria.

Policy REC1 Protection of Open Space
The policy states that “Provision will be made to protect and wherever possible enhance accessibility to open space. Proposals which result in the loss of existing open space will only be permitted where:

- a. It is demonstrated that there is provision of at least equivalent value available within the settlement, or where applicable the sustainable community, in an accessible location; and,
- b. It is demonstrated that the need for the facility has ceased; and,
- c. A deficiency of open space is not created through its loss; or,
- d. The re-development of a small part of the site would allow for the retention and improvement of the facility.”

There are 3 areas of protected open space to the north, south east and south west of the hospital site that could limit opportunities for expansion.

The Local Development Plan 2018 – 2033 would need to be considered prior to its formal adoption but afforded limited-moderate weight depending on how far it has advanced at the point of a planning application.

National Planning Policy

In terms of National Planning Policy, Future Wales: The National Plan 2040, Planning Policy Wales and Technical Advice Notes (TAN) would apply to the site.

Future Wales: The National Plan 2040

Future Wales is the National Development Framework for Wales, setting the direction for development in Wales to 2040. Future Wales is a spatial plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

Planning Policy Wales

Planning Policy Wales (PPW) Edition 11 (February 2021) outlines the Welsh Governments land use planning policies. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

Technical Advice Notes (TANs)

TANs provide detailed planning advice to accompany Future Wales and PPW. In terms of Prince Philip Hospital, the following TAN would be especially relevant:
TAN 12 Design

TAN 12 sets out design guidance for developers to adhere to, ensuring that sustainability through good design is promoted within the planning system. Guidance within this note would need to be considered at the design stage, including the production of a Design and Access Statement to accompany the planning application which is a requirement for any ‘major’ development in Wales, this is any development over 1ha.

Paragraph 5.10.1 states that “In the design of schools, hospitals and other buildings and infrastructure intended for use by the local community the aim should be to achieve fitness for purpose, value for money over the whole life of the building, and a positive impact on the lives of those who use it and on its surroundings.”



Extract of Carmarthenshire LDP

8.1 Cost Summary

Works Cost

The redevelopment at Prince Philip Hospital comprises a new two storey extension and the refurbishment of the existing accommodation. The costs for all works are based on an elemental cost per m2, and the traditional approach using DCAGs has not been followed. The rationale for this is that the DCAGs database has not been updated for a considerable time, and there have been several significant changes in both healthcare design standards and planning and building regulations requirements which render the DCAGs unreliable.

New Extension

The basis of the elemental cost is the benchmark cost reports for similar schemes and the Grange Hospital elemental analysis, which takes account of a number of additional cost drivers including further regulatory change and design aspiration, as follows:

- BREEAM 2018 in lieu of BREEAM 2014 – addition 0.75%
- Decarbonisation aspirations – addition 3%
- SMART costs – addition 1% (see Non-works costs for impact on IT costs)
- Biophilic Design aspirations – addition 2%
- Location – addition 2%

The percentage additions were derived from various sources and also take account of the rural area in which the developments will be built.

Refurbishment Works

The basis of the elemental costs for the different types of refurbishment works is benchmark costs, developed using an extensive database of costs, as above. The elemental costs are then adjusted to reflect the scope of the proposed refurbishment works. Three scopes of refurbishment are included – major, moderate and light touch. Approximately two thirds of the existing accommodation is refurbished.

External Works (Oncosts)

The scope of external works has been significantly reduced to reflect the limited scope of site development at Prince Philip Hospital. Demolition costs and phasing costs are included to reflect the scope and extended programme of the works. A benchmark of 18.5% has been included for fees and survey costs. This includes for all principal designers but also the specialist

designers such as acoustic and fire engineers, ecology and BREEAM consultants. Specialist advisors for the Health Board including the District Valuer, Vat advisor and audit services are included.

Non-Works Cost

IT Costs: A meeting has been held with the Health Board’s IT lead. The IT budget reflects the SMART hospital aspirations for the future within the context of a refurbishment scheme.

An allowance of 1% of the Works Cost has been included for art. An allowance for other Non-Works costs has been included benchmarked against the Grange Hospital.

Costs are included for the decant works required to facilitate the phasing. No decant accommodation is included.

The equipment allowances for the new and refurbishment vary to reflect the potential equipment requirements for each function/scope of work.

An allowance of 10% has been included as a Contingency. No provision for Optimisation Bias has been included in the capital costs.

Vat has been included at the current prevailing rate of 20%. Vat reclaim has been included for all design fees.

The capital costs have been costed at 4Q 2021 price levels with a forecast PUBSEC Index of 269. Costs have also been presented at the Business Case Reporting Index of 250. It is recognised that future adjustments to these costs will be made against the Business Case Reporting Index of 250.

8.2 Cost Summary Table

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£7,384,413	£101,468,319	£70,390,500	£65,436,300	£60,661,500
On-costs	Incl	Incl	£7,263,525	£6,983,097	£6,746,744
Location adjustment	Incl	Incl	£0	£0	£0
Fees	Incl	Incl	£14,365,995	£13,397,588	£12,470,525
Non-works cost	Incl	Incl	£9,995,540	£9,874,194	£9,755,082
Equipment costs	Incl	Incl	£5,383,380	£4,983,156	£4,601,172
Contingency	Incl	Incl	£10,739,894	£10,067,434	£9,423,502
VAT reclaim	Incl	Incl	-£2,394,332	-£2,232,931	-£2,078,421
Project cost	£7,384,413*	£101,468,319	£115,744,502	£108,508,838	£101,580,104

* Cost at March 2021 Price Level

Note:
All figures listed above in black are
gross costs inclusive of VAT

Hywel Dda University Health Board

A Healthier Mid & West Wales: Transforming our Hospitals Programme Business Case

Estates Annex: Appendix D Withybush Hospital

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Revision History

Rev	Date	Revision Description	Issued By	Checked By
Rev 0	17.01.2022	Issued for Health Board Review	SW	ND

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- 1.** Description
- 2.** Existing Estate
- 3.** Summary of Proposed Functional Content
- 4.** Estates Options
- 5.** Engineering Infrastructure
- 6.** Implementation Strategy
- 7.** Town Planning Considerations
- 8.** Cost Summary

Withybush Hospital

Withybush Hospital

1.0 Description of the Hospital

Withybush General Hospital is located in the town of Haverfordwest. It is situated to the north of the town centre, along Fishguard Road and close to the A40 link road which connects Carmarthen and the M4 to the port of Fishguard. The site occupies approximately 8.31 hectares and is relatively flat sitting on a high level escarpment which falls away to the west down to the Western Cleddau River. The site is bounded to the north and south by out-of-town retail centres and to the east on the opposite side of Fishguard Road by low rise residential areas.

Haverfordwest was originally served by the Pembrokeshire and Haverfordwest Infirmary (1859) located adjacent to St Thomas' Green in the centre of the town. The hospital was renamed 'County Hospital' in 1919 and prior to the Second World War expanded to include the adjacent workhouse. During the Second World War a military hospital was established in the Prendergast area of the town made up of series of Nissen huts. This hospital later became known as 'Withybush Hospital' and following the approval to build a new general hospital in the town in the early 1970's was cleared as a site for the new development although the original name was retained.

The new Withybush Hospital was built between 1973 and 1978 at a cost of £7m. It was officially opened in 1979 and included 314 beds and a 24/7 accident and emergency department. The original development also included a number of four-story staff residential units which remain to the east of the main hospital building. The current hospital has a gross internal area of 39,477sqm and key clinical functions include 213 inpatient beds, an Emergency and Urgent Care Centre, diagnostic imaging including MRI, operating theatres, outpatients and a Renal Dialysis Unit built in 2014.

The building has received limited capital investment since opening and as result much of the internal and external fabric of the main building is generally in a poor condition. Externally the concrete façade is in poor condition with reports of water ingress in multiple locations. The majority of the external windows were replaced within the last 15 years but are now also suffering with water ingress. There is also known to be asbestos in some areas of the façade such as asbestos rope and packing materials around window and door frames. The original flat roof was replaced with a pitched roof structure in the early 1990s but with little maintenance in the intervening period this roof is also now suffering with water ingress.



Withybush Hospital 1978



Withybush Hospital

There are known statutory compliance issues with the hospital including those relating to electrical systems safety, asbestos, control of legionella and general Health & Safety at Work issues. It is understood that many of these issues cannot be resolved without major reconfiguration and potential loss of bed numbers. The most significant statutory compliance issue relates to fire safety and an enforcement notice was issued by Mid and West Wales Fire and Rescue Authority in August 2019. The Health Board are currently preparing a business case to support the delivery of remedial works to bring the building fabric up to statutory compliance.

The configuration of internal spaces reflects the timing of the construction in the late 1970's and much of the internal layouts are no longer suitable for the delivery of safe clinical care. Many of the rooms are undersized when compared to current guidance which reduces flexibility, impacts privacy & dignity increases infection risk and makes safe manual handling more difficult to achieve. Many of the patient beds are arranged in 6 bed bays which are no longer recommended and the proportion of single rooms (26%), falls below current recommended standards. Very few bedrooms are equipped with en-suite facilities.

Staff facilities are also known to be below standard with reports of insufficient support spaces such as staff rooms, toilets, changing facilities and office accommodation.

A review of the physical condition of the engineering systems carried out in 2017 identified a number of key issues including the need to update electrical infrastructure, nurse call and bed head services, hot and cold pipework and heating infrastructure. A number of major plant items were also identified as being 'end of life' including chiller plant, LTHW boilers, foul water pumps and a number of AHUs.



2.1 Site: Massing

Withybush General Hospital is situated to the north of Haverfordwest town centre occupying a relatively flat site of approximately 8.31 hectares adjacent to Fishguard Road. The site is bounded to the north and south by out-of-town retail centres and to the east on the opposite side of Fishguard Road by low rise residential areas. To the west the site is bounded by a line of mature trees and a steep slope down towards the Western Cleddau River. The remainder of the site is characterized by low landscape planting and extensive car-parking.

The site is accessed from two separate locations along Fishguard Road although ultimately all staff, public and blue light traffic flows through a single roundabout outside the main entrance. A secondary access for FM traffic runs adjacent to the retail park to the South and connects to a one-way hospital ring road providing access to the estates and facilities accommodation situated on the western boundary of the site.

There are two main groups of buildings on the site; the original three story hospital building from the 1970's which has been extended a number of times including most recently a renal unit adjacent to the front entrance, and a group of staff residences to the north east of the site which were part of the original construction.

The main hospital building is clad in concrete panels with strip windows which are generally UPVC. It has a pitched concrete tile roof which was added in the 1990's to address water ingress issues with the original flat roof. The staff residences are generally brick with UPVC windows and detailing. Newer extensions to the main building consist of terracotta cladding, brickwork and render with aluminium windows and detailing.

There are a number of single storey temporary building to the north west of the main building and an energy centre and boiler flue adjacent to the estates buildings to the west of the ring road.



Site Plan - Figure Ground

2.2 Site: Urban Context and Planning

Withybush General Hospital is situated to the north of Haverfordwest town centre occupying a relatively flat site adjacent to Fishguard Road.

The site is bounded to the north and south by out-of-town retail centres and to the east on the opposite side of Fishguard Road by low rise residential areas. To the west the site is bounded by a line of mature trees and a steep slope down towards the Western Cleddau River.

The current Local Development Plan identifies a ‘hospital extension’ development site within and adjacent to the northern boundary of the site – earmarked for a community facility.

There are currently no listed buildings or tree preservation orders on the site.



Site Plan - Planning

2.3 Site: Clinical Zoning

Clinical services currently provided at Withybush Hospital include;

- Accident & Emergency
- Diagnostic Imaging (X-ray, CT, MRI)
- Planned care
- Unscheduled Care
- Ambulatory care
- Surgery & Day surgery
- Critical Care Unit
- Endoscopy
- Midwifery

The hospital also includes inpatient wards with 213 inpatient beds covering the following specialities;

- General Medicine
- Trauma & Orthopaedics
- Midwifery
- Haematology
- Gynaecology
- Stroke Rehab
- General Surgery
- Stroke

The latest Estates and Facilities Performance Management (EFPMS) data confirms the overall gross internal floor area as 39,477sqm

Existing clinical adjacencies are highlighted in the adjacent floor plan diagram and on the following pages.



Site plan - Lower ground floor



Site plan - Ground floor



Site plan - First floor



Site plan - Second floor

2.4 Access & Movement: Site Access & Parking

Vehicular access to the site is via two separate junctions onto Fishguard Road to the East of the hospital site. Within the site a ring road runs around the main building which is part two-way and part one-way.

Visitor and staff parking is spread across the site with the main public car park located adjacent to the site entrance. All parking is on-grade.

The current Data Report suggests that there is a total of 1,093 parking spaces available on the site, of which 41 spaces are designated disabled parking spaces and 733 are dedicated for staff.



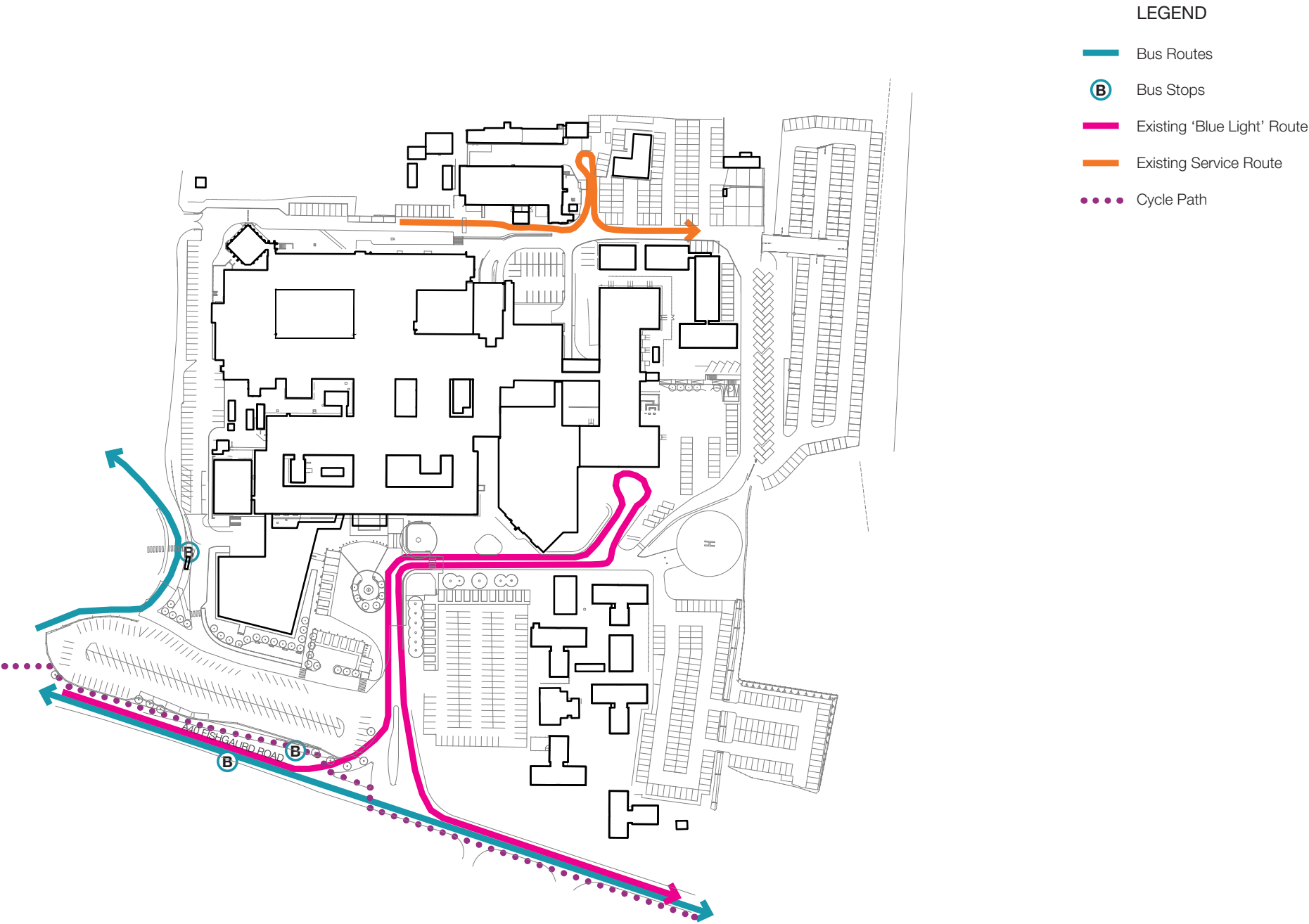
Site Plan - Car Parking

2.5 Access & Movement: Emergency & Service Access and Public Transport

The Emergency Department at Withybush is located to the north of the main entrance at the front of the hospital. The ‘blue light’ access route to the ground floor Minor Injuries Unit follows the same route as all other site traffic. There is a dedicated ambulance drop-off and parking zone outside the MIU entrance.

Facilities Management and deliveries access to the Hospital is via a separate access road from the retail area to the south and then the hospital ring road. The main estates building is located to the west of the site and a designated goods delivery area is provided within this zone area to prevent disruption to other site traffic.

There are public bus stops to the east of the site adjacent to Fishguard Road but no services come onto the hospital site. There is also a cycle route running alongside Fishguard Road but there is no direct connection into the hospital site.

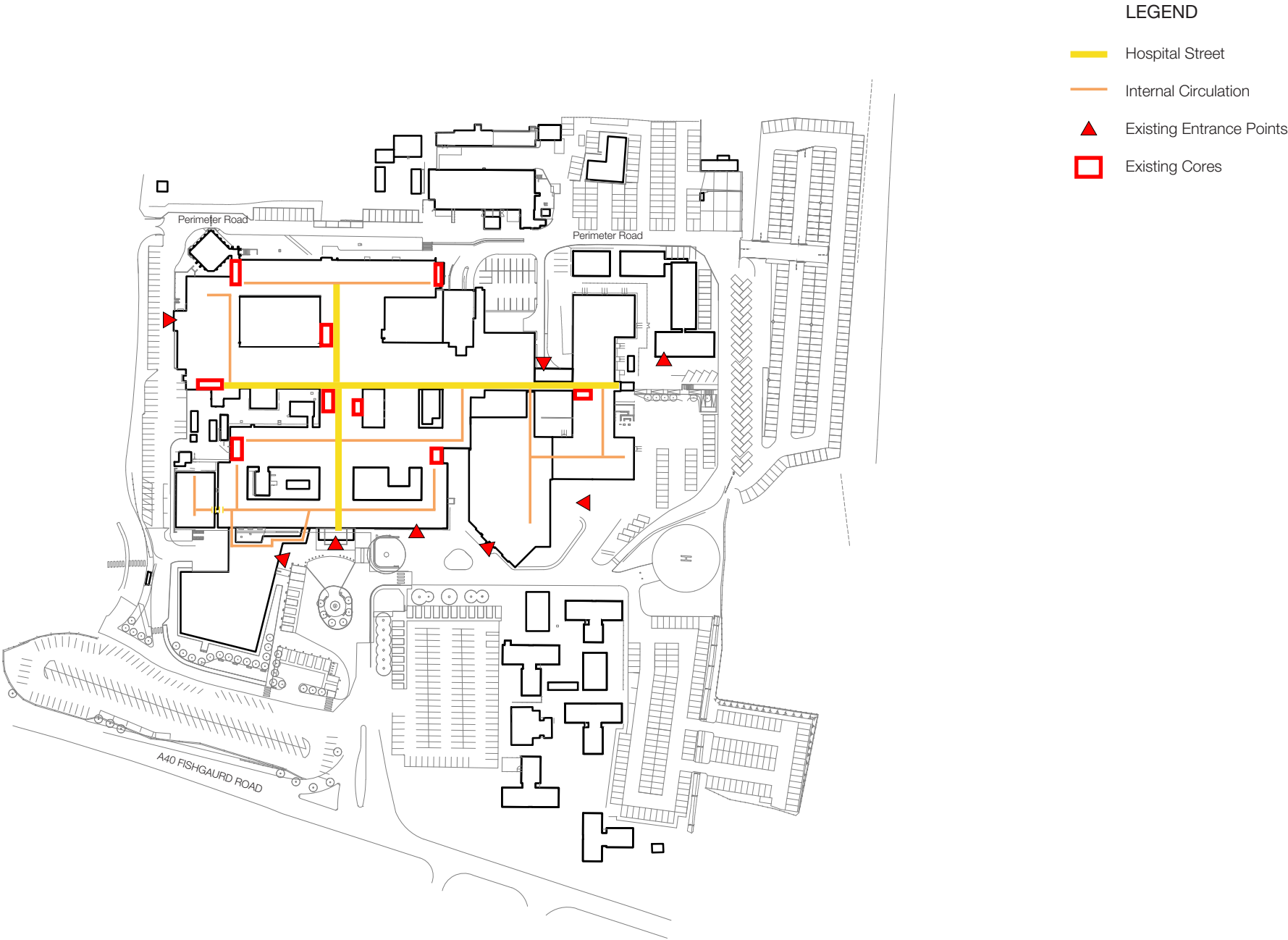


Site Plan - Public Transport and External Circulation

2.6 Access & Movement: Internal

There are various access points around the perimeter of Withybush Hospital however the main entrance concourse is accessed from the East facing the main vehicular site entrance and bus stops.

Entrance via the concourse will lead you to the hospital street from which Individual corridors and vertical circulation cores lead into the individual departments across the various site levels.



Site Plan - Internal Movement

2.7 Estate Condition

Hywel Dda University Health Board owns and leases building which range from 19th Century to modern day with varying degrees of functionality, condition and performance. 40% of the estate is over 50 years old but at Withybush, all of the estate has been built within the last 45 years.

Despite the relatively modern construction a significant number of the internal spaces do not meet current Welsh Health Building Note standards and this impacts service delivery and patient experience.

The total backlog maintenance value across the four acute sites was £62.9m in March 2021 of which circa £40 million is categorised as Significant Risk. At Withybush Hospital the total backlog maintenance cost at March 2021 is £18.8m with £12.9m categorised as significant risk. It is important to note that in developing areas to meet current guidance capacity may need to be reduced.

The majority of buildings on the Withybush General Hospital site were constructed in the 1970's and officially opened in 1979. A new Emergency and Urgent Care Centre was opened in 2010 and a new Renal Dialysis Unit opened in 2014. There has been limited investment since the opening of the original building and most areas of the hospital now require comprehensive refurbishment. This process has commenced with refurbishment of the Pathology department and some ongoing ward refurbishments.

The adjacent diagram and those on the following pages illustrate the key challenge in that the majority of buildings ranked as condition C are the original buildings, including the residential blocks. The original clinical block is surrounded by more recent extensions which are generally condition category A/B.

Investment is required in several areas to remove significant infrastructure risks such as the following key risks identified on the latest backlog maintenance schedule (March 2021);

- Fire compartmentation upgrades and fire door replacement
- Replacement of roof covering to main hospital block
- Replacement of heating control valves generally
- Replacement of air handling units
- Improvement required to medical gas distribution infrastructure
- Nurse call system requires replacement
- Concrete external cladding requires repair/replacement generally
- Electrical systems installation require upgrading



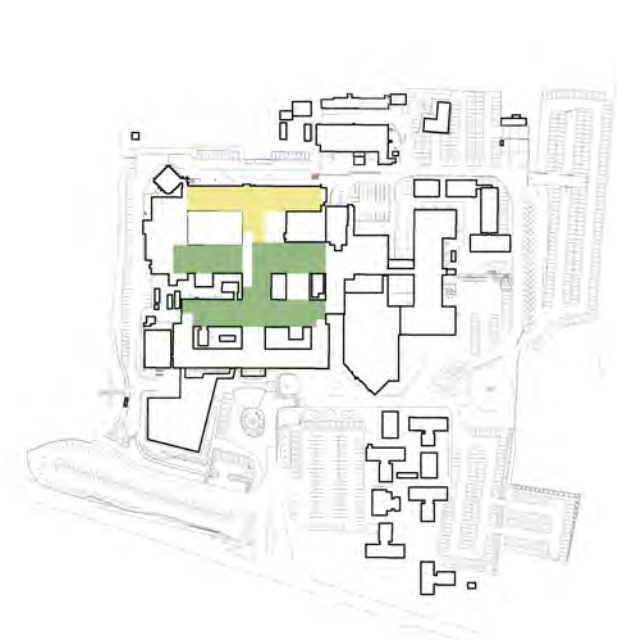
Site plan - Estate condition lower ground floor



Site plan - Estate condition ground floor



Site plan - Estate condition first floor



Site plan - Estate condition second floor

2.8 Services infrastructure: Electrical

High Voltage System

The site is served by 2No Western Power distribution owned and operated High voltage feedert 11kV terminating in HV Switches.

The HV Switches feed 2 No. 1.5MVA 11/0.4kV oil cooled transformers.

Low Voltage System

Main LV Switchboard

The main LV switchboard is an Essential/Non-essential services board with ACB bus coupler between the sections. The 2 No generators serving the site connect onto the main switchboard directly.

LV Distribution

The siote is served by LV ringmains. The cables and switchgear are generally in poor condition and require replacement.

On site Generation

Generator

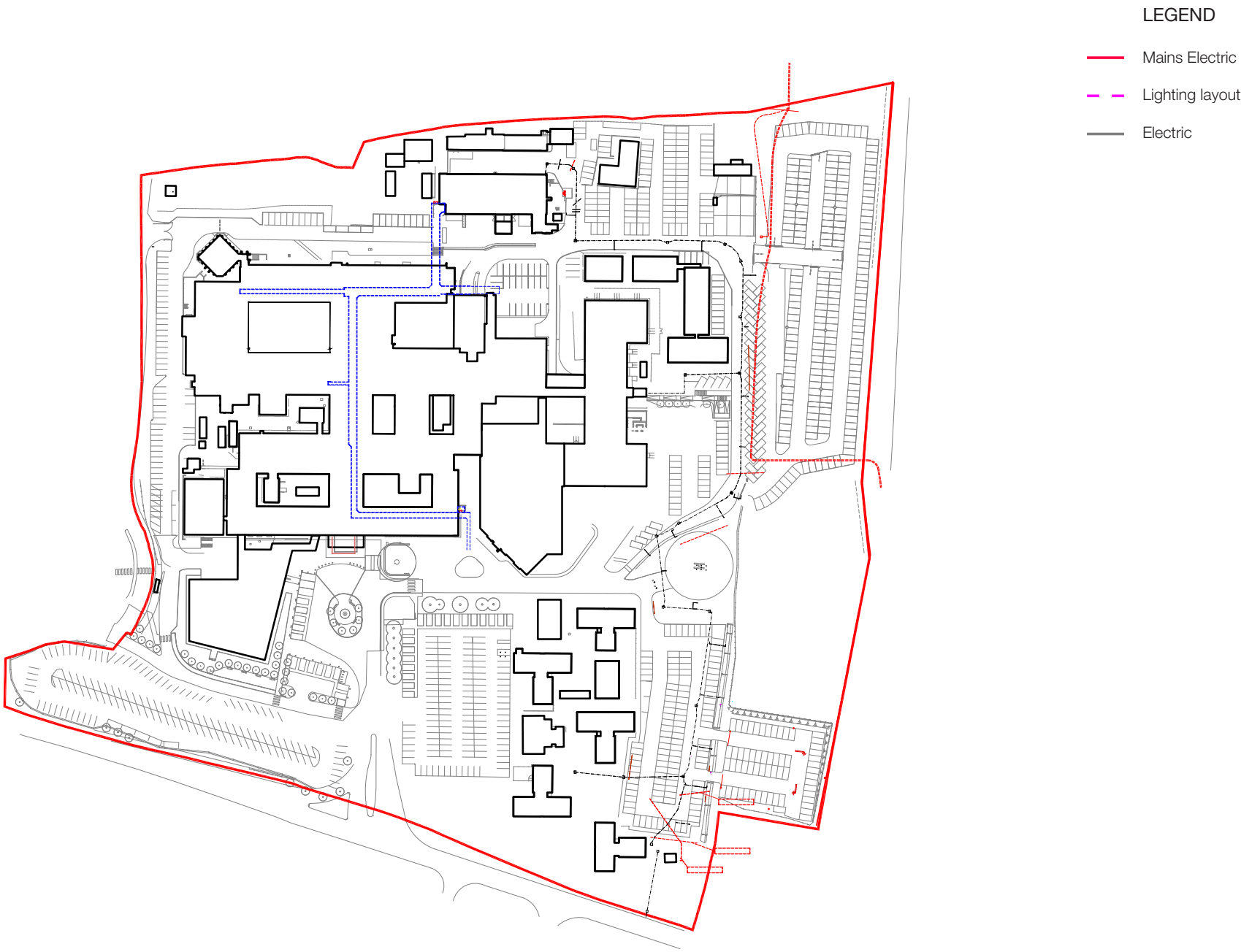
A single 1.85MVA diesel internal combustion engine is installed to provide 100% back up to the site. This is configured to start automatically on mains failure. An additional 800kVA generator is installed which can be manually switched in and provides essential service standby generation only. Both generators are approximately 15 years old.

CHP

A 600 kW CHP was installed in 2014. The unit can generate approximately 75% of the sites electrical demand..

Photovoltaic

A small 12.85 KW solar PV array was installed on site in 2012. The units are capable of provided circa 13,200 kWh / annum.



Site Plan - Electrical Infrastructure

2.9 Services Infrastructure: Mechanical

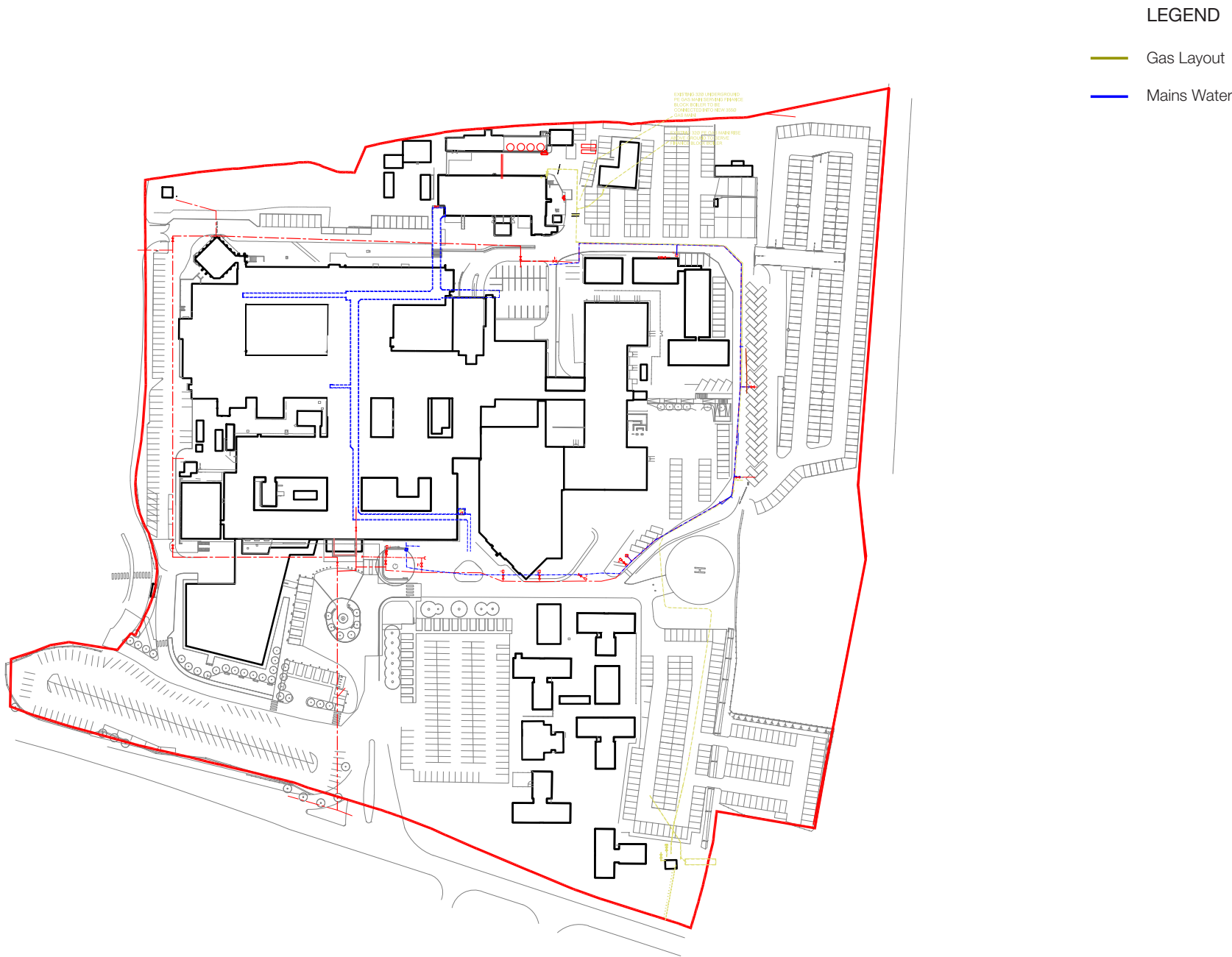
Much of the infrastructure dates from the original build. Some of the distribution has been replaced over the life of the hospital but the majority of these replacements have been local, linked to specific issues and primary routes. Despite maintenance and repair, much of services infrastructure has now reached the end of its service life.

Heating Systems

The majority of the site, including the residences and office buildings, are supplied via the main boiler house. Heating is provided via 5 dual fuel boilers; three (circa 10 years) produce steam and two older units provide LTHW. Heat from a CHP unit is the primary source of LTHW.

From the boiler house steam, LTHW, DHW are distributed via the duct system. Local plate exchangers are located throughout the site's plant rooms to provide air handler heating batteries as well as additional perimeter heating. Heating throughout is provided by LTHW radiators via a zoned variable temperature heating water, although extensive failure of the control values has occurred reducing the control efficiency. The majority of heat emitters and pipework are original with only local modifications carried out in certain areas.

The new renal unit utilised 3 LTHW gas boilers to supply the building.



Site Plan - Mechanical Infrastructure

Ventilation Systems

General wards are naturally ventilated via openable windows.

Ventilation is provided via 25 AHU to a variety of departments including operating theatres, endoscopy, HSDU, pathology and renal. The majority of units are circa 20 years old and predominantly situated in central courtyard and roof top plant rooms. 100% outdoor air is provided and most include air-side heat recovery. The majority of the AHUs are due for replacement as they have reached the end of their service life.

Cooling

The main chiller plant serves the HSDU, operating theatres, CT Scanner and Xray departments. These are approx. 15 years old and in poor condition. The large chilled water plant provides cooling to circa 20 AHUs. Five other AHUs located around the site use local DX units (10 years). Circa 50 small split units provide local comfort cooling around the site, controlled locally by users.

Steam

Steam generated in the boiler house is used for LTHW, DHW and process use on site e.g. HSDU sterilisation and kitchen equipment.

Water

Domestic water is provided via 1 main 65mm supply, held in a large storage tank to ensure a constant water pressure. Additionally, a circa 10 year old borehole it utilised on site. When fully operational this can provided up to 40% of the sites water demand. Issues have been experienced in the past regarding the quality of the water (disrupted by local building work) blocking filters and also with incoming water temperature.

The boiler house is the primary source of DHW on site via a plate heat exchangers.

Main domestic hot water supply pipework within the service tunnels has been replaced, however, distribution in ward areas is original. Extensive replacement of the domestic water system would be required to bring it up to current WHTM requirements for temperature monitoring and legionella control.

A&E and Renal Unit are served by dedicated plant approx. 10 years old and in good condition.

Foul Drainage

Above ground drainage is original to the construction of the buildings, with local modifications and repairs carried out.

Medical Gasses

Medical gasses have been well maintained but will require local upgrade to meet current WHTM standards. Main plant appears to be in good condition.

2.10 Civil & Structural Engineering: Below ground drainage

The drainage system within Withybush Hospital consists of separate foul and surface water systems.

Surface Water Drainage

The surface water discharges via a network of gravity sewers to a land drainage system to the west of the site. There are reported problems with the condition of the surface water sewers within the distributor road in the southern part of the site and the associated reduction in capacity has caused several minor flooding incidents in this part of the site.

Foul Drainage

The site is served in the main by a network of gravity sewers that convey the foul water generated by the hospital to a pumping station in the north east of the site. The pumping station pumps flows to the public sewerage system in Fishguard Road at the front of the site. There are no reported issues with this system.

The Renal Unit is served by a small package pumping station which discharges via a short length of rising main into a foul gravity sewer in the main car park at the front of the site. The gravity sewer connects into the public sewerage system in Fishguard Road at the front of the site. When the public sewer surcharges, sewage backs up into the hospital's drainage system and has on occasion been known to flood out of a manhole cover in the car park. If the foul sewage were to spill into the site's surface water system then a pollution incident could occur in the downstream system.

Dwr Cymru Welsh Water Asset plans only show there to be a foul sewer network which runs south in Fishguard Road.



Site Plan - Drainage Infrastructure

2.11 Civil & Structural Engineering: Topography & Geology

Withybush Hospital is positioned generally on relatively flat land with a ground elevation of approximately 30m. Beyond the western boundary the land slopes towards the Western Cleddau River.



Site Plan - Topography

2.12 Civil & Structural Engineering: Flood Risk

Rivers/Tidal – The Natural Resources Wales plan shows the site to be within flood zone 1 which indicates that the risk of flooding from rivers or tidal waters risk is low.

Surface Water – The site generally has a low risk of surface water flooding. The Natural Resources Wales plan shows that there are two high risk areas to the north east and south west of the hospital, they are small in relative to the hospital and reflect low-lying areas on the site.



Site Plan - Flood Risk Assessment Map

2.13 Existing Structures

External condition

Withybush General Hospital is based on a cruciform template design, three storeys high with a part basement. The hospital was built in the 1970's and has a pre-cast concrete frame and floor structure, with precast concrete wall panel cladding and ribbon windows. A new steel framed pitched roof with concrete tile covering was built over the original flat roofs during the 1980's.

A new postgraduate centre was built at the southern end of the site in the 1980's, and comprises load bearing facing brick cavity walls with pitched roof. More recently a new renal dialysis unit, and an emergency unit with theatre facilities were built during the 2000's. The renal unit is a steel framed structure with rendered masonry cavity walls. The emergency unit has a steel frame and block work external walls with either terracotta rain screen cladding or render finish, and aluminium framed curtain walling.

There are a number of small, single storeys, prefabricated and volumetric modular buildings at the rear of the site, housing paediatric services, finance & procurement and administrative services.

While the main structure is sound there are a number of significant concerns which include:

- The concrete tile roof covering is operationally unsound and needs replacement. Leaks are widespread, and the water penetrates through the existing flat roof structure to affect clinical areas below.
- Furthermore, the concrete tiles are frequently dislodged during stormy weather.
- Some precast concrete cladding panels, and particularly those exposed to prevailing winds are starting to allow water ingress, and the mastic pointing to panel joints is starting to fail.
- Some concrete cladding panels are spalling, and the steel reinforcement is corroding. These need continued repair.
- The windows are reaching the end of their functional life, and require major repairs or replacement.
- Some replacement uPVC windows have not been installed correctly and are leaking.
- The prefabricated buildings at the rear of the site are reaching the end of their serviceable life and require replacement.
- Recent development in the area has overloaded the existing combined sewer system. Consequently the system overflows

during prolonged periods of heavy rainfall causing significant issues on site. The matter has been brought to the attention of the local water authority, and is an ongoing concern.

Internal condition

Internal core and shear walls are in-situ concrete construction. Other partition walls are construction with plasterboard linings fixed to a metal framework. Original partitions often contain asbestos insulating board. The internal fabric and finishes are generally in fair condition but showing signs of fatigue, with localised areas of impact damage, and water damage caused by leaking roofs and windows. While some departments have benefited from remodelling and refurbishment in recent years, others are in need of full refurbishment.

The main areas of concern are as follows:

- There are unsuitable floor finishes in some area, and these require replacement.
- Suspended ceilings in some areas require major repair or replacement.
- Many internal doors show significant signs of wear and tear, and are in need of replacement.
- Ironmongery is also often unsuitable and requires replacement.
- Floor screeds are breaking down in many areas and require major repair or replacement.
- Many fixtures and fittings, including storage units and nurse bases, are damaged, in poor condition, fatigued, and require replacement.
- Asbestos insulating board has been widely used in the construction, including: under floor duct covers,
- internal partitions, and boxing to soil and rainwater stacks.

External works

The internal road network, visitor and staff car parks are macadam surfaced and generally in fair condition, with localised crumbling and ponding. There is evidence to suggest that the road foundation is inadequate along the access road that runs around the south and west of the hospital however. Footpaths have macadam, precast concrete flag, or in-situ concrete surfaces and are generally in fair condition, with level and even surfaces. Minor repairs required.

2.14 Site: Fire assessment

In 2019 following a site inspection of Withybush Hospital, The Mid and West Wales Fire and Rescue Authority (MWWFRA) issued an enforcement notice (EN/262/06 dated 8 August 2019) requiring the Health Board to implement a number of specific changes before the end of November 2019. The enforcement notice was issued due to failure to comply with provisions of the Regulatory Reform (Fire Safety) Order 2005 because people were unsafe in case of fire.

Subsequent fire notices were issued by MWWFRA in late 2019 and early 2020 relating to St Caradog’s ward, Bro Cerywn, St Non’s and St Brynach wards and the on-site residential accommodation. In order to maintain the safety of staff, patients and visitors to the Withybush site, the UHB are required to comply with the MWWFRA fire enforcement notices. Failure to comply could result in prosecution and potentially an enforced closure of buildings.

Following the issue of the notices the UHB agreed with MWWFRA a series of actions which prioritised essential works required to be addressed immediately. These included clearing obstructed fire escape routes, maintaining fire doors and emergency lighting and testing dry riser systems.

Other items from the list of improvements required by the fire notice included repairs to existing compartmentation construction, replacement of fire resisting doorsets and fire dampers.

Replacement of these items requires significant investment and the UHB have engaged a supply chain partner through the Designed for Life framework to investigate the requirements in more detail and prepare an outline business case for the remedial works.

The Outline Business Case identified work as two separate phases depending on priority to life safety. Phase 1 focusses on completing upgrades to all 1-hour fire compartmentation including fire doors and fire/smoke dampers and works to escape routes. Phase 2 covers upgrade to 30 minute sub-compartment walls, including fire doors and fire dampers and hazard room construction.

The business justification case for phase 1 was approved in August 2021 and works are currently progressing on site. The business justification case for phase 2 is planned for submission to the Welsh Government in October 2022.

2.15 Opportunities and Observations

The 2020 Health Board Annual Report identified a number of key projects at the Withybush site to address specific clinical needs including;

- MRI Scanner
- Aseptic & Radio Therapy Suite
- X-Ray replacement
- Pharmacy Improvement Works

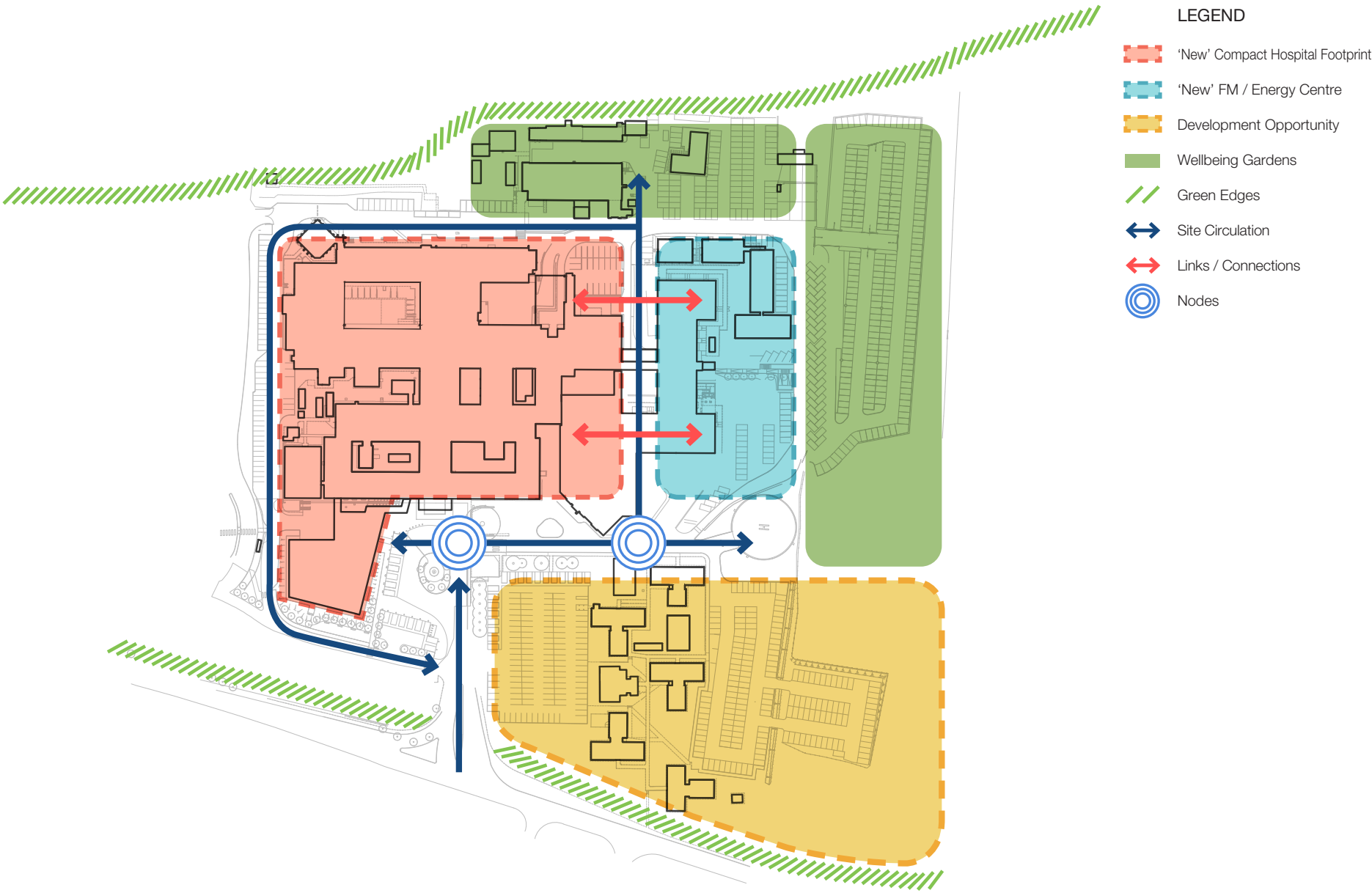
With regards to the building fabric there is a critical opportunity to assess the energy performance of the existing buildings and consider opportunities to incorporate low carbon technologies to support a move towards net zero carbon. This may include new engineering services plant and infrastructure as well as upgrades to the building fabric.

Buildings on the site have a range of conditions and functional suitability although the building which is in most need of repair is the original 1970's block which is embedded in the heart of the site and surrounded by newer buildings making it more difficult to refurbish or redevelop whilst maintaining the current clinical services.

The Health Board are currently developing an outline Business Case to support a series of fire protection upgrade works within existing departments in order to improve compartmentation and enhance life safety measures.

As part of a wider site redevelopment strategy there may be an opportunity to demolish or re-develop some of the peripheral buildings around the site such as the existing staff residences and estates areas. These developments could help expand the current clinical services in modern fit-for-purpose accommodation, or provide opportunities for other health related services. These developments could also enhance the character of the site, creating landscape areas to enhance the wellbeing of patients and staff and improve staff retention.

A separate Programme Business Case has been developed to look at the completion of critical backlog maintenance on all of the Health Board sites with a view to maintaining business continuity during the development and delivery of this Programme Business Case. This detail will help to inform the development of the Building Engineering Services strategy moving forward. It may be that some maintenance activities are deferred in favour of new developments.



Withybush General Hospital



Site Plan - Opportunities

3.1 Summary of High Level Brief

The Health Board ten-year health and care strategic vision (“A Healthier Mid & West Wales: Our Future Generations Living Well”) sets out the strategy for whole system change following the outcome of its previous public consultation exercise in November 2018.

The strategy describes the commitment to work in an integrated way across health and social care at a local and regional level, placing significant emphasis on the people and communities which access services provided by the Health Board.

During the initial consultation phase the Health Board identified a number of key challenges which underpin the need to transform the way in which the health and wellbeing of the local communities are supported;

- Demand on health and care services is increasing all the time as more people will be living longer with complex conditions requiring care and treatment.
- Providing services which are accessible and equitable, regardless of location is made more challenging due to the geographic context.
- A large proportion of the area covered by the Health Board is rural and isolated, which creates challenges for providing services to people in their own homes.
- People want and expect to be supported to manage their health in their own homes.
- There are variations in service provision and health outcomes across the three counties, for example there is a 10-year gap in healthy life expectancy across the area.

The consultation phase culminated with the Health Board describing a future model of care based around a network of integrated health & wellbeing centres and community hospitals which will bring key services and staff together in one place and provide virtual links between the local population and specialist services at the acute hospital sites.

The estate strategy which supports this model of care, known as ‘Proposal B’ considers the future transformation of the acute hospital estate and the associated implications on the community infrastructure. It includes provision of a new urgent and planned care hospital in the south of the region which will centralise all specialist children and adult services. The hospital sites at Withybush and Glangwili will be repurposed as community facilities with beds. Prince Philip and Bronglais hospitals in Llanelli and Aberystwyth will remain as general hospitals with refurbishment works as necessary to support the overall changes to the service model.

The proposed changes create significant opportunities to make better use of resources, make the most of technology, and ensure services are high quality, deliver an excellent experience for patients and attract a highly motivated and skilled workforce.

The findings from the phase 1 consultation process led to the Health Board defining four key principles to underpin the development of local future health and care services: Safe, Sustainable, Accessible and Kind. These guiding principles will be followed throughout the transformation programme.

Through the development of the briefing information the Health Board have identified a range of service transformation scenarios which are primarily driven by assumptions on future bed numbers. These are described as follows;

‘Do nothing scenario’ where the current service is retained with no major reconfiguration or transformation.

‘Do minimum scenario’ where the current service is retained with minor transformation of services to align with the AHMWW strategy and with focussed investment in new community projects and to bring the acute hospital estate up to Condition B.

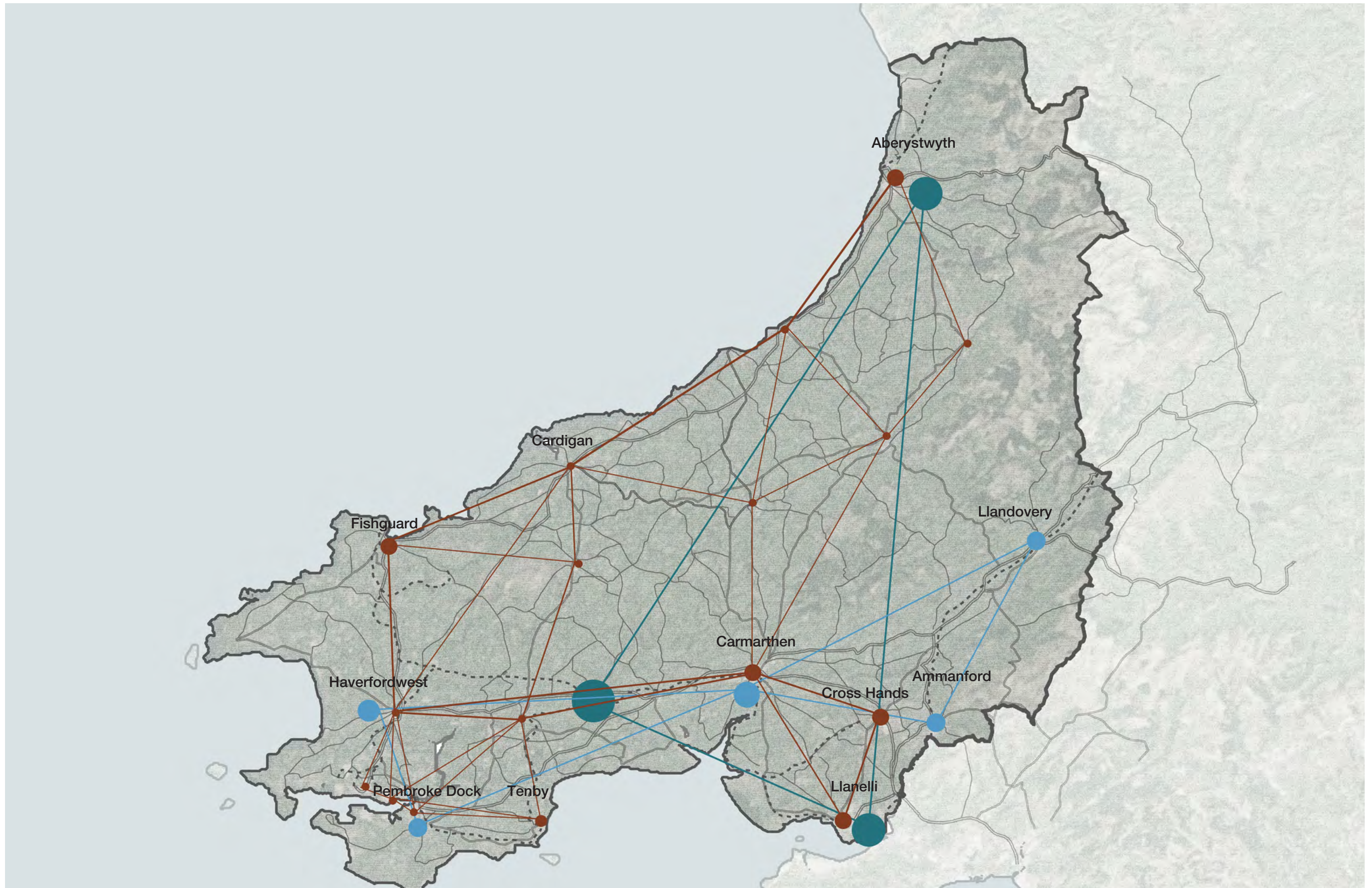
‘Minimum efficiency scenario’ where Services are transformed to align with the AHMWW strategy based on pessimistic design assumptions.

This scenario assumes a higher number of retained beds with increased retention of beds on the community sites and minimum numbers transferred to the new Urgent & Planned Care Hospital. This scenario also assumes the retention of day surgery at both Glangwili and Withybush.

‘Likely efficiency scenario’ where services are transformed to align with the AHMWW strategy based on a “most likely” set of design assumptions to determine a reduction in bed requirements generally with a higher proportion transferred to the Urgent & Planned Care Hospital and a reduction in bed numbers on the other hospital sites.

‘Maximum efficiency scenario’ where Services are transformed to align with the AHMWW strategy with more ambitious design assumptions applied. The scenario minimises the requirement for beds at the Urgent & Planned Care Hospital and on the associated community sites.

The impact of the various efficiency scenarios on the Withybush site is considered in more detail on the following pages.



Proposal B: Network of proposed acute and community sites

4.1 Summary of Estate Development Options

In the future the Withybush Hospital site will operate as a community hospital. Beds will be therapy and nurse led, focusing on rehabilitation and less acute needs (step up from the community /step down from the acute hospital). There will be access to diagnostics and general outpatient clinics with more specialist assessments taking place at the Urgent and Planned Care Hospital.

A summary of the key functional content as described in the high level service brief is as follows;

- 24/7 GP led urgent care centre;
- Therapy and nurse led step up and step-down beds (less critical needs or rehabilitation);
- Outpatient clinics and specialist ambulatory ‘hot’ clinics;
- Facilities for an identified range of day case procedures;
- Midwife led units;
- Access to diagnostic support (x-ray, ultrasound, mammography);
- Renal Dialysis and Chemotherapy.

The service narratives and schedules of accommodation which have been developed to support the programme business case describe the proposed operational and spatial requirements in further detail. Some key elements of the brief are as follows;

- Providing facilities which support the Health Boards vision to be safe, accessible, sustainable and kind
- Achieving design standards set out in Welsh Health Building Notes and Welsh Health Technical Memoranda.
- Protecting patient privacy and dignity
- Supporting efficient flows
- Providing appropriate and logically placed support facilities for staff and patients (zonal hubs)
- Ensuring facilities are both accessible and inclusive
- Maximising the potential for flexibility and future adaptation.

Although the above summary describes the key functional content proposed for the Withybush site in the future, the Minimum, Likely and Maximum service transformation scenarios describe slight differences in the level of service provision.

For example, the minimum service transformation scenario assumes the retention of four 24-bed inpatient wards on the site along with two day-theatres and an endoscopy suite. To support this model a sterile service unit and pathology department will also be retained on the site.

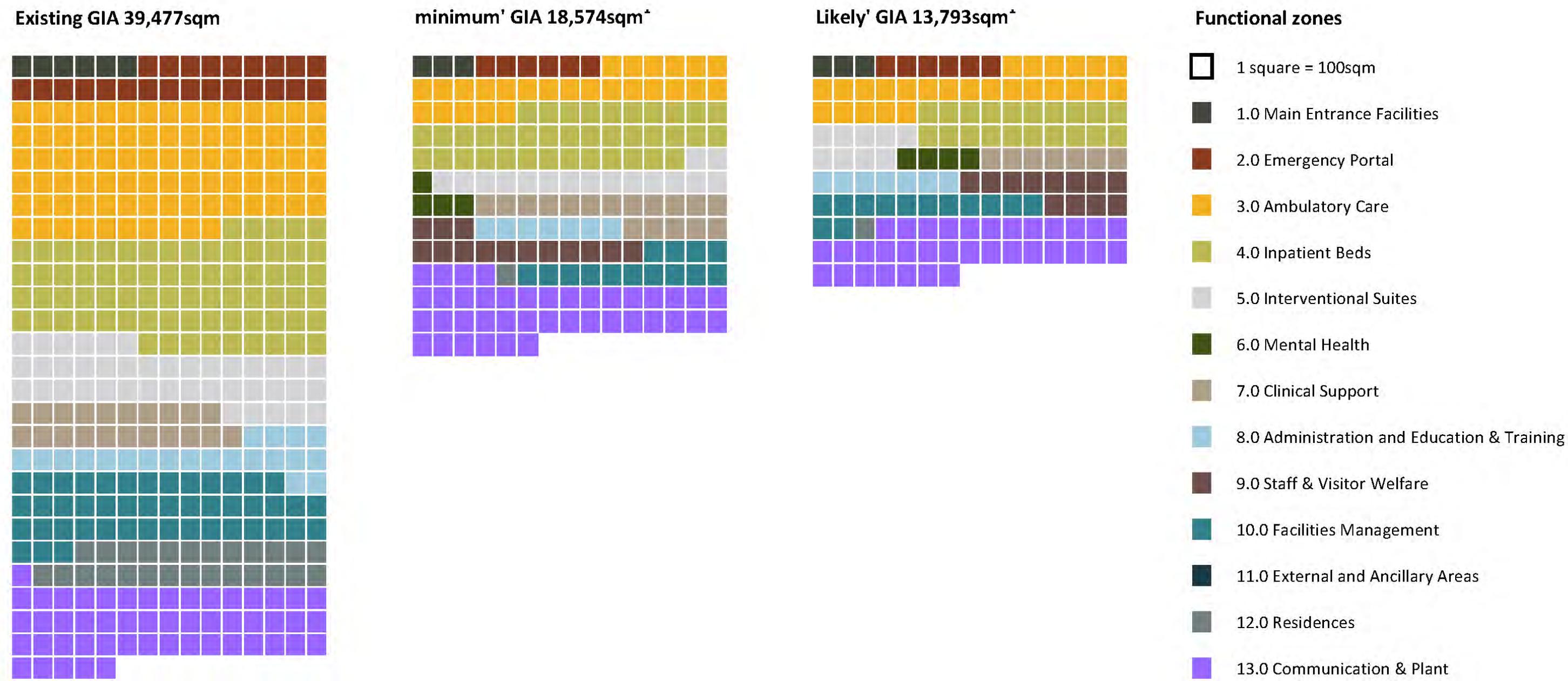
The likely scenario assumes a reduction to two 24-bed inpatient wards on the Withybush site with all day surgery activity relocated to the new Urgent and Planned Care centre along with a subsequent reduction in clinical support spaces.

The maximum service transformation scenario assumes the same level of service provision as for the likely scenario.

The potential impact on the estate footprint at Withybush is significant with a reduction in required area of between 50% and 65% based on schedule of accommodation version 2.2. This offers the potential to either reduce the estate footprint or to collocate other functions in the future such as community health & wellbeing facilities, mental health services or accommodation for partner organisations such as the Local Authority or third sector groups.

For each of the service transformation scenarios at the Withybush site the Programme Business Case considers options for either refurbishment of the existing estate or a new purpose built facility on the site. The estate options have different implications in terms of cost, implementation programmes and compliance.

The range of estate solutions are described in greater detail on the following pages.



1. Existing areas based on 2021 EFPMS data
2. Proposed areas based on SHP schedule of areas dated 06/10/21
3. Comparison of functional zone areas in existing is approximate

4.2 Minimum Scenario: Project 3a

Project 3a is based on a refurbished solution at the existing Withybush site

The minimum transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The minimum scenario also includes four 24-bed inpatient wards, two day theatres and an endoscopy suite. Different to the other scenarios on the Withybush site this option also includes a sterile services unit and pathology suite.

The total briefed area for this option is 18,574sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

The solution is based on the retention of circa 17,450sqm of the existing estate, namely blocks 2, 3, 4 and 5 which form the core of the original hospital built in the 1970's. This includes 2,900sqm on the lower ground floor and 4,850sqm on the ground, first and second floors. A new plantroom of circa 1,000sqm will be required at rooftop level.

The ground floor includes a mix of minor injuries, mental health, ambulatory care and clinical support. The first floor houses the balance of ambulatory care, and two 24-bed inpatient wards. The second floor two 24-bed wards and intervention suites. The lower ground floor includes FM services and some plant space.

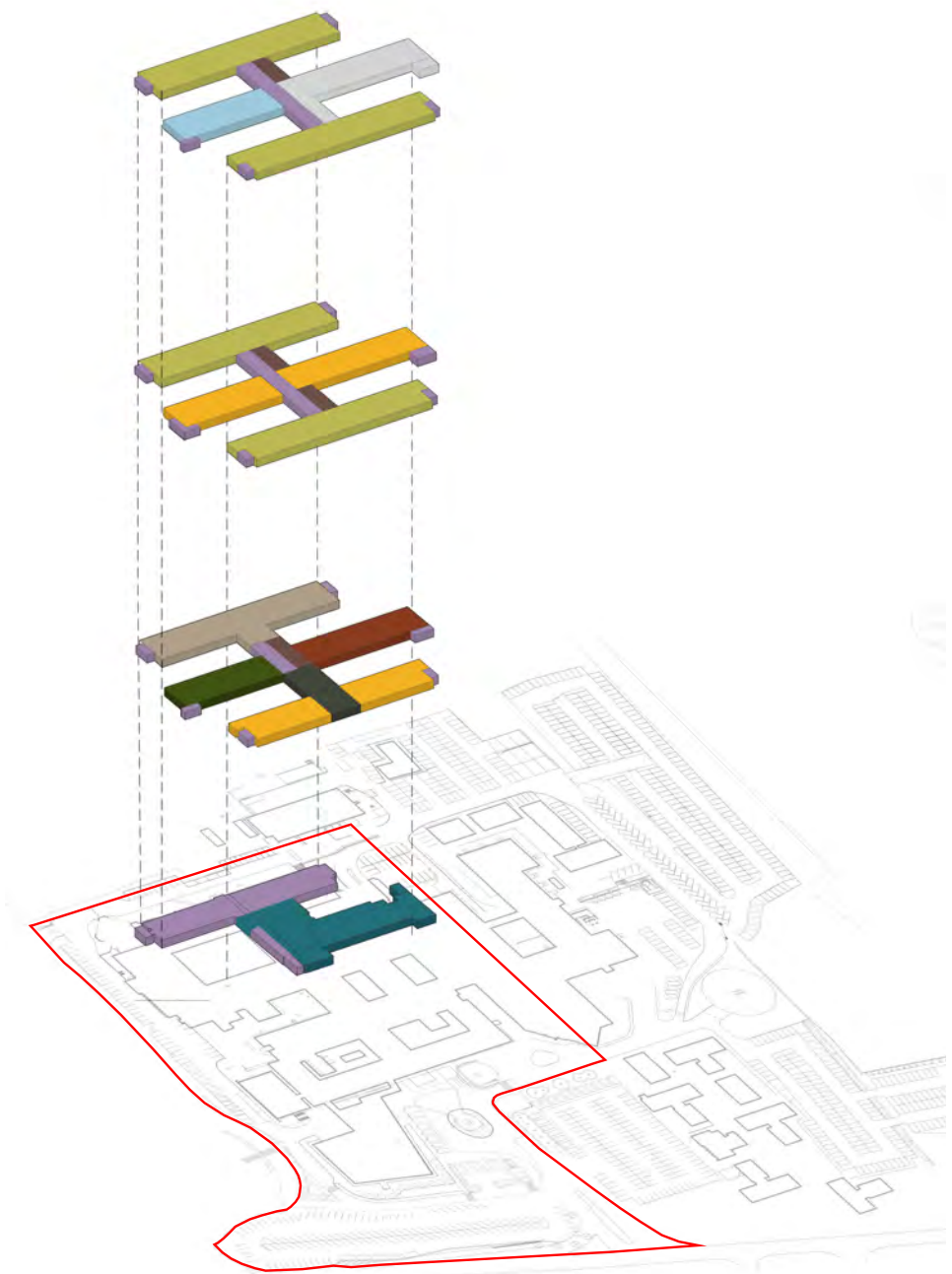
The retained buildings provide slightly more space than required by the brief but this ensures the potential for full Health Building Note compliance in terms of space standards and spatial relationships.

The condition of the existing blocks is poor and therefore this option assumes that the buildings will be stripped back to the original frame with new external cladding, internal fabric and full replacement of the engineering infrastructure. The viability of this solution will need to be tested further at the Outline Business Case stage

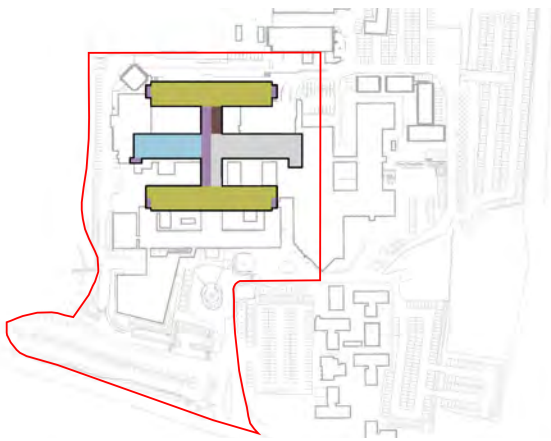
Based on the size of the existing estate and the proposed retained area there is the potential for this project to be delivered in a single phase without the need for additional decant space, with functions relocated away from blocks 2, 3, 4 and 5 during the construction stage. This solution will require some temporary engineering infrastructure to allow the retained estate to remain operational during the refurbishment works.

This project can only be delivered following the opening of the new Urgent & Planned Care Centre and the relocation of services away from the Withybush site.

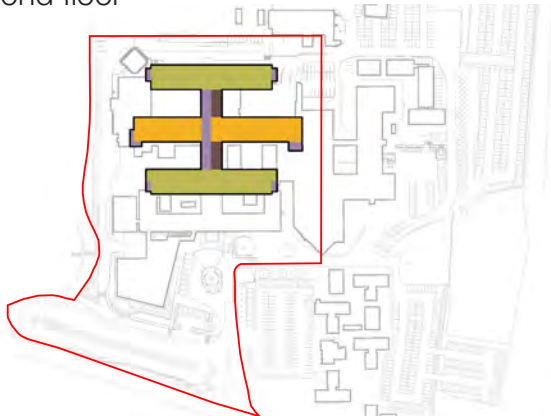
On completion the remainder of the unused estate will need to be demolished and this will include parts of the site which were built within the last 10 years. With a reduction in the building footprint and less car-parking required there is the potential to dispose of circa 6-7 acres in the future.



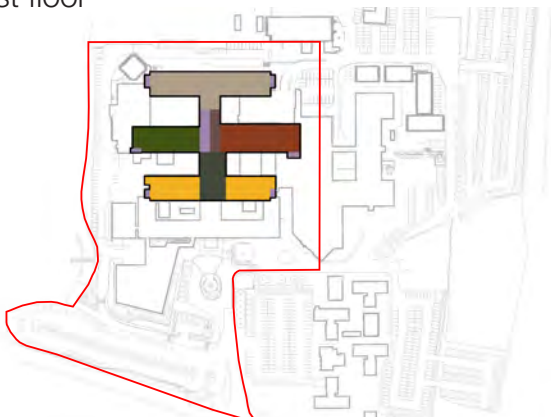
Project 3a stacking diagram



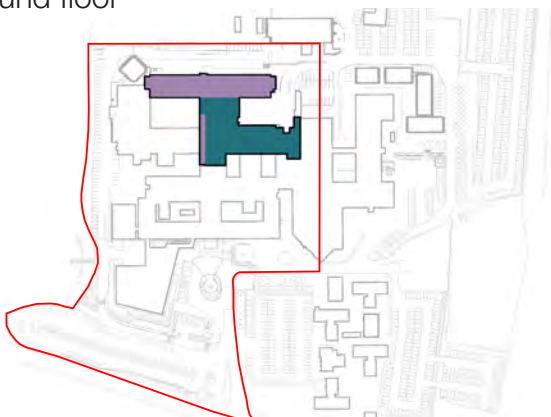
Project 3a second floor



Project 3a first floor



Project 3a ground floor



Project 3a lower ground floor

4.3 Minimum Scenario: Project 3b

Project 3b is based on a new build solution on the existing Withybush site.

The minimum transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The minimum scenario also includes four 24-bed inpatient wards, two day theatres and an endoscopy suite. Different to the other scenarios this option also includes a sterile services unit and pathology suite.

The total briefed area for this option is 18,574sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

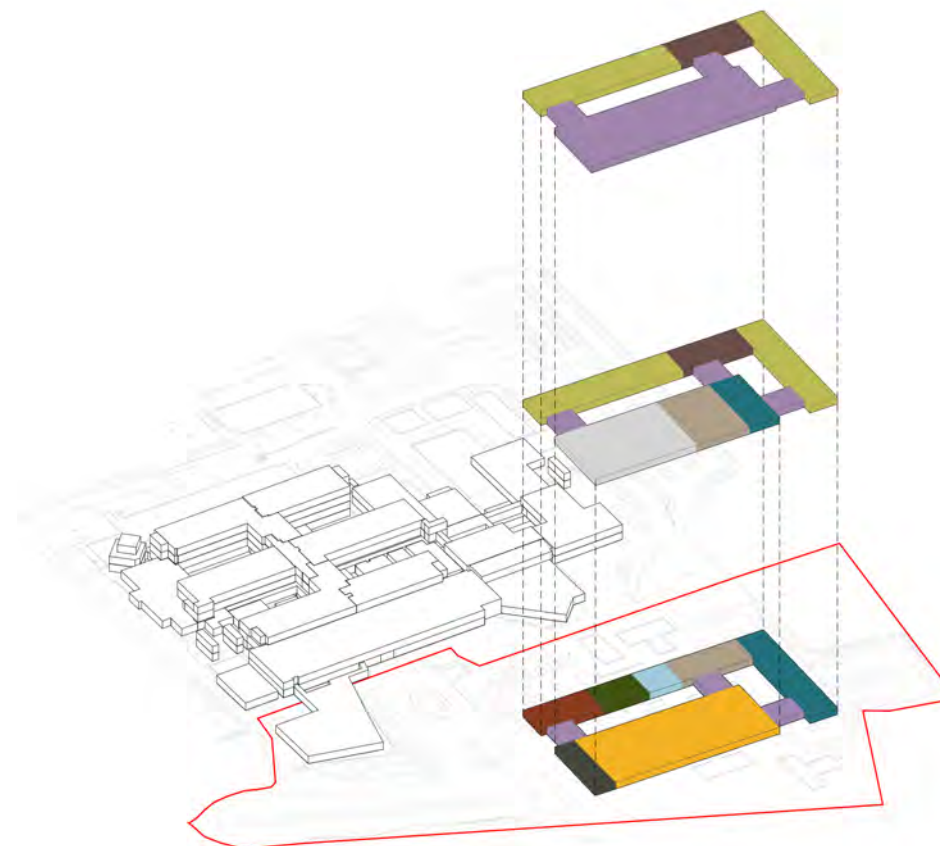
The solution suggests a 3-storey building located on the site of the existing residential blocks which will be vacated and demolished prior to commencing construction work. The proposed ground floor footprint is circa 6,500sqm.

The larger central block includes the main entrance and ambulatory care functions on the ground floor, with the intervention suites clinical support and FM space on the first floor. The narrow plan block includes the minor injuries unit, mental health, offices support and FM accommodation on the ground floor and two 24-bed wards with welfare accommodation on both the first and second floors. Engineering plant will be located on the top floor of the main clinical block

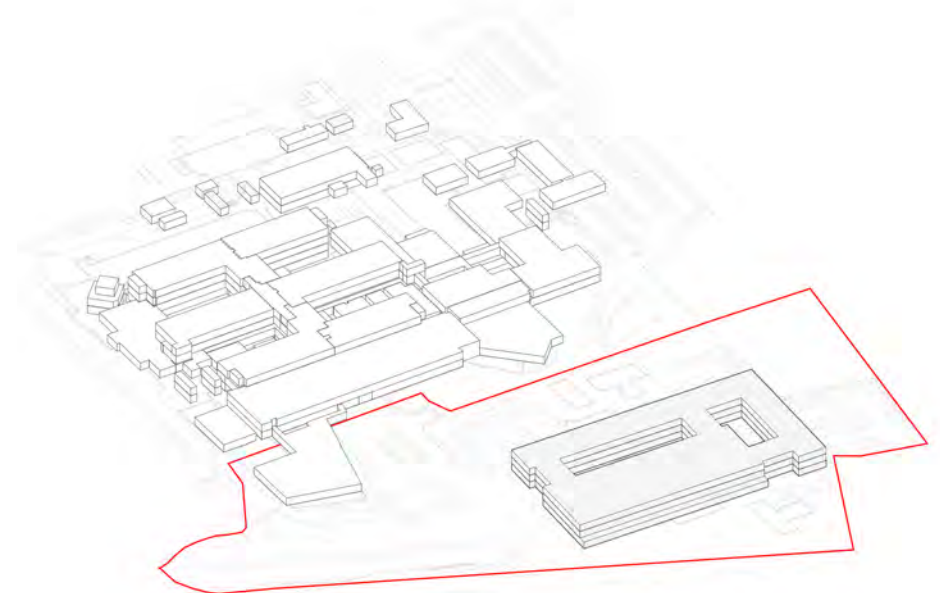
There are known challenges with developing this part of the site with ground conditions requiring particular attention, however if sited appropriately the project could be delivered while the existing hospital remains live. Project 3b can be delivered independently of the wider estate upgrades including the new Urgent & Planned Care Centre.

The existing hospital access on Fishguard Road can be retained for the new development avoiding the need for disruptive highways works. The existing car park adjacent to the main entrance can be retained but will likely require some reconfiguration and additional landscaping.

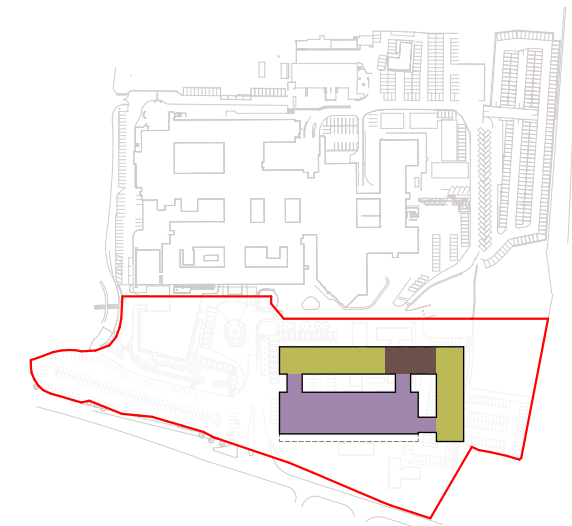
The suggested site area for the new hospital is approximately 7 acres and on completion the remainder of the site can be disposed of with a potential site access from the adjacent retail park to the South.



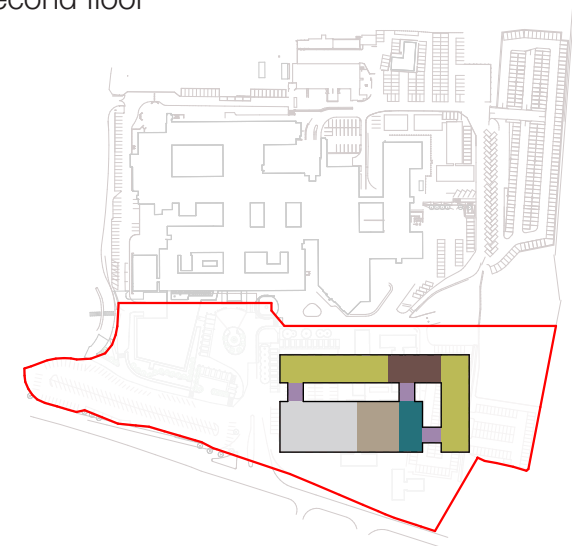
Project 3b stacking diagram



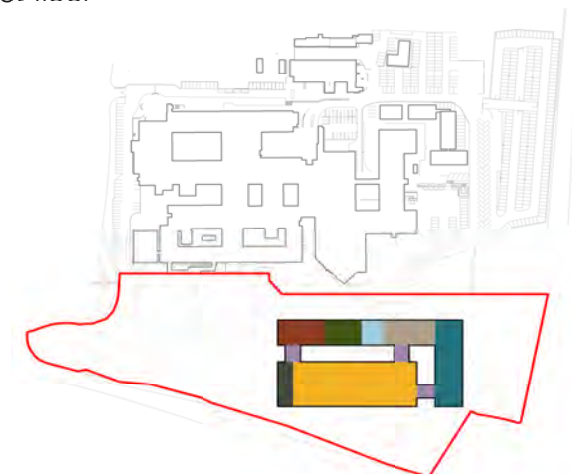
Project 3b massing study



Project 3b second floor



Project 3b first floor



Project 3b ground floor

4.4 Likely Scenario: Project 3c

Project 3c is based on a refurbished solution at the existing Withybush site

The likely transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The likely scenario also includes two 24-bed inpatient wards.

The total briefed area for this option is 13,793sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

The solution is based on the retention of circa 17,450sqm of the existing estate, namely blocks 2, 3, 4 and 5 which form the core of the original hospital built in the 1970's. This includes 2,900sqm on the lower ground floor and 4,850sqm on the ground, first and second floors.

The ground floor includes a mix of minor injuries, mental health, ambulatory care and FM services. The first floor houses the balance of ambulatory care, intervention suites and some welfare accommodation. The second floor two 24-bed wards admin and education space. The lower ground floor includes new engineering plant space.

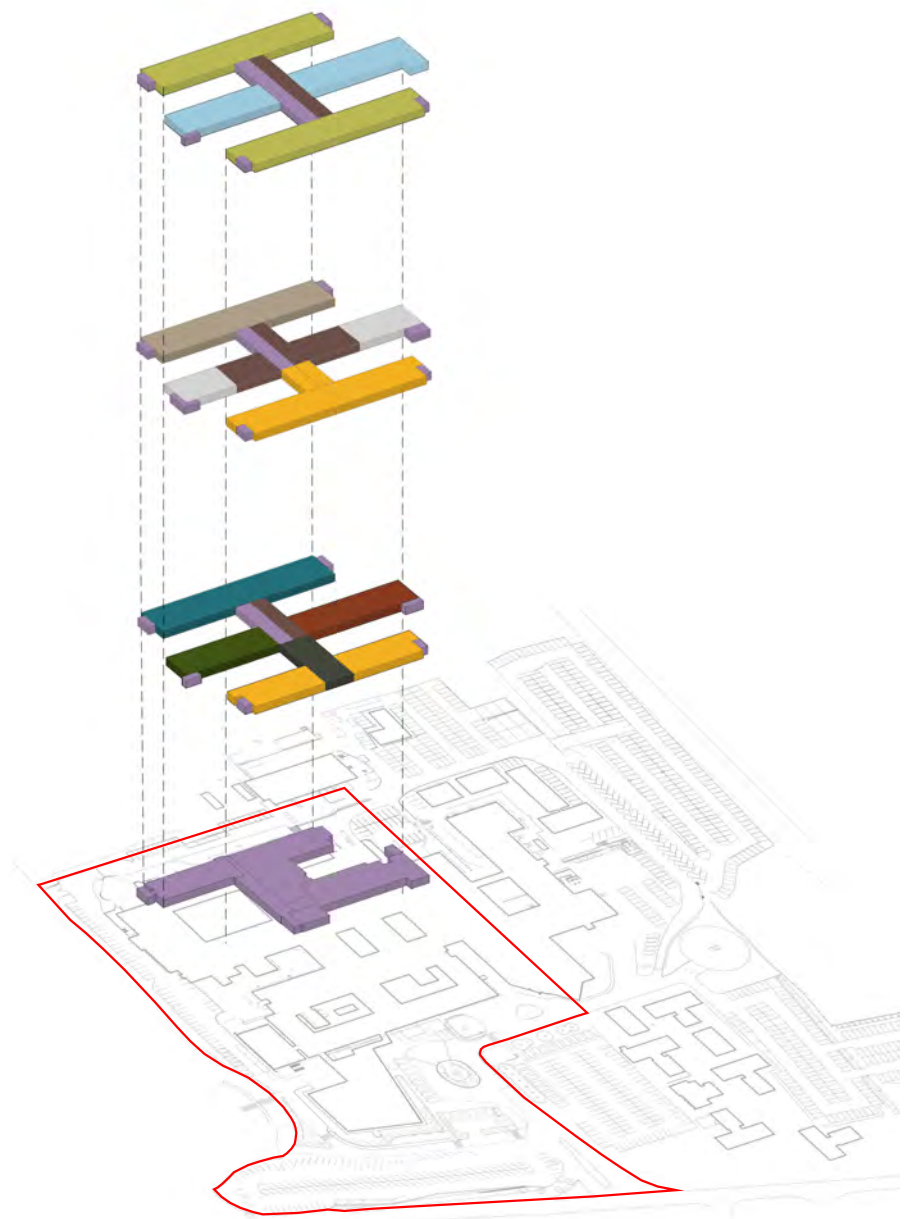
The retained buildings provide significantly more space than required by the brief, but this ensures the potential for full Health Building Note compliance in terms of space standards and spatial relationships, and provides some flexibility for future expansion.

The condition of the existing blocks is poor and therefore this option assumes that the buildings will be stripped back to the original frame with new external cladding, internal fabric and full replacement of the engineering infrastructure. The viability of this solution will need to be tested further at the Outline Business Case stage

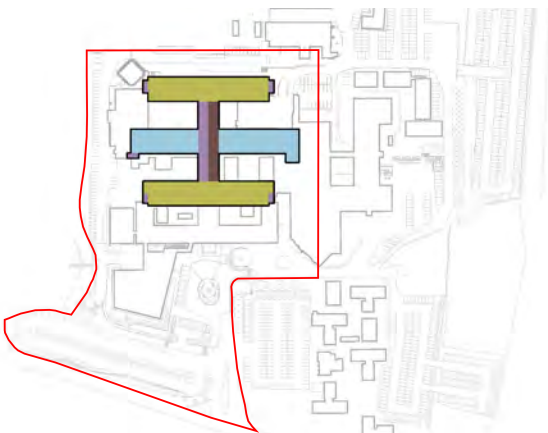
Based on the size of the existing estate and the proposed retained area there is the potential for this project to be delivered in a single phase without the need for additional decant space, with functions relocated away from blocks 2, 3, 4 and 5 during the construction stage. This solution will require some temporary engineering infrastructure to allow the retained estate to remain operational during the refurbishment works.

This project can only be delivered following the opening of the new Urgent & Planned Care Centre and the relocation of services away from the Withybush site.

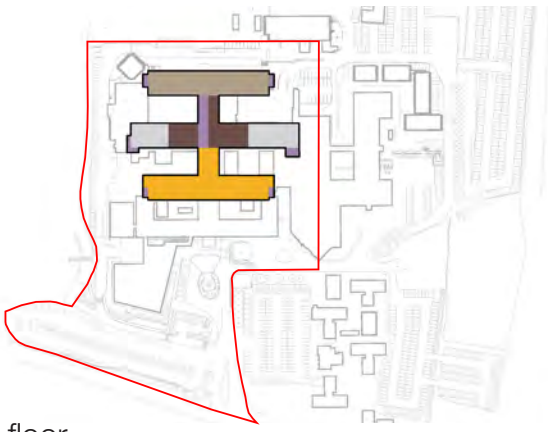
On completion the remainder of the unused estate will need to be demolished and this will include parts of the site which were built within the last 10 years. With a reduction in the building footprint and less car-parking required there is the potential to dispose of circa 6-7 acres in the future.



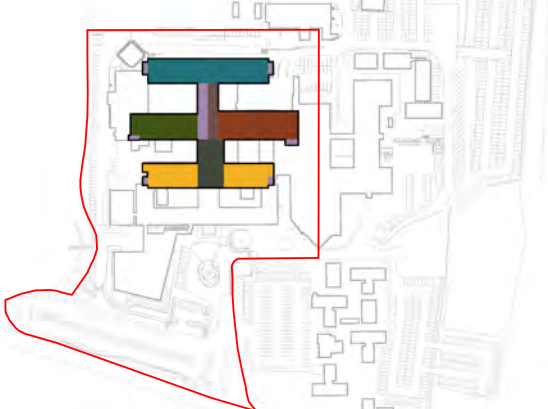
Project 3c stacking diagram



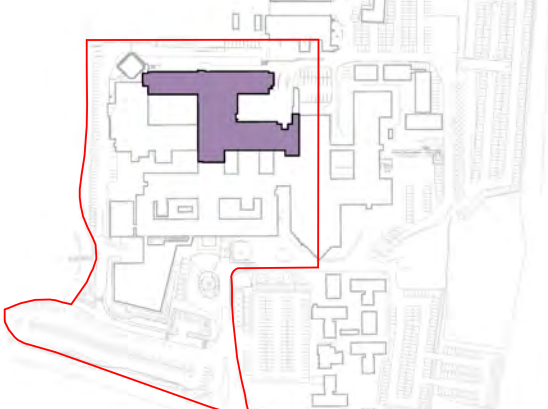
Project 3c second floor



Project 3c first floor



Project 3c ground floor



Project 3c lower ground floor

4.5 Minimum Scenario: Project 3d

Project 3d is based on a new build solution on the existing Withybush site

The likely transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The likely scenario also includes two 24-bed inpatient wards.

The total briefed area for this option is 13,793sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

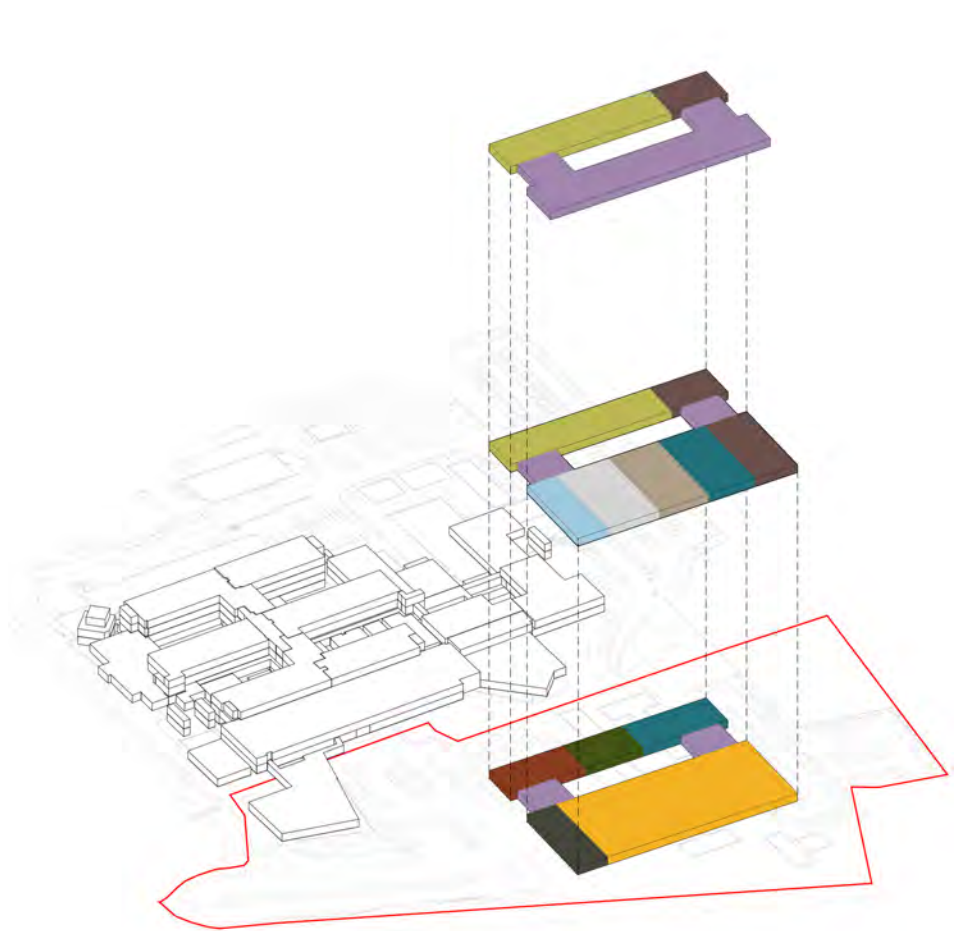
The solution suggests a 3-storey building located on the site of the existing residential blocks which will be vacated and demolished prior to commencing construction work. The proposed ground floor footprint is circa 5,000sqm.

The larger block includes the main entrance and ambulatory care functions on the ground floor, with the intervention suites, offices, clinical support and FM space on the first floor. The narrow plan block includes the minor injuries unit, mental health and FM accommodation on the ground floor and a 24-bed ward with welfare accommodation the first and second floors. Engineering plant will be located on the second floor of the main clinical block

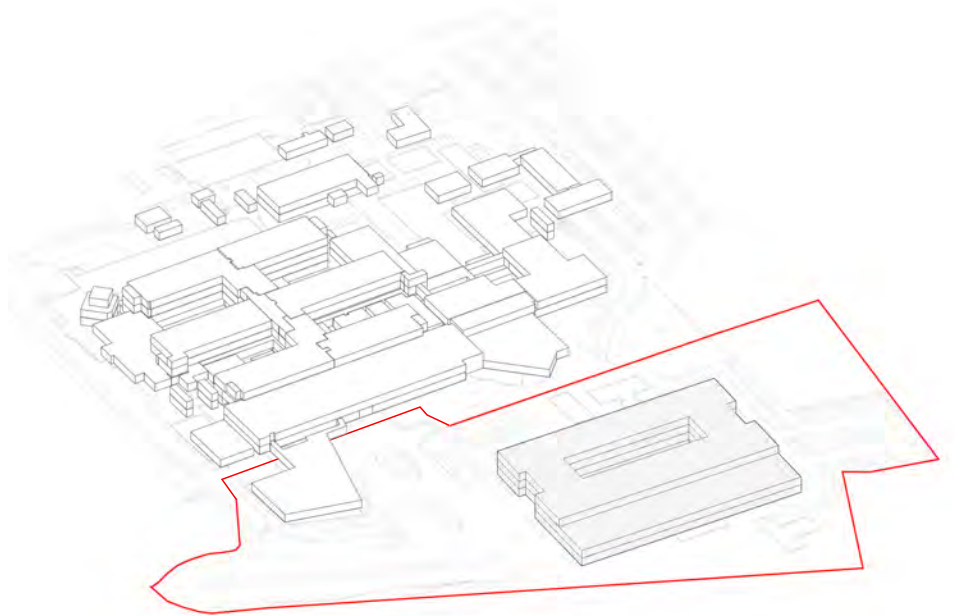
There are known challenges with developing this part of the site with ground conditions requiring particular attention, however if sited appropriately the project could be delivered while the existing hospital remains live. Project 3d can be delivered independently of the wider estate upgrades including the new Urgent & Planned Care Centre.

The existing hospital access on Fishguard Road can be retained for the new development avoiding the need for disruptive highways works. The existing car park adjacent to the main entrance can be retained but will likely require some reconfiguration and additional landscaping.

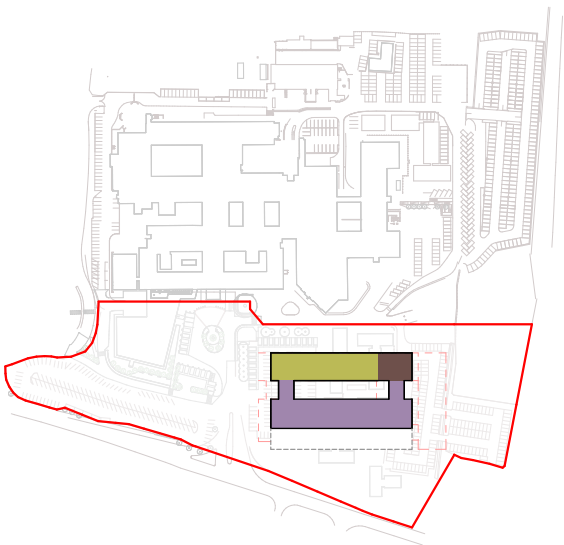
The suggested site area for the new hospital is approximately 7 acres and on completion the remainder of the site can be disposed- of with a potential site access from the adjacent retail park to the South.



Project 3d stacking diagram



Project 3d massing study



Project 3d second floor



Project 3d first floor



Project 3d ground floor

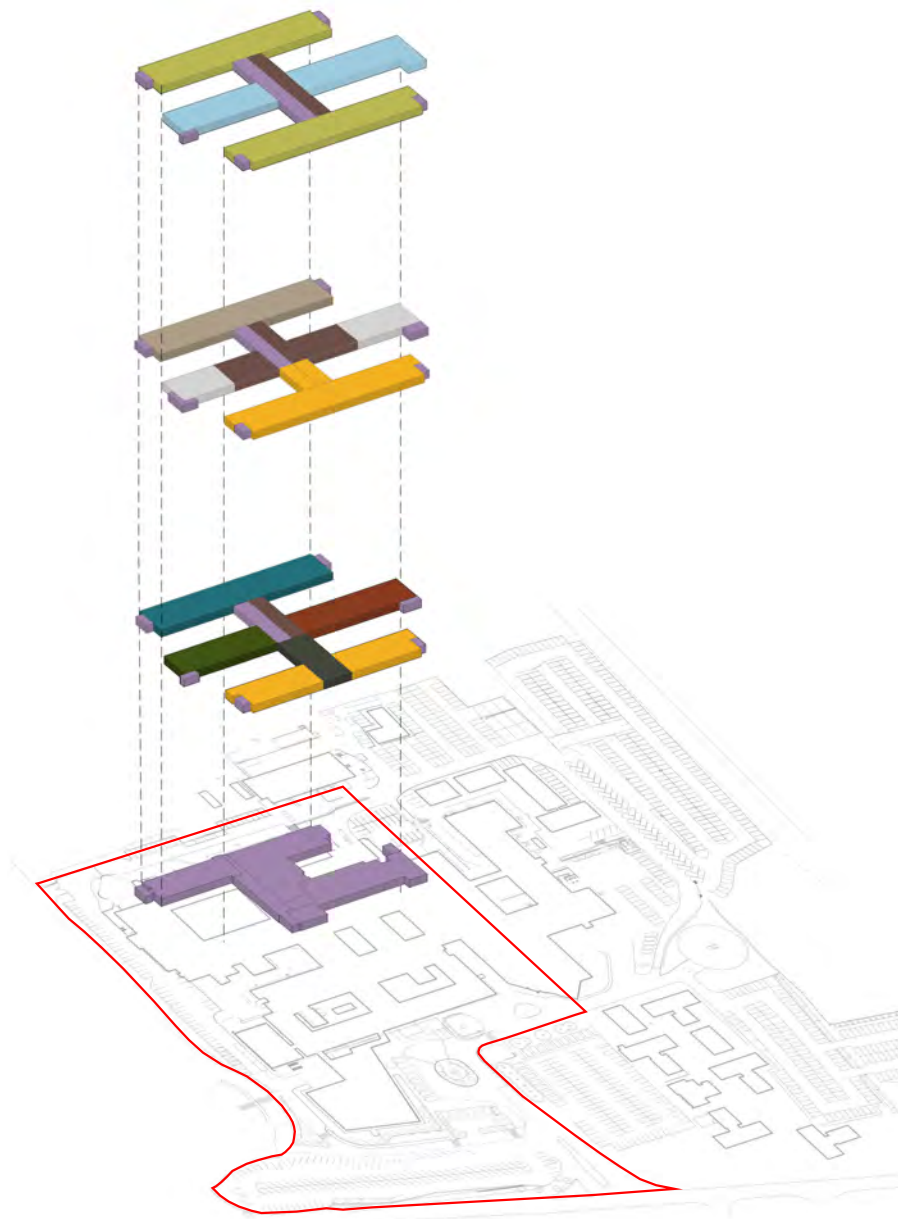
4.6 Maximum Scenario: Project 3e

Project 3e is based on a refurbished solution at the existing Withybush site

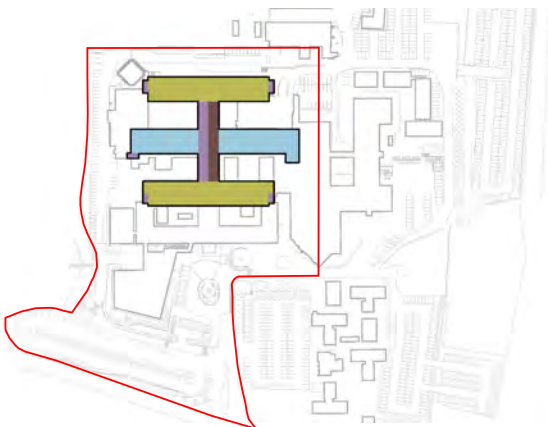
The maximum transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The maximum scenario also includes two 24-bed inpatient wards.

The total briefed area for this option is 13,793sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

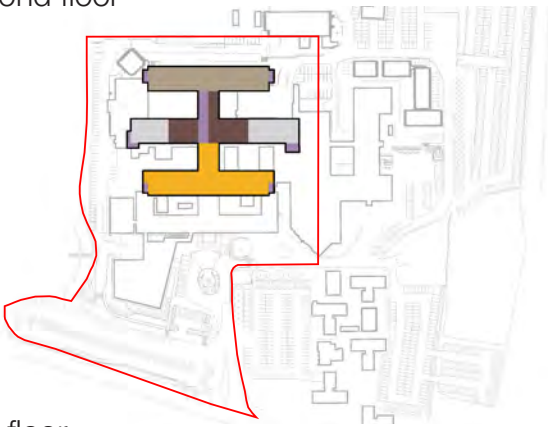
The solution for the maximum transformation refurbished option is identical to the likely option described on the previous pages.



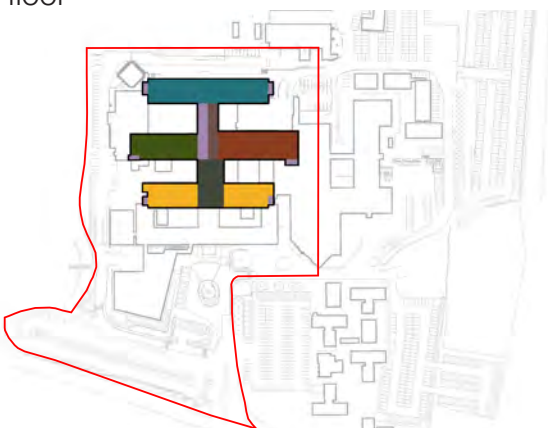
Project 3e stacking diagram



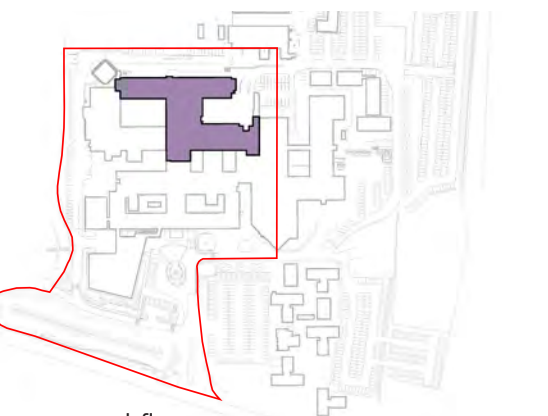
Project 3e second floor



Project 3e first floor



Project 3e ground floor



Project 3e lower ground floor

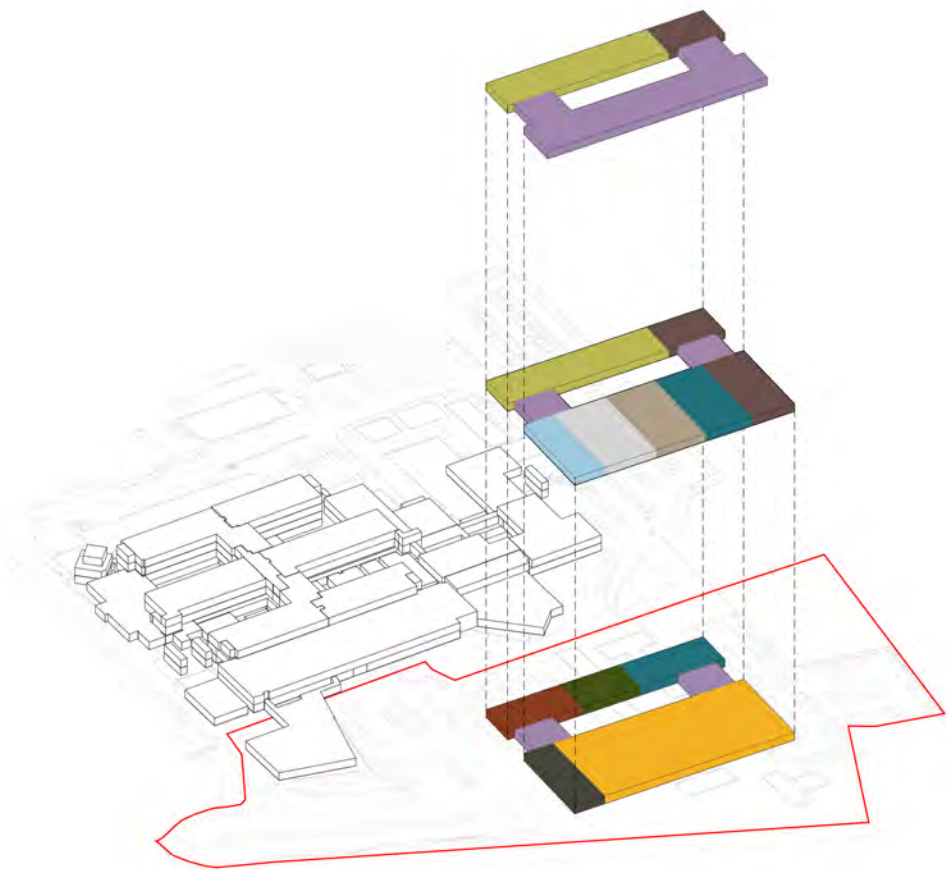
4.7 Maximum Scenario: Project 3f

Project 3f is based on a new build solution on the existing Withybush site

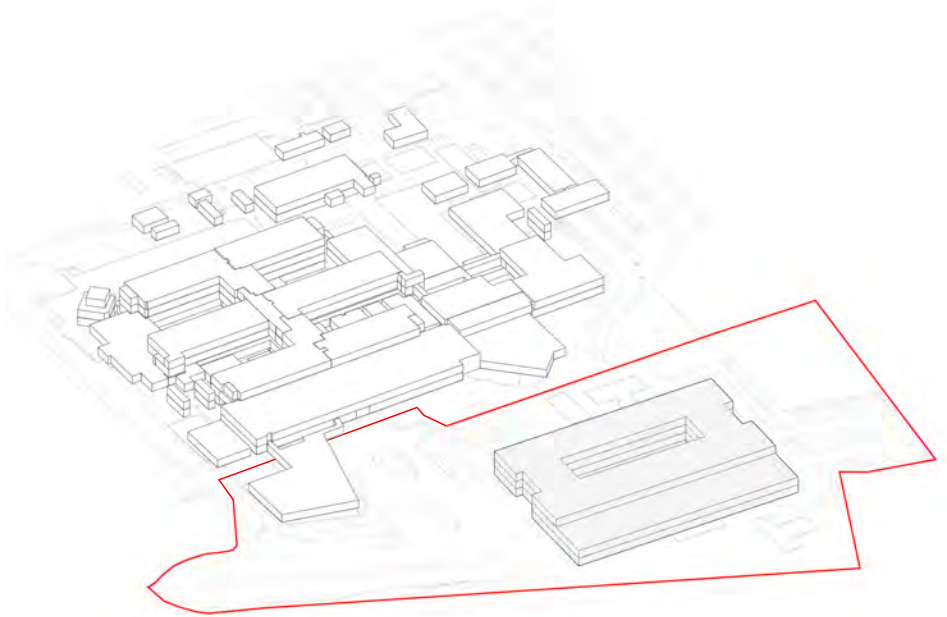
The maximum transformation scenario describes a functional requirement at Withybush which includes a minor injuries unit with GP out of hours service and satellite imaging, four outpatient clusters and 16 renal treatment chairs. The maximum scenario also includes two 24-bed inpatient wards.

The total briefed area for this option is 13,793sqm which includes allowances of 11% and 12% for communication space and plant space accordingly.

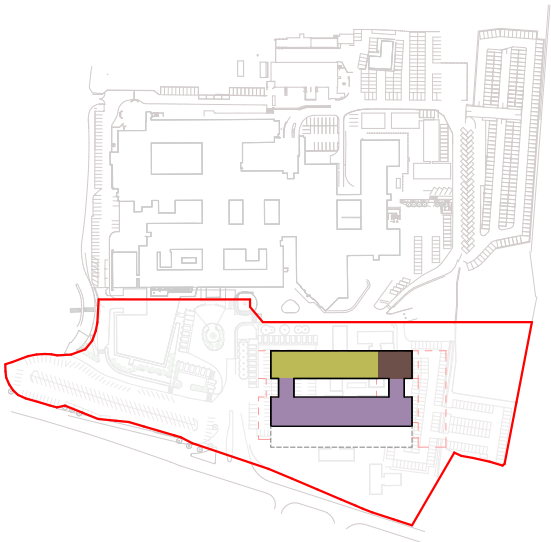
The solution for the maximum transformation new build option is identical to the likely option described on the previous pages.



Project 3f stacking diagram



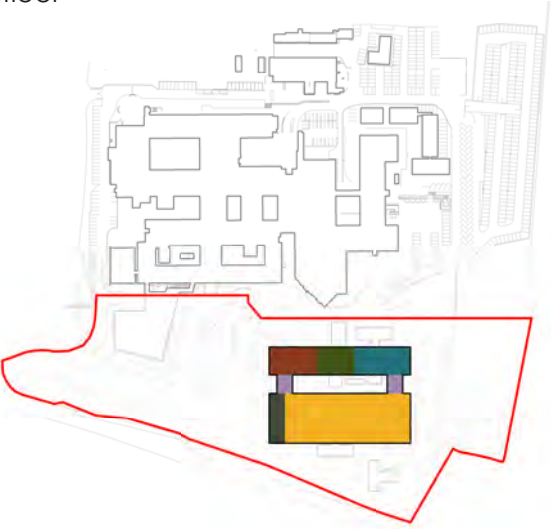
Project 3f massing study



Project 3f second floor



Project 3f first floor



Project 3f ground floor

5.1 Engineering Infrastructure

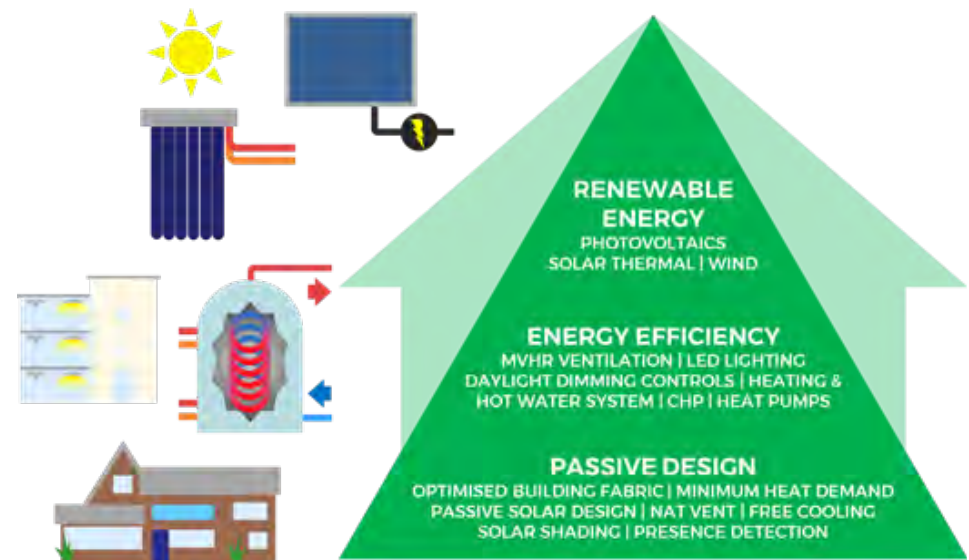
As noted in the minimum, maximum and likely scenarios, all services within the buildings will be being removed and replaced as buildings are either being taking back to the structure or new buildings are being provided. As previously noted in section 2 the existing infrastructure for the site is past its design life and due for renewal. We would suggest that this should be replaced as part of these works. Providing new infrastructure to the retained buildings, allowing the existing infrastructure to be removed on decommissioning of the remaining site.

In doing so, the estate can incorporate decarbonisation and ensure that the current WHTMs and WHBNs are incorporated. Fire compliance and appropriate sprinkler coverage can also be ensured as part of these works.

It should be noted that where existing structures are retained, there is likely to be challenges regarding mechanical ventilation of these spaces in accordance with the latest guidance. The existing buildings are mostly naturally ventilated and the original floor to floor heights and service voids do not take into account the ductwork requirements. Additionally, there is no allowance for the associated air handling units to be located in roof plant rooms. This will require careful consideration during any refurbishment works.

As part of these works, we would assume that the existing gas infrastructure would become redundant with the move to an all electric site in line with current decarbonisation plans. We would currently envisage a move to electric heat pumps (either ground or air sourced) linked to a district network serving the buildings.

The move to electricity as the primary fuel source for heating will increase the load on the incoming electrical supply. Further work will need to be undertaken to determine if the reduction in estate buildings and improvements in the electrical efficiency offsets the additional load or if more primary electrical infrastructure is required. The existing electrical supply arrangement will be reviewed against WHTM benchmarks to check that it provides the appropriate level of resilience.



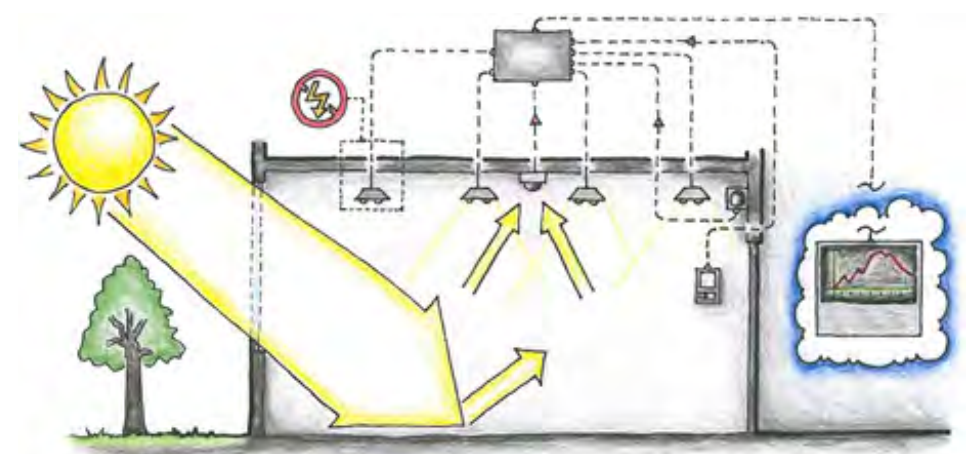
Incoming telecommunications will be reviewed for their suitability for continued use.

In the “do nothing” scenario, it should be noted that work will still need to be undertaken on the services to maintain the operation of the building. Significant amount of plant and services are at the end of their design life and due for renewal. Fire compliance work would also need to be undertaken to ensure that the building is meeting all statutory requirements.

Generator back up of the electrical power will need to be provided to provide the appropriate level of resilience to the electrical system.

New and refurbished buildings would look to minimise heat loss by maximising the thermal performance of the buildings. This will assist in reducing the energy requirements.

New buildings would also incorporate photovoltaic panels (PVs) to offset energy use.



5.2 Engineering Infrastructure

External works

The internal road network, visitor and staff car parks are macadam surfaced and generally in fair condition, and whilst minor repairs are required, it is likely that existing roads and car parking will be utilised where possible (perhaps surfaced) within all re-development options.

Civil & Structural engineering: Topography & Geology

Withybush Hospital is positioned generally on relatively flat land and therefore whilst some earthworks will be required to form the floor-plate of new build options 3b & 3d, it is not envisaged to be significant.

Civil & Structural engineering: Flood Risk

The Natural Resources Wales plan shows the site to be within Flood Zone 1 which indicates a low risk of flooding from rivers or tidal waters. Surface water flooding will be managed through the drainage design for each of the redevelopment options.

Civil & Structural engineering: Below ground drainage

Surface Water Drainage

Common impacts for Options 3a, 3b, 3c & 3d

All options include demolition of existing elements of the site and in this case there may be the need for some some reconstruction/realignment/protection of the existing drainage systems. The management of surface water runoff, both in terms of quantum and quality, would need to be considered in a holist manner such that flood risk is not exacerbated.

Impacts for Options 3b & 3d

The refurb will be internal and therefore changes to the Surface water drainage system are not necessarily required.

Impacts for Options 3b & 3d

The new build options will come with the requirement for SuDS design principles in accordance with Welsh Government's Statutory Standards. This will generate the need for surface water treatment & attenuation prior to its discharge to either ground or as per the status quo via the land drainage system.

Foul Drainage

Common impacts for Options 3a, 3b, 3c & 3d

All options result in a reduction in foul flows discharging to the foul water drainage system and therefore whilst there may be some reconstruction/realignment/protection of the existing drainage systems, which would be done as part of the demolition works, no enhancement would be required.

Additional Impacts for Options 3a & 3c

The refurb options will come with the likely requirement to carry out works to extend the lifetime of the existing foul pumping station at the rear of the site

Additional Impacts for Options 3b & 3d

The new build options will provide the opportunity to decommission the existing foul pumping station at the rear of the site and potentially re-connect to the public sewer in the adjacent highway with a gravity connection, or alternatively a new pumping station and rising main.

6.1 Implementation Strategy

High Level Implementation Strategy for Withybush

The preferred way forward is to provide a new build solution to provide the new Community Hospital at Withybush. Construction of the new Community Hospital is planned to be completed at the same time as the proposed Urgent and Planned Care Hospital enabling both to open around the same time maximising the ability to shift to the new model of care.

This approach provides a period of around 14 months for enabling works such as localised demolitions infrastructure alterations and service diversions to be undertaken to create the development zone for the new build development. This is dependent on creating sufficient space to allow the development whilst maintaining current services on the Withybush site during construction.

The development zone for the new build solution utilises the existing public car parks toward the front of the site. This will require alternative parking solutions together with reconfiguration of the sites existing road infrastructure.

Site clearance works will also be required to demolish all of the existing residences (the majority of which are office accommodation) and decommissioning of the existing helipad (currently not used).

Whilst not essential the existing renal unit would also be demolished although could be retained form alternative use e.g. the proposed integrated care centre or similar.

Solutions for these and any decant accommodation will be developed further during the outline business case stage.

A summary table of key milestones for a new build solution is included below:

Milestone	WGH (new build)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW framework)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Period of site preparatory/demolitions/ enabling works	July 2026 – July 2027
Start on site	August 2026
Construction Completion	End June 2029
Commissioning	July – October 2029
Opening	End October 2029
Disposal of surplus site area	2030

*Table based upon Implementation Option No. 1

Whilst a new build solution is the preferred way forward to develop the new Community Hospital a part refurbishment and new build solution has also been considered. Whilst this seems feasible such a development could not commence until the new Urgent and Planned Care Hospital is operational.

This approach provides a period of over 3 years for enabling works such as localised demolitions infrastructure alterations and service diversions to be undertaken to prepare the site for repurposing and a phased redevelopment.

Detailed sequencing of works has not been considered at this stage although the high-level assumption is that those services remaining at Withybush would be provided within areas of accommodation planned for demolition and the front part of the main block, whilst the remainder of the existing main hospital is completely repurposed. Once phase 1 is completed clinical services would move into the new repurposed accommodation allowing the remainder of the retained accommodation to be repurposed.

Following completion, the surplus accommodation across the site would be demolished allowing potential disposal of the existing site once car parking and landscaping works had been completed.

Alternatively, the surplus areas of the existing hospital site could be redeveloped for health related and other community uses.

Milestone	WGH (refurb)
PBC Submission	End January 2022
PBC Endorsed (for purposes of progression)	March-May 2022
OBC team selected (BfW framework)	May – July 2022
Outline Planning Application	Dec 2023
OBC Submission	End January 2024
Outline Planning Approval	End May 2024
OBC Approval (WG)	Mid July 2024
Reserved Matters Discharged (Planning)	By September 2025
FBC Submission	Mid March 2026
FBC Approval (WG)	Early June 2026
Period of site preparatory/demolitions/ enabling works	July 2026 – end 2029
Start on site	January 2030
Construction Completion	August 2034
Commissioning	September and October 2034
Overall Opening and site completion	End 2034
Disposal of surplus site area	2035 onwards

*Table based upon Implementation Option No.'s 7 & 8

7.1 Planning

The hospital is located within the administrative area of Pembrokeshire County Council. The statutory development plan for the hospital site comprises the Local Development Plan (LDP) for Pembrokeshire (Adopted 2013).

The first Review of Pembrokeshire County Council's LDP commenced on 5 May 2017. The revised LDP is currently at the Deposit stage. The Delivery Agreement states that the revised LDP will be adopted in Summer 2022.

Local Planning Policy

The adopted Local Plan policies which are particularly relevant to the site are summarised below.

GN.2 Sustainable Design

The policy states that development will be approved where "It is of a good design which pays due regard to local distinctiveness and contributes positively to the local context", amongst other criteria which seek to deliver more sustainable buildings and places by ensuring that all new development is designed and constructed to meet all relevant policy criteria and with low maintenance implications.

SP 13 Settlement Boundaries

The policy states that "Settlement Boundaries are shown for all settlements and define the areas within which development opportunities may be appropriate".

The settlement boundary follows the western boundary of the hospital site.

Policy GN.33 Community Facilities

The policy states the following:

"A The development of new community facilities will be permitted where proposals are located within or are well related to a settlement.

B Extension(s) to an existing community facility will be permitted where the facility is appropriately located to meet the needs of the community it is to serve."

Part D of the policy identifies that a 2.57ha site is allocated for a hospital extension to Withybush Hospital under site reference CF/040/02.

The revised LDP would need to be considered prior to its formal adoption but afforded limited-moderate weight depending on how far it has advanced at the point of a planning application.

National Planning Policy

In terms of National Planning Policy, Future Wales: The National Plan 2040, Planning Policy Wales and Technical Advice Notes (TAN) would apply to the site.

Future Wales: The National Plan 2040

Future Wales is the National Development Framework for Wales, setting the direction for development in Wales to 2040. Future Wales is a spatial plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.



Planning Policy Wales

Planning Policy Wales (PPW) Edition 11 (February 2021) outlines the Welsh Governments land use planning policies. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

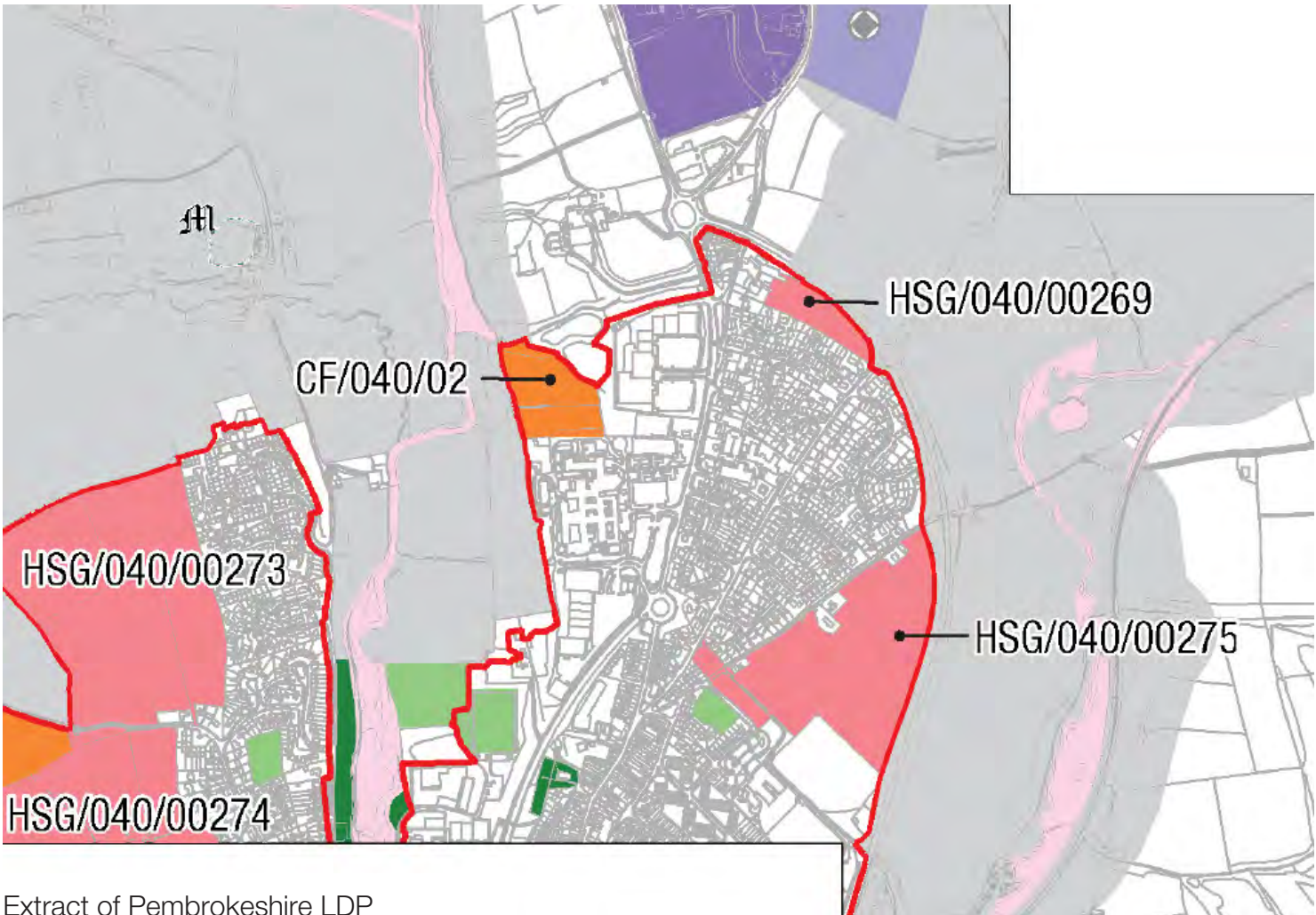
Technical Advice Notes (TANs)

TANs provide detailed planning advice to accompany Future Wales and PPW. In terms of Withybush Hospital, the following TAN would be relevant.

TAN 12 Design

TAN 12 sets out design guidance for developers to adhere to, ensuring that sustainability through good design is promoted within the planning system. Guidance within this note would need to be considered at the design stage, including the production of a Design and Access Statement to accompany the planning application which is a requirement for any ‘major’ development in Wales, this is any development over 1ha.

Paragraph 5.10.1 states that “In the design of schools, hospitals and other buildings and infrastructure intended for use by the local community the aim should be to achieve fitness for purpose, value for money over the whole life of the building, and a positive impact on the lives of those who use it and on its surroundings.”



Extract of Pembrokeshire LDP

8.1 Cost Summary

Works Cost

The Withybush Hospital New Build option comprises a new hospital and the closure of the existing hospital. The costs are based on an elemental cost per m2, and the traditional approach using DCAGs has not been followed. The rationale for this is that the DCAGs database has not been updated for a considerable time, and there have been several significant changes in both healthcare design standards and planning and building regulations requirements which render the DCAGs unreliable.

New Hospital Option

The basis of the elemental cost is the benchmark cost reports for similar schemes and the Grange Hospital elemental analysis, which takes account of a number of additional cost drivers including further regulatory change and design aspiration, as follows:

- BREEAM 2018 in lieu of BREEAM 2014 – addition 0.75%
- Decarbonisation aspirations – addition 3%
- SMART costs – addition 1% (see Non-works costs for impact on IT costs)
- Biophilic Design aspirations – addition 2%
- Location – addition 2%

The percentage additions were derived from various sources and also take account of the area in which the developments will be built.

Refurbishment Option

The basis of the elemental costs for the different types of refurbishment works is benchmark costs, developed using an extensive database of costs, as above. The elemental costs are then adjusted to reflect the scope of the proposed refurbishment works. Major refurbishment is included with the assumption the existing building will be stripped back to the frame and structural repairs to the frame and roof will be required.

External Works (Oncosts)

The new build option establishes an indicative site area to be retained with the residual area available for disposal. An assessment of the external works was calculated, and indicative rates applied. This was compared to an adjusted cost using the ‘How to Cost a Hospital’ methodology to validate the costs included. Demolition

costs are included only for the residences, IT hub, nursery and administration facilities buildings in the area of the new building. The refurbishment option adopts a similar approach as the site layout will change to reflect a smaller building and disposal of surplus land. Costs for diversion of existing services are included. Demolition costs are included to those buildings adjoining the area retained. The costs reflect that some buildings will not be demolished and require making secure prior to disposal. Phasing costs are included to reflect the scope and extended programme of the works.

A benchmark of 18.5% has been included for fees and survey costs. This includes for all principal designers but also the specialist designers such as acoustic and fire engineers, ecology and BREEAM consultants. Specialist advisors for the Health Board including the District Valuer, Vat advisor and audit services are included.

Non-Works Cost

IT Costs: A meeting has been held with the Health Board’s IT lead. The IT budget reflects the SMART hospital aspirations for the future.

An allowance of 1% of the Works Cost has been included for art.

An allowance for other Non-Works costs has been included benchmarked against the Grange Hospital.

Decant accommodation is included for the IT hub, nursery and administration facilities demolished to allow construction of the new building. Decant accommodation is not included for the demolished residences.

Decant accommodation is not included for the refurbishment option with an allowance included for decant phasing costs.

An allowance is included to make secure and provide hoarding around the existing hospital to prevent unauthorised access. This applies to the new build and refurbishment options.

The equipment allowance is included as a percentage to reflect the potential equipment requirements for the building based on benchmark information.

An allowance of 10% has been included as a Contingency. No provision for Optimisation Bias has been included in the capital costs.

Vat has been included at the current prevailing rate of 20%. Vat reclaim has been included for all design fees to the new build option. Vat reclaim has been included for design fees and asbestos removal for the refurbishment option.

The capital costs have been costed at 4Q 2021 price levels with a forecast PUBSEC Index of 269. Costs have also been presented at the Business Case Reporting Index of 250. It is recognised that future adjustments to these costs will be made against the Business Case Reporting Index of 250.

8.2 Cost Summary Table

Refurbishment

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£10,769,015	£169,915,802	£69,275,100	£66,275,100	£66,275,100
On-costs	Incl	Incl	£16,022,270	£15,715,445	£15,715,445
Location adjustment	Incl	Incl	£0	£0	£0
Fees	Incl	Incl	£15,780,013	£15,168,251	£15,168,251
Non-works cost	Incl	Incl	£10,239,974	£10,146,905	£10,146,905
Equipment costs	Incl	Incl	£5,422,008	£5,302,008	£5,302,008
Contingency	Incl	Incl	£11,673,936	£11,260,771	£11,260,771
VAT reclaim	Incl	Incl	-£2,730,002	-£2,628,042	-£2,628,042
Project cost	£10,769,015*	£169,915,802	£125,683,299	£121,240,438	£121,240,438

New Build

	Do Nothing	Do Minimum	Minimum Efficiency	Likely Efficiency	Maximum Efficiency
Departmental cost	£10,769,015	£169,915,802	£77,119,248	£57,268,536	£57,268,536
On-costs	Incl	Incl	£7,847,866	£6,994,997	£6,994,997
Location adjustment	Incl	Incl	£0	£0	£0
Fees	Incl	Incl	£15,718,916	£11,888,754	£11,888,754
Non-works cost	Incl	Incl	£13,604,111	£11,910,215	£11,910,215
Equipment costs	Incl	Incl	£6,169,540	£4,581,483	£4,581,483
Contingency	Incl	Incl	£12,045,968	£9,264,398	£9,264,398
VAT reclaim	Incl	Incl	-£2,619,819	-£1,981,459	-£1,981,459
Project cost	£10,769,015*	£169,915,802	£129,885,830	£99,926,924	£99,926,924

* Cost at March 2021 Price Level

Note:
All figures listed above in black are gross costs inclusive of VAT



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BDP.