



Installation of a 5th Linear Accelerator at the South West Wales Cancer Centre, Singleton Hospital

Version 12

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Contents

1	The Strategic Case	1
1.1	Introduction.....	1
1.2	Background	2
1.3	Recommendation	3
2	Strategic Context	4
2.1	Introduction.....	3
2.2	Service Detail.....	3
2.3	National Context.....	4
2.3	Local Context.....	4
2.5	Spend Objectives	6
2.6	Business Needs	8
2.7	Future Workforce & Workforce Training.....	9
2.8	Workforce Plan	10
2.9	Digital Strategy	10
2.10	Artificial Intelligence (AI).....	11
2.11	Potential Service Scope	11
2.12	Main Outcomes and Benefits	11
2.13	Main Risks	12
2.14	Constraints and Dependencies	13
3	The Economic Case.....	14
3.1	Introduction.....	14
3.2	Critical Success Factors.....	14
3.3	Framework Option Appraisal.....	14
3.4	Summary of Short List Options	18
3.5	Economic Appraisal of the Shortlisted Options	19
3.6	Risk Appraisal	20
	The Preferred Option	21
4	The Commercial Case	22
4.1	Introduction.....	22
4.2	Required Services	22
4.3	Key Appointments & Contract Arrangements	22
4.4	Required Facilities and Compliance.....	23
4.5	Potential for Risk Management	23
4.6	Agreed Charging Mechanisms & Contracts.....	23
4.7	Agreed Contact Length	23
4.8	Personnel Implications (including TUPE).....	23
4.9	FRS5 - Accountancy Treatment.....	23
4.10	Indicative Timescales	23

5	Funding and Affordability	24
5.1	Introduction.....	24
5.2	Capital	24
5.3	Recurring Revenue Costs	24
5.4	Impact on the Balance Sheet and Impairment.....	27
5.5	Overall Affordability	28
6	The Management Case	29
6.1	Introduction.....	29
6.2	Project Management Arrangements	29
6.3	Stakeholder Involvement.....	29
6.4	Use of Special Advisers	30
6.5	Project Bank Account	30
6.6	AEDET (Achieving Excellence Design Evaluation Toolkit)	30
6.7	Building Research Establishment's Environmental Assessment Method (BREEAM)	30
6.8	Planning Permissions.....	30
6.9	Statutory Approvals	Error! Bookmark not defined.
6.10	Decarbonisation	30
6.11	Benefits Realisation.....	30
6.12	Community Benefits & Social Values	31
6.13	Arrangements for Risk Management	31
6.14	Audit & Assurance	31
6.15	NHS Wales Gateway Assurance	31
6.16	Project Arrangements / Lessons Learned	31
6.17	Contingency Plans	31

Figures

Figure – Spend Objectives.....	6
Figure - Service Issues	8
Figure - Current Staffing Model.....	9
Figure - Additional Staff Requirements	9
Figure - South West Wales' Service Scope Framework Options	11
Figure – Main Benefits	11
Figure – Main Risks	12
Figure - Constraints and Dependencies	13
Figure – Critical Success Factors (CSFs).....	14
Figure – Service Scope Options	15
Figure – Service/Technical Solutions Options	15
Figure – Delivery Options.....	15
Figure – Implementation Solutions Options	15
Figure – Funding Options.....	15

Figure – Summary of the Long List Options	16
Figure - Service Scoping Options Overview	17
Figure – Summary of the Short List Options	18
Figure – Capital Requirements (£000 excl VAT)	19
Figure – Revenue Implications (£000 above baseline excl VAT)	20
Figure – Key indicative milestones	23
Figure – Capital Requirements (£000 incl. non-recoverable VAT)	24
Figure – Revenue Implications (£000 above baseline incl non recoverable VAT)	25
Figure – Impact on the Balance Sheet and Impairment £000s.....	27
Figure – Management Structure	29
Figure – Special Advisors	30

Appendices

Estates Annexe Appendix A2 – Cost Form and Equipment Schedule
Estates Annexe Appendix A3 – VAT Advice
Estates Annex Appendix A4 – NWSSP Audit and Assurance Plan
Estates Annex Appendix A5 – Drawings
Estates Annex Appendix A6 – Indicative Programme
Estates Annex Appendix A7 – Strategic and Operational Risk Register
Estates Annex Appendix A8 – Costed Risk Register
Appendix B – Terms of Reference (TOR)
Appendix C – Benefits Realisation Register
Appendix D – Framework Options Appraisal
Appendix E – Spend Objectives
Appendix F – Framework Workshops
Appendix G – Project Execution Plan
Appendix H – Risk Potential Assessment (RPA)
Appendix I – Integrated Impact Assessment (IIA)
Appendix J – Workorce
Appendix K – Quality Impact Assessment (QIA)
Appendix L – Radiotherapy Monthly Report – May 2026
Appendix M – List of Abbreviations

1 The Strategic Case

1.1 Introduction

This fully tendered business case seeks Welsh Government (WGov) support of £6.832m (including non-recoverable VAT) for strategic capital investment to provide a 5th Linear Accelerator (Linac) within the South West Wales Cancer Centre (SWWCC). The new Linac will be commissioned in the current void bunker at Singleton Hospital.

Swansea Bay University Health Board (SBUHB) and Hywel Dda University Health Board (HDdUHB) jointly developed a Strategic Programme Case (SPC) for the SWWCC to support regional non-surgical oncology services, including radiotherapy and outpatient services. The SPC, approved by both health boards in 2023, outlines the planned development of regional service models and joint business cases. Under the SWWCC Regional Strategic Programme, two groups were established in 2024/25 to take forward key strategic deliverables, including the Radiotherapy Modernisation Group. The main priorities are:

- Implementing a 5th Linac in the current empty bunker at Singleton Hospital
- Developing a 6th bunker at Singleton to maintain capacity during the planned equipment replacement programme
- Exploring options for developing a 6th and 7th working Linac, either at the Hywel Dda Satellite Centre or within Swansea Bay, based on radiotherapy modelling

Following the Health Board's approval in July 2025 to approach Welsh Government for a Business Case Scoping discussion regarding the Linac 5 machine and Linac 6 bunker, agreement was reached with Welsh Government in October 2025 to proceed with the development of three Business Justification Cases (BJCs) as outlined below:

- **BJC 1:** This case supports the introduction of an additional 5th linac within the SWWCC. The proposal has been fully designed and tendered. Following investment and completion of the necessary works, this will result in no remaining spare bunker capacity.
- **BJC2:** This case will support enabling works for the development of works for a 6th spare bunker in Singleton Hospital. This is required to facilitate the planned linac replacement schedule (shown below) which aligns with the national requirements set out in the Service Specification for External Beam Radiotherapy Services in Wales (approved by all Health Boards and NHS Trusts on 31 July 2025). There is a potential change in scope to the previously outlined BJC2, to include a twin (7th) bunker. This report is also highlighting the potential change in scope regarding BJC2, however, at this stage the associated options and choices will need to be developed in detail prior to a decision being reached.
- **BJC 3:** Subject to confirmation of the appropriate business case format, this case will support the future development of Linacs 6 and 7, including the provision of associated clinical space, with the location to be determined. The scope of works and outturn costs are subject to agreement on the preferred site and build solution.

Currently, discussions are ongoing regarding the approach to BJC2, including consideration of single versus twin bunker configurations, including the provision of associated clinical space at Singleton Hospital and their respective implications for the scope of BJC3, future capacity and service sustainability. BJC2 was originally scoped as a single bunker to support the rolling replacement programme (as outlined in the table below). However, a recent critical path analysis indicates that delivery of a satellite centre would take approximately 5–5.5 years, even under an optimistic timeline. This is based on the current position that no suitable site has yet been identified on the Hywel Dda University Health Board estate.

As a result, this timeline does not align with the projected requirement for additional LINAC capacity, specifically the 6th Linac (2029/30) and a potential 7th Linac (2030/31). Given that BJC2 is already planned as a single bunker, there is a strong logistical case for considering an expansion of scope to a twin bunker at this stage, rather than revisiting construction at a later date. This approach would provide greater resilience and create additional capacity headroom for future demand.

The future Linac replacement programme depends on the availability of a spare bunker (BJC2). Without one, replacements could still go ahead, but this would result in approximately 12 months of reduced capacity (20-25%), offsetting the benefits of adding a fifth Linac. In practical terms, while the number of machines available will potentially reduce to 4 during a replacement (until such time bunker comes online), maintaining the capacity of 5 linacs would be require a range of mitigating actions such as significant workforce replanning, service redesign and optimisation of available resources. However, these measures would represent a temporary interim solution and would not be sustainable in the longer term. It is therefore critical to move at pace with the options for BJC2.

There is a risk to the future delivery of the linac replacement programme, which will be influenced by the selected bunker option. The construction and fit-out requirements differ between a single and twin bunker, with the twin bunker option taking longer to deliver. There is also some overlap with when additional linac capacity is needed, creating an added dependency. As a result, the chosen option and any associated delays may impact the replacement schedule. The options and choices will need to be worked through and developed in detail prior to a decision being reached. The associated options will need to be fully explored and developed in detail before any final decision is made.

The planned Linac replacement programme for SWWCC's existing Linacs is based on a lifespan of 10 years as follows:

Linac	Installed	Accepted	Clinical	Ideal Replacement Date	Latest Replacement Date
Lin1	Jul 2017	Sep 2017	Mar 2018	Jul 2027	Mar 2028
Lin2	Mar 2019	Jun 2019	Mar 2020	Mar 2029	Mar 2030
Lin3	Jan 2022	Feb 2022	Jul 2022	Jan 2032	Jul 2032
Lin4	Jan 2023	Feb 2023	Aug 2023	Jan 2033	Aug 2033

The immediate priority is securing funding for the additional 5th Linac, which is required to be operational by mid-2027.

Investment in additional Linac capacity will:

- Support planned demand
- Address backlogs in the radiotherapy treatment pathway
- Support SBUHB in meeting the Welsh Government's "Time to Radiotherapy" measure
- Enable delivery of adaptive Radiotherapy, Stereotactic Radiosurgery (SRS) and more complex treatments, contributing to SWWCC's provision of world-class cancer care

1.2 Background

The South West Wales Cancer Centre (SWWCC) based at Singleton Hospital in Swansea, serves nearly one-third of Wales' population and provides the majority of non-surgical oncology services in South West Wales. As one of only three cancer centres in the country, it plays a central role in delivering high-quality cancer care.

Radiotherapy is a core component of curative (radical) and palliative cancer treatment, used alone or with other modalities in approximately 50% of radical cancer cases. Access rates in Wales remain lower than elsewhere in the UK. At SWWCC, radiotherapy is delivered entirely via Linear Accelerators (Linacs), with 70–80% of capacity dedicated to curative treatment.

Demand for radiotherapy continues to rise due to an ageing population and increasing use of adaptive and complex techniques. Recognising this, SBUHB and HDdUHB jointly approved a 10-year Strategic Plan for Cancer (SPC) in 2023, with sustainable delivery of radiotherapy services identified as a core component. The investment in a 5th Linac is therefore critical to meeting this strategic commitment.

1.3 Recommendation

This business case supports the development of an additional 5th Linac Accelerator at the South West Wales Cancer Centre at Singleton Hospital. The Health Boards' estimate that construction work could start in Q4 26/27 to support operational delivery in Q2 27/28.

We recommend that the Welsh Government approve this project.

Signed and Dated:

Gareth Blandford, Senior Responsible Officer,

Associate Service Group Director, NPTSSG Directors, Swansea Bay University Health Board

2 Strategic Context

2.1 Introduction

This section outlines the strategic context for this investment.

2.2 Service Detail

Radiotherapy (RT) is a core cancer treatment, aimed at achieving cure while preserving quality of life. It works by using radiation to destroy cancer cells and can be used in the early stages of disease, once cancer has begun to spread and for palliation in later stage disease. Around 50% of all cancer patients require radiotherapy at some point in their treatment, and this is expected to rise to 60% over the next few years.

The SWWCC, currently operates four Linear Accelerators (Linacs) and one void 'decant' bunker, which is crucial for enabling equipment replacement without reducing treatment capacity. Radiotherapy is delivered in small units called 'fractions', but advances such as 'hypofractionation' allow fewer visits with equivalent patient outcomes. This innovation delayed the need for a 5th Linac at the SWWCC for over five years

However, more complex treatments—such as Stereotactic Body RT (SABR) and hypofractionated RT—require significantly more Linac time, typically 2–3 × 30-minute slots per attendance. As a result, 'slots' have become a more accurate way to measure activity than fractions or attendances. Currently, on average, 1 fraction = 1 attendance = 1.01 slots, with 11.04 slots required for a full radiotherapy course per patient.

Demand is now exceeding available capacity, meaning a new (5th) Linac will be required by 2027, with an additional void bunker needed by 2027/28. This rising demand is being driven by two main factors: **overall growth in ageing population and the increasing use of adaptive radiotherapy.**

Demand, Capacity and Adaptive Radiotherapy

The four existing linacs at the SWWCC have a combined capacity 32,525 slots per year, averaging 8,131 slots per Linac. Before Covid-19, demand had surpassed this capacity, highlighting the need for a 5th Linac machine. In 2018 and 2019, two prostate patient cohorts were outsourced to the Rutherford Cancer Centre to manage the pressure, at an approximate cost £6,000 per patient.

Based on updated modelling, and using 8,131 slots per Linac, the 5th Linac is now projected to be operational in 2027/28 due to programme slippage. A business case for the 6th void bunker is being developed to ensure operational functionality during equipment replacement. Further modelling indicates that an additional Linac will be required approximately every two years thereafter, reaching a total of seven operational Linacs 2030/31. Alongside, a replacement programme for existing linacs reaching end of life age.

Future Linacs Timeline	Activity	Year 0 24/25	Year 1 25/26	Year 2 26/27	Year 3 27/28	Year 4 28/29	Year 5 29/30	Year 6 30/31
Total Demand	Slots	32,141	34,067	35,195	42,659	48,435	54,170	57,887
Current SWWCC Activity (4 Linacs)								
Current Average Activity per Linac (32,525/4)	Slots	8,131	8,131	8,131	8,131	8,131	8,131	8,131
Number of Linacs Required	Slots	4.0	4.2	4.3	5.2	6.0	6.7	7.1
Number of Linacs Timeline		4 Linacs			5 Linacs		6 Linacs	7 Linacs

Adaptive radiotherapy is a key driving factor for demand. This advanced treatment adjusts the radiotherapy plan in real time to account for changes in a patient's anatomy or tumour. Unlike standard

radiotherapy, which follows a fixed treatment plan, adaptive radiotherapy continually updates dose delivery and targeting to improve accuracy and effectiveness. As the most complex form of radiotherapy, it requires daily adaptation, substantially increasing demand on Linac capacity.

For comparison, Velindre NHS Trust serves a population of around 1.5 million and has 10 Linacs (including two new satellite Linacs at Nevill Hall, operational from June 2025). The SWWCC serves around 0.9 million with four Linacs, while North Wales, serving approximately 0.6 million, also has four Linacs.

Interdependencies

The expansion of Linac capacity, including a fifth machine, depends on aligned CT-Sim and treatment planning capacity to ensure effective radiotherapy delivery. A second CT-Sim was approved in 2024 and is currently funded to 34.5%. To support full operation of the fifth Linac, provision must increase to 60% (per annum). Further detail is set out in the Finance Case. These interdependencies support the development of Singleton Hospital as a centre of excellence, improving outcomes and reducing health inequalities in Wales.

2.3 National Context

This business case supports best practice and aims to deliver improved patient flows and a more equitable cancer service for the populations of Swansea Bay and Hywel Dda University Health Boards (UHBs). It aligns with national and local guidance, mandatory requirements, and strategic priorities, including:

- SBUHB Clinical Services Plan 2019–2024
- Regional Clinical Services Plan, agreed by the South West Wales Joint Regional Planning and Delivery Committee (October 2019)
- A Healthier Wales: Our Plan for Health and Social Care (2018)
- Hywel Dda UHB Transforming Clinical Services (TCS) Programme
- SBUHB Cancer Service Improvement Plan 2019–2024
- SBUHB Annual Plan 2019/20
- SBUHB Site Development Control Plan for Singleton Hospital
- Wellbeing and Future Generations (Wales) Act 2015
- NICE guidance and Royal College of Radiologists best practice
- Cancer Delivery Plan for Wales 2016–2020, including SBUHB's Single Cancer Pathway Action Plan and the South West Wales Non-Surgical Oncology Strategy
- Service Specification of External Beam Radiotherapy Services for the NHS in Wales (2024)
- A Cancer Improvement Plan for Wales (2023-2026)
- The Welsh Government Quality Statement for Cancer (2022)

SBUHB and HDUHB support the development of the business case, which 'fits' with SBUHB's *Organisational Strategy: Better Health, Better Care, Better Lives (2019 – 2030)*, *Clinical Services Plan (2019-2024)* and Annual Plan. Which aligns with HDdUHB's 'A Healthier Mid and West Wales' Strategy, Clinical Services Plan and Annual Plan

It supports The Well-Being and Future Generations Act (2015) by:



- Improving the wellbeing of the population Wales by providing access to modern, safe and fully compliant radiotherapy infrastructure.
- Investing in advanced radiotherapy technology to improve patient outcomes and enable staff to work more efficiently.
- Supporting a more sustainable cancer service model by addressing current and future demand and optimising regional capacity.
- Promoting equity of access to timely, high-quality cancer care across SBUHB, HDDUHB and surrounding regions.

The **5th Linac proposal** forms part of SBUHB's longer-term replacement programme for equipment at, or approaching, the end of its operational life

2.4 Local Health Board

This section outlines the strategic context for the additional Linac in the South West Wales Cancer Centre at Singleton Hospital.

Swansea Bay University Health Board

SBUHB serves a population of 390,000 across Swansea and Neath Port Talbot, with an annual budget of approximately £1.8 billion and a workforce of 14,000 staff, 70% of whom provide direct patient care.

SBUHB operates three acute hospital sites (Singleton, Morriston, Neath Port Talbot) and an Acute Mental Health Inpatient Unit at Cefn Coed Hospital. Low and medium secure mental health units are located at Glanrhyd Hospital, Bridgend. The Health Board also provides forensic mental health services for South Wales, community-based mental health and learning disability services, and regional non-surgical specialist cancer services, covering all of Hywel Dda and parts of Powys. Tertiary services, such as Burns and Plastic Surgery, are provided to Wales and the South West of England.

Hywel Dda University Health Board

HDDUHB serves a population of 384,000 people across Carmarthenshire, Ceredigion, Pembrokeshire, and bordering counties. The Health Board operates four major hospitals, has a budget exceeding £1.4bn and employed 9,891 staff, 70% of whom are involved in direct patient care. The region is sparsely populated, with 47.9% of residents in Carmarthenshire, 20.7% in Ceredigion, and 31.4% in Pembrokeshire.

Regional Service Provision

The SWWCC also serves populations in Bridgend and South Powys (133,800 people). SBUHB's vision is to be a centre of excellence, offering excellent healthcare, teaching and research organisation

Part B - The Case for Change

The investment will provide an additional, 5th Linac Accelerator in the currently empty bunker at Singleton Hospital to meet rising demand for radiotherapy treatment for cancer patients across South West Wales. The bunker will be upgraded and configured to accommodate a modern, safe Linac, ensuring a secure environment for staff to deliver treatment. This investment will increase patient capacity, enhance service resilience and reduce the potential for outsourced radiotherapy treatments.

2.5 Spend Objectives

The key spend objectives supports SBU's business needs by increasing capacity to radiotherapy treatment. These objectives align with NHS Infrastructure Investment Guidance objectives and criteria. In particular, they align with SBU's strategic response to access pressures as set out in "*Changing for the Future*" which references Morriston and Singleton Hospitals' roles as a centre of excellence.

This project's key spend objectives are as follows:

Figure – Spend Objectives

Spend Objective 1	The additional 5 th Linac will provide increased radiotherapy treatment capacity at the SWWCC and support the implementation of a clinical adaptive radiotherapy service, to meet the needs of patient demand. Installation and clinical commissioning to be complete by May 2027.
Spend Objective 2	To improve the quality of service . This will be evidenced by; improved patient outcomes and meeting forecast changes in demand and current demand.

Spend Objective 3	To improve clinical efficiencies by providing additional and reliable Linac capacity, reducing disruption for patients during their treatment.
Spend Objective 4	To improve access to complex cancer treatments for patient, enabling patients with the greatest health needs to have access to modern, high quality cancer treatments, addressing inequalities across South West Wales.
Spend Objective 5	To improve economies by optimising local care and reducing the need for outsourced radiotherapy treatment.

All the above to be achieved 12-18 months following the handover of the 5th Linac Accelerator, subject to funding and planning approvals. Please see **Appendix C – Benefits Realisation and Appendix E Spend Objectives**. There are no potential dis-benefits.

Problems with Status Quo

The 5th Linac is required to meet growing demand. Investment in the 5th Lin Acc within SBUHB will ensure the continuity of clinical treatment, capacity, and ensure access to modern and enhanced technologies.

The SWWCC currently operations four Linacs to deliver radiotherapy services for a population of approximately 0.9million patients across Swansea Bay, Hywel Dda and parts of Powys. The current provision is inadequate to deal with the patient population and growing demand driven by increasing cancer incidence and ageing population. Access times for radiotherapy are not consistently meeting national metrics, particularly for schedule and urgent symptom control cases.

The capacity shortfall has a range of negative impacts on both patients and staff, including:

- Delayed access to curative or palliative radiotherapy, affecting patient outcomes and overall wellbeing.
- Increased operational pressures on staff, with reduced flexibility to deliver complex treatments with safe and effective timelines.
- Potential bottlenecks in the treatment workflows
- Limited ability to meet future demand, with the current modelling indicating the need for a 5th Linac in 2027/2028, with an additional linac and void bunker to ensure continuity during equipment replacement by 2028/2029

Without investment in the 5th Linac and associated future void bunkers, the SWWCC will continue to face treatment backlogs, reduced service resilience and inequitable access to cancer care. This will compromise the Health Boards ability to deliver Welsh Government targets, the Single Cancer Pathway and strategic objectives for delivering safe, modern and sustainable radiotherapy across the region.

The SWWCC currently has 3 quality related risks on the Health Board risk register, relating to service delivery, investment in the additional linac will help to reduce the severity of some of the risks:

- **Datix ID no. 89** (risk rating 16) relates to Clinical Risk of target breaches in the provision of radical radiotherapy treatment.
- **Datix ID no. 2599** (risk rating 20) relates to limited resilience within the SWWCC due to the over reliance on current scanners. Failure of key equipment could result in 25% reduction in treatment capacity, or in the case of CT failure, a complete inability to deliver radiotherapy.
- **Datix ID no. 2593** (risk rating 15) is specific to Radiotherapy Physics outgrowing its current space, with increased staff levels and patient capacity the department is finding it difficult to provide a sustainable service.

Figure - Service Issues

	Service Issue	Mitigation
Quality	Limited capacity constrains delivery of advanced treatments; aging equipment may affect treatment precision and safety	Investment in 5th Linac and ongoing replacement programme; implement robust maintenance and staff training for advanced techniques
Patient Experience	Longer waiting times; scheduling inflexibility; travel burden for rural patients	Increase Linac capacity; reduce Time to Radiotherapy, flexible scheduling; regional coordination of referrals; communication with patients on treatment timelines
Future Needs	Rising demand due to population growth and advanced treatment modalities; need for further Linacs by 2030/31	Long-term workforce and infrastructure planning; phased implementation of 6th and 7th Linacs; horizon scanning for new technologies
Research	Limited capacity restricts clinical research and trial participation; older equipment limits innovation	Modern Linac with advanced capabilities to enable research; partnership with universities and research networks; dedicated research slots within schedule
Reliability	Dependence on four Linacs increases risk of service disruption.	Redundant Linac capacity via 5th machine; contingency plans; ongoing equipment monitoring and replacement strategy
Access	Delays in treatment; some patients may miss national targets; rural populations affected	Increase treatment slots; implement hypofractionation to optimize capacity; coordinate regional referrals; develop outreach solutions
Hospital/Staff Benefits	Staff stress due to workload; limited training opportunities; recruitment/retention challenges	Modern facilities improve workflow; training for advanced techniques; career development pathways; improve working environment and operational efficiency
Maintenance Considerations	Aging Linacs require more maintenance, disrupting service delivery and patient treatment.	Install a 5th Linac, with plans to invest in an additional dedicated void bunker for uninterrupted service; proactive maintenance schedule; contingency planning for downtime

2.6 Business Needs

The key business needs are as follows:

- **Improve Clinical Outcomes:** The current Linac provision is insufficient for the growing, aging population and acuity of the patient. Due to the age of the existing Linacs, breakdowns are becoming more frequent which can impact of patient care and deliverability of radiotherapy treatment.
- **Improve Patient Experience:** At the SWWWC, patient experience is a key focus throughout the radiotherapy journey. From the first planning appointment, patients receive careful support to ensure treatment is safe, accurate and as comfortable as possible. Radiographers guide patients through positioning, scans and marking, and provide a 'First Day Chat' to answer questions and ease concerns. The additional Linac would not only increase treatment capacity but also strengthen the patient experience by making the radiotherapy journey smoother, more predictable, and less stressful. Singleton Hospital's commitment to patient-centred care ensures that each individual is supported before, during, and after treatment, enhancing both clinical outcomes and overall satisfaction.

- **Capacity & Compliance with Best Practice:** The current Linac provision is not currently meeting performance metrics against Time to Radiotherapy, without investment, the position will continue to deteriorate.
- **Trained and Supported Workforce:** The investment in an additional Linac will require increased workforce to enable the expansion of radiotherapy capacity to support the timely delivery of safe and effective treatment to cancer patients. The new linac will require a proportionate uplift in radiotherapy, physics, dosimetry and support staff to ensure safe and sustainable operation.

The expansion will reduce operational pressure and support-maintained compliance with radiotherapy quality and safety standards. Overall, the development will strengthen service resilience, improve efficiency, and support a sustainable workforce model. The current staffing model which facilitates 4 Linacs (current baseline) is as follows:

Figure - Current Staffing Model

Current Baseline: 4 Linacs			
Department	Description	Pay band	WTE
Medical Physics	Healthcare Scientists	7	3.8
		8a	2.7
		8b	1
	Medical Physics Experts	8c	1.80
		8d	0.40
Radiotherapy	Radiographer	8b	1.5
	Radiographer	8a	4.8
		7	8
		6	9
		5	11
	Registered Nurse	5	2.80
	Radiography Support	3	5.65
		2	1
Oncology	Consultant	Consultant	4
Total WTE			67.45

2.7 Future Workforce & Workforce Training

To ensure deliverability of a 5th Linac, a future proofed workforce needs to be in place. Any additional workforce requirements are included in the revenue affordability section of the business case.

The range of staff to be employed for the additional Linac and Adaptive Radiotherapy includes the following:

Figure - Additional Staff Requirements

Additional Staff: Linac 5			
Department	Description	Pay band	WTE
Medical Physics	Dosimetrist / Engineers	Band 7	2.20
	Dosimetrist	Band 6	0.80
	Dosimetrist	Band 5	1.00
	Healthcare Scientist	Band 7 (+B6)	1.80
	Medical Physics Experts	Band 8a	1.00
Radiotherapy	Radiographer	Band 8b	1.00
	Radiographer	Band 8a	1.00
	Radiographer	Band 7	2.00
	Radiographer	Band 6	2.00
	Radiographer	Band 5	3.00
	Radiography Support	Band 4	1.00

	Radiography Support	Band 3	1.00
	Radiographer - Palliative	Band 7	1.50
	Radiographer	Band 8b	1.00
Oncology	Oncology	Consultant	1.00
Total			21.30

2.8 Workforce Plan

SBUHB Radiotherapy and Radiotherapy Physics teams have developed a workforce strategy to support the delivery of modern radiotherapy services across South West Wales. The Health Board does not anticipate any staffing challenges for the 5th Linac and is proactively implementing strategies to provide alternative routes to registration and training for advanced and consultant radiographers. SBUHB is also working closely with Health Education and Improvement Wales (HEIW) to secure funded training opportunities for staff across all levels of the radiotherapy workforce.

Details of the Radiotherapy Services and Radiotherapy Physics Workforce Plans can be found in Appendix K – Workforce Model

2.9 Digital Strategy

The Radiotherapy Physics Team at the South West Wales Cancer Centre leads the digital aspects (infrastructure and software) of radiotherapy services across the region. The department operates a fully paperless service, supported by secure remote access systems that enable clinical and technical innovation and collaboration across NHS Wales sites, including Betsi Cadwalader University Health Board, Hywel Dda University Health Board and Velindre Trust. This digital infrastructure supports resilience, multidisciplinary working and equitable access to specialist expertise.

Investment in a fifth Linac strengthens alignment with the organisation's Linac programme and embeds AI-enabled functionality within core treatment systems. Enhanced imaging and online and offline adaptive radiotherapy capabilities support efficient treatment optimisation and highly personalised care at each session. Adaptive functionality may reduce additional appointments, improve patient experience and outcomes and reduce time spent in hospital.

The investment will also standardise system architecture across machines, improving interoperability, flexibility and digital continuity. Patients can therefore be transferred between linacs during peak demand or maintenance, minimising disruption and strengthening business continuity.

The Radiotherapy Department is paperless and applies digital transformation through operational dashboards that monitor activity, patient pathways and capacity. Real-time reporting enables proactive pathway redesign, performance management and continuous improvement. Integration of the new linac will enhance data capture, reporting and strategic oversight.

Overall, the proposal advances the Health Board's digital strategy by improving interoperability, enabling adaptive care, strengthening regional collaboration and supporting data driven service improvement to optimise patient outcomes.

2.10 Artificial Intelligence (AI)

AI functionality is integrated within the Linac platform and supports multiple aspects of the radiotherapy pathway. The system is designed to enhance flexibility and precision through AI-based decision support and remote access capabilities, providing clinical teams with tools to support accurate and adaptable treatment delivery.

AI-enhanced imaging, in combination with both online and offline adaptive capabilities, enables treatment to be reviewed and adapted where appropriate. This supports the delivery of highly personalised radiotherapy for patients at each treatment session, reflecting anatomical or clinical changes over the course of treatment.

In addition, AI tools within the linac platform support efficient workflow management and predictive maintenance, helping to anticipate potential equipment faults and reduce unplanned downtime. This contributes to service resilience, operational efficiency, and continuity of patient care.

Over the lifespan of the linear accelerator, further AI-enabled software add-ons may be introduced to support ongoing advances in adaptive radiotherapy and technological innovation. This ensures the system remains aligned with future developments in cancer treatment and continues to support improvements in patient outcomes.

2.11 Potential Service Scope

The potential service scope framework options for this project are as follows:

Figure - South West Wales' Service Scope Framework Options

Option 1 - Business As Usual	Option 2 - Do Minimum
Maintain the status quo of 4 Linacs	Install an additional 5 th Linac in the empty bunker at Singleton Hospital

2.12 Main Outcomes and Benefits

The main potential outcomes benefits are classified in terms of cash releasing benefits (CRBs), non-cash releasing benefits (NCRBs), quantifiable or quantitative benefits (QB), and non-quantifiable or qualitative benefits (NQBs) as follows:

Figure – Main Benefits

Description of Benefit	Beneficiary	Target Improvement
Health Gain		
Improved health outcomes and enhanced patient pathways	Patients Staff Health Boards NHS Wales	Increased capacity to meet some patient demand. The Health Board will then require additional Linacs to continue the development of the SWWCC and improvement of Linac Demand and Capacity.
Additional Linac capacity and new technology will support highly complex cancer cases through Stereotactic Radiosurgery (SRS) and Adaptive Radiotherapy		Reduced Time to Radiotherapy and the number of patients receiving adaptive radiotherapy
Clinical Skills and Sustainability		
Enhanced clinical staff capacity and skills sustainability by expanding facilities and training on advanced radiotherapy technologies with the new Linac	Patients Staff Health Boards NHS Wales	Increase staff training on adaptive radiotherapy techniques by up to 40% within 12-months of the additional Linac being operational.
Supports Radiotherapy and Radiotherapy Physics workforce plans by attracting newly qualified and highly experienced RT professionals		This will be measured through the number of training courses attended, number of trainees/junior staff undertaking formal qualifications and increased training plans through Elekta.

Equity		
Improve equity of access across South West Wales to ensure high quality cancer treatment and treatment planning services.	Patients Staff Health Boards NHS Wales	This investment supports the implementation of Stereotactic Radiosurgery (SRS) and Adaptive Radiotherapy to provide equity of patients across Wales. The additional capacity will increase service delivery and support patient demand.
Investment will reduce inconsistency in service due to machine breakdowns and reduce some reliance on out-sourced patient care.		Reduction in appointment delays and rescheduling due to equipment breakdowns, alongside decreased reliance on out-of-area outsourced cancer treatment, delivering a cost avoidance of £5,938 per patient.
VfM		
An additional Linac will deliver modern, resilient radiotherapy services that optimise clinical outcomes and operational efficiencies.	Patients Staff Health Boards NHS Wales	Post commissioning and operational metrics will reflect improvements in efficiency, reduced service disruptions and the reduction of outsourced care.

See Appendix C – Benefits Realisation for detailed information.

2.13 Main Risks

The main business and service risks associated with the potential scope options for this project together with their counter measures, are detailed in **Appendix A Estates Annexe A7..** The main risks are as follows:

Figure – Main Risks

Risk	Probability	Impact	Score	Mitigation
Strategic / Planning / Financial				
Limited resilience within the South West Wales Cancer Centre due to the over reliance on current scanners. Failure of key equipment could result in 25% reduction in treatment capacity. (Datix ID 2599)	5	5	20	Production of a Business Justification Case to seek investment to support additional 5 th Linac capacity by 2027, together with a secondary business case to support an operational 6 th and 7 th bunker.
Clinical risk of target breaches in the provision of radical radiotherapy due to demand and capacity issues (Datix ID No. 89)	4	4	16	Develop a Business Justification Case to seek investment to support additional capacity to manage patient demand and reduce RT Treatment breaches. Radiotherapy teams to regularly review breaches and report back through relevant RT Groups.
Radiotherapy Physics is outgrowing its current space; with increased staff levels and patient capacity the department is finding it difficult to provide a sustainable service (Datix ID 2593)	4	4	16	Alternative space must be sought for support and storage. Whilst this is not feasible within the project scope for Linac 5 this will be reviewed for future developments within the SWWCC.
Failure to secure Welsh Government capital funding, poses a critical threat to patient outcomes. This will manifest as increased treatment delays and interruptions, directly compromising patient health and the ability to meet national cancer standards, while also leading to reduced operation capacity, heightened workforce pressure, and significant financial reputational repercussions.	3	5	15	SBUHB to develop a business justification case to seek Capital Investment of the additional Linac Machine and maintain regular dialogue with key stakeholders. Finance Business Partners to report regularly to Project Board re. revenue implication Radiotherapy Clinical Teams to report on patient risk and time to

				radiotherapy data.
Increases to the Schedule of Accommodation (SoA) during the design stage impacting capital affordability, and/or further increases during delivery resulting in costs exceeding the approved business case value.	3	4	12	The project must be delivered within the agreed scope. The Project Director will manage and approve any requests for change.
Capital Costs – Exceeding the anticipated budget	3	3	9	Appoint a Cost Advisor to review costs on a regular basis.
Revenue affordability - Affordability of revenue model is over/under estimated	3	3	9	Finance lead reports regularly to Project Board.
Construction Phase				
Working within live environment	3	3	9	Clear segregation/Project managed user group meetings
General disruption due to construction activity	3	3	9	Stakeholder engagement with users
Construction noise, adjacent buildings: general acoustics	3	3	9	Constant Review

2.14 Constraints and Dependencies

The key project constraints are as follows:

Figure - Constraints and Dependencies

Constraint	Mitigation
The solution must be integrated, fit for purpose, make best use of the available space at preferred site.	Appoint an expert design team to inform feasibility and detailed design development and sign-off plans with management / Clinical lead.
The solution must be delivered on a timely basis.	Engage with Welsh Government to ensure timely support for funding and work with a reputable constructor to work up a design solution & construction timetable, that fits as closely as possible, with the clients' expectations.
The solution must be delivered within project budget.	Work with expert design team / reputable constructor to design a fully compliant product, which meets the clients brief as cost effectively as possible.
The solution should provide value for money and be affordable in capital & revenue terms.	Ensure the business case includes robust revenue and capital affordability proposals, which represent good use of public monies, is endorsed by the Health Board/key stakeholders, and in due course secures Welsh Government approval.
The solution should support clinical needs and improve the patient experience.	The solution must meet the clinical brief and align with the Health Board's strategic direction and best practice.
Dependency	Mitigation
The solution must be supported by a fully trained and resourced workforce.	Develop a Workforce Plan to support the new facility.
Continued support for the agreed Primary Care model of care.	Project supports Health Board's Clinical Services Plan and is endorsed by the Health Board.
The solution must be fully supported by external partners to secure capital investment	Develop working relationships with key stakeholders ensuring project alignment and support throughout the project life cycle.

3 The Economic Case

3.1 Introduction

In accordance with the Capital Investment Manual and requirements of HMT's *The Green Book* (2020), this section of the business case demonstrates the wide range of options that have been considered in response to the potential scope identified in this business case.

3.2 Critical Success Factors

The following Critical Success Factors (CSFs) formed the basis for informing evaluation of the project's potential options. Please see below:

Figure – Critical Success Factors (CSFs)

Critical Success Factor		How well the option satisfies the CSF
CSF1	Strategic fit and business needs	Meets the agreed spending objectives, business needs and service requirements; Provides holistic 'fit' and synergy with other national, regional and local strategies, and; 'Fits' with national programmes and local projects.
CSF2	Compliance	The solution must comply with best practice and support improved 'Time to Radiotherapy' targets.
CSF3	Benefits Optimisation	Optimises benefits through effective use of resource and value for money
CSF4	Potential achievability	Is likely to be deliverable on a timely basis to avoid disruption to clinical services and patient outcomes; must ensure available skills required for successful delivery
CSF5	Potential affordability	The organisations (SBU and HDU) ability to fund the required level of expenditure; the revenue consequences associated with the proposed investment
CSF6	Potential Acceptability	The investment must utilise proven technology that ensures reliable delivery and is supported by an established supplier with the capability to provide installation, maintenance, training and technical support. This must be acceptable to clinicians and patients

3.3 Framework Option Appraisal

This section of the business case explains the process for the project's framework options, within the context of its own population's business and clinical needs, and local service drivers. In accordance with HM Treasury's *Green Book* 2020 (A Guide to Investment Appraisal in the Public Sector) and Better Business Case guidance the solution proposed in this case is based on the following five categories of choice:

- Service Scope – potential service and geographical coverage (the 'what')
- Service/Technical Solution - potential services and technical solutions (the 'how')
- Service Delivery – potential options for delivering the required services (the 'who')
- Implementation Solution - timing and phasing of local delivery (the 'when')
- Finance Solution - funding of the investment

The Project Board's members reviewed the spend objectives, CSFs and agreed framework options and developed local framework options at a Workshop on the 26th of March 2026. A list of participants is attached in **Appendix F – Framework Workshop**.

Members completed a hi-level SWOT-style analysis of the long list options. An option scored 'x' if it failed to deliver on an SO or CSF, '~' if it partially delivered, and '✓' if it fully delivered as follows:

Key:	X Not Achieved	~ Partially achieved	✓ Fully achieved
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Options 'scored' multiples of '✓' if an option optimally delivered on an updated Spend Objective or CSF. The pros and cons for each long list option were recorded to provide an audit trail, and the options were be ranked in order of achievement, indicating the 'preferred' solution and 'do less' or 'do more ambitious' solutions as appropriate. Summary of Long List Framework Options

The Board members agreed the framework options as follows:

Figure – Service Scope Options

Business As Usual	Do Minimum
SWWCC to continue service delivery with the current Linac infrastructure and service delivery.	Investment in an additional Linac Accelerator to support current and future demand and capacity
Discount	Preferred

The technical solutions identified potential options for delivering the preferred service scope option. They were agreed as follows:

Figure – Service/Technical Solutions Options

Business As Usual	Do Less	Do Minimum	Do Minimum / Preferred	Do Maximum
SWWCC to continue service delivery with the current Linac infrastructure and service delivery. The service has poor resilience due to aging equipment and is unable to meet South West Wales Linac Radiotherapy needs. BAU is not meeting current performance metrics and would further deteriorate performance targets	Outsource to an adjacent Health Board or Private Sector Provider	Invest in an additional Linac Accelerator at Hwyl Dda University Health Board	Invest in an additional 5 th Linac Accelerator at the SWWCC, Singleton Hospital	Invest in an additional 5 th Linac Accelerator at the SWWCC, Singleton Hospital with additional clinical and support space
Discounted	Discounted	Discounted	Preferred	Do Maximum

Due to the requirement for a fifth linac, additional CT simulation (CT SIM) support and capacity will be needed to ensure its effective operation. Further information can be found in the Finance Case.

The service delivery options identified the potential timescales options for delivering the preferred scope, preferred technical solution. They were agreed as follows:

Figure – Delivery Options

Business As Usual	Do Maximum
NHS Delivery	Non-NHS Delivery
Preferred	Discounted

The implementation options identified the means for delivering the preferred service solution, technical solution and delivery solution. They were agreed as follows:

Figure – Implementation Solutions Options

Do Minimum	Maximum
Phased Delivery	Not Phased
Discounted	Preferred

The funding options identified the funding solutions for delivering the preferred service solution, technical solution implementation solution and delivery option. They were agreed as follows:

Figure – Funding Options

Do Minimum	Intermediate/Do Maximum
Capital Funding	Private / Public Partnership Funding
Preferred	Discounted

The long list of local framework options are summarised below:

Figure – Summary of the Long List Options

Framework Options	BAU Option 1	Option 2	Option 3	Option 4	Option 5
Service Scope	Business as usual	Provide a more resilient Linac Programme and Service Model for the SWWCC, ensuring there is improved capacity to meet the future needs of Radiotherapy requirements.			
	Discount	Preferred			
Service Technical Solution		Outsource to an adjacent Health Board or Public Sector provider	Invest in an additional Linac Accelerator at SWWCC	Invest in an additional Linac Accelerator at HDUHB	Invest in an additional Linac Accelerator at SWWCC with additional clinical and storage space
		Discount	Preferred	Preferred	Do Maximum
Service Delivery		Non-NHS Delivery	NHS Delivery		
		Discount	Preferred		
Implementation Solution		Non-Phased	Phased Delivery		
		Discount	Preferred		
Funding Solution		Private/Public Partnership Funding Option	Capital Funding Solution		
		Discount	Preferred		

Figure - Framework Options Overview

Potential Service Scoping Options	SC Option 1	SC Option 2	SC Option 3	SC Option 4	SC Option 5
	Business as Usual (BAU) no change to the SWWCC Linac Provision	Outsource to an adjacent Health Board or Private Sector Provider	Invest in an additional Linac Accelerator at SWWCC	Invest in an additional Linac Accelerator at HDUHB	Invest in an additional Linac Accelerator with additional clinical and support space
Spend Objectives:					
1. Provide increased radiotherapy and adaptive radiotherapy treatment capacity to meet patient demand by 2027/28	X	X	✓	✓	X
2. To improve the quality of service. This will be evidenced by; improved patient outcomes, meeting current and forecast changes in demand that is suitable for patient need.	X	X	✓	X	✓
3. To improve clinical efficiencies by providing additional and reliable Linac capacity, reducing disruption for patients during their treatment.	X	X	✓	✓	✓
4. To improve access to complex cancer treatments for patient, enabling patients with the greatest health needs to have access to modern, high quality cancer treatments, addressing inequalities across Southwest Wales.	X	X	✓	✓	✓
5. To improve economies by optimising local care and reducing the need for outsourced radiotherapy treatment	X	X	✓	✓	✓
Critical Success Factors:					
1.Strategic Fit & Business Needs	X	X	✓	✓	✓
2. Benefits Optimisation	X	X	✓	✓	X
3.Compliance	X	✓	✓	✓	✓
4. Potential Achievability	X	✓	✓	X	X
5. Potential Affordability	✓	X	✓	✓	X
6. Supplier Capacity & Capability	X	X	✓	✓	✓
Summary:	Discount (Retain a baseline comparator)	Discount	Preferred	Discount	Discount

Please see **Appendix D – Option Appraisal** for details of the Long List appraisal process and the rationale for accepting or rejecting local framework options.

3.4 Summary of Short List Options

The Board members identified the following four shortlisted local options to be taken forward for detailed financial analysis:

Figure – Summary of the Short List Options

Options	Reason for Acceptance or Rejection for Further Consideration	Finding
Option 1: Business as Usual	Fails to deliver required Spend Objectives and Critical Success Factors.	Discounted (retained as Baseline Comparator)
Option 3: Additional 5 th Linac at South West Wales Cancer Centre	Delivers all the required Spend Objectives and Critical Success Factors.	Preferred Option

Business as Usual:

The current radiotherapy service lacks sufficient resilience to meet the existing and growing demand for Linac radiotherapy treatment across South West Wales. Performance against the All-Wales Radiotherapy Quality Metrics, including the 14-day treatment targets and Reducing Time to Radiotherapy (RT) measures, is currently and consistently below the required standard and is expected to deteriorate further without investment in an additional Linac. In the medium term, the position presents a significant clinical risk, driven by increasing demand for cancer treatment associated with an ageing population, and advancements in techniques. Limited treatment capacity will lead to further delays in treatment and could negatively influence patient outcomes, with some cases leading to loss of life.

Maintaining the current “Business as Usual / Do Nothing” position would not have an immediate impact on the Health Board’s revenue position for Linac treatment. However, longer-term financial pressures are likely to arise as a result of insufficient capacity. These include the increased need to outsource cancer treatments, i.e., utilising Velindre Cancer Centre, which often results in a suboptimal patient experience, at an estimated minimum cost of the 5th Linac revenue cost.

In addition, limited capacity reduces opportunities to improve patient pathways by using axillary radiotherapy as an alternative to axillary surgery. Axillary surgery costs approximately £9,000 per patient, compared with approximately £3,000 for complex radiotherapy supported by technical input. This presents a potential opportunity to improve services, whilst also achieving cost efficiencies. The approach is supported by a position statement from the Wales Cancer Network and the Clinica Oncology Sub-Committee of the Welsh Scientific Advisory Committee, which was formally ratified on 13 January 2025.

Consequently, while the revenue implications associated with the current preferred option would require investment in the short term, comparable or greater financial pressures could materialise in future years under the ‘Do Nothing’ scenario due to the ageing population and increasing demand for cancer care services across Wales.

The Preferred Option:

If investment is approved to support the additional Linac, the Health Board will significantly improve its projected demand and capacity position by 2027/28. Radiotherapy performance metrics from May 2026 demonstrated an average patient wait time of **27 days**, with **86%** of patients treated outside of the target timeframe. Investment in an additional Linac would reduce Time to Radiotherapy delays and deliver

clear, measurable improvements in patient care, evidence by an increased number of patients receiving Radiotherapy and Adaptive Radiotherapy Treatment.

The proposal will also reduce expenditure associated with outsourced commissioned care and support a reduction in surgical interventions through the increased use of radiotherapy pathways. In addition, an extra Linac would strengthen service resilience and continuity, particularly during periods of machine breakdown or maintenance, which contribute to fragmented patient pathways.

The additional capacity would reduce the number of rearranged or delayed appointments, lessen resilience on outsourced cancer treatments, and support the delivery of safer, high quality patient outcomes. Overall, this option provides an essential balance of clinical benefit, operational resilience and long-term service sustainability.

Please see **Appendix D – Option Appraisal** for details of the shorting appraisal process and for details of the preferred location option appraisal process (workshop held on the 27th March 2026).

3.5 Economic Appraisal of the Shortlisted Options

The economic appraisal evaluates the costs, benefits and risks of the shortlisted options and identifies the option that is most likely to offer the best VfM in accordance with HM Treasury Green Book and WGov business case guidance.

Capital Costs

The project's capital cost estimate from RIBA stage 3 (design feasibility) was prepared by the Health Boards' Cost Advisor, AECOM. The selected contractor has since provided fully tendered costs, reflecting RIBA Stage 4 (a fully developed design and tender package). These costs have been reviewed and scrutinised by the Cost Advisor, who has produced a report confirming that the project represents good value for money and that the submitted costs are in line with current market rates and conditions.

Planning contingency was estimated by AECOM at 4.99% of works, non-works, equipment and fees. The capital costs for each shortlisted option are as follows:

Figure – Capital Requirements (£000 excl VAT)

	Preferred
Works Costs	351
Fees	88
Non-Works Costs	124
Equipment Costs	5,116
Planning Contingency	28
Total	5,708

The key assumptions underlying the development of the capital costs are:

- Capital Cost includes works, non-works, abnormals allowances, equipment costs and risk contingency, which is assessed at 4.99%.
- VAT has been excluded from this section of the case.
- The Business as Usual option (Option 1) was retained as the baseline comparator.
- This business case excludes Optimism Bias and a Comprehensive Investment Appraisal (CIA) model.

Recurring Revenue Costs

The baseline and indicative future recurring revenue cost for each shortlisted option are as follows:

Figure – Revenue Implications (£000 above baseline excl VAT)

Costings (NB. pay based on top of scale 2026/27 pay scales)	26/27	27/28	28/29	29/30	30/31
5th Linacc					
Pay Costs - Medical Physics	69	476	508	508	508
Pay Costs - Radiotherapy	0	899	899	899	899
Pay Costs - Oncology Consultants	0	166	191	191	191
Total Pay Costs	69	1,541	1,598	1,598	1,598
Non Pay - Medical Physics & Radiotherapy *	0	156	310	330	330
Non Pay - New Adaptive RT	0	260	300	300	300
Total Non Pay Costs	0	415	610	630	630
Facilities Management Costs	0	34	40	40	40
Total 5th Linacc Costs	69	1,991	2,248	2,268	2,268
CT Sim **					
Pay Costs - Medical Physics	51	154	154	154	154
Pay Costs - Radiotherapy	51	163	163	163	163
Pay Costs - Oncology Consultants	0	96	96	96	96
Total Pay Costs	103	413	413	413	413
Direct Non-Pay Costs	2	68	68	68	68
Medical Physics Artificial Intelligence Software Subscription	0	25	25	25	25
Total Non Pay Costs	2	93	93	93	93
Facilities Management Costs	0	0	0	0	0
Total CT Sim Additional Capacity Costs	105	506	506	506	506
Total Cost	174	2,497	2,754	2,774	2,774

* No Service Maintenance Contract & Support costs in 1st Year due to warranty

** CT Sim costs from funded capacity of 34.5% up to capped capacity of 60%

Given only one Option (Option 3 – Additional Linac to be Installed at Singleton Hospital) was taken forward for further evaluation a CIA (Comprehensive Investment Appraisal) economic appraisal was not undertaken.

3.6 Risk Appraisal

The key risks associated with the preferred option at this stage have been assessed by an independent Cost Advisor with Project Team members using WG guidance methodology for business cases. The scheme risk register reflects an assessment of the pre-construction risks and informs this project's 'knowns' & 'unknowns' at this point in time.

Risks have been apportioned to either the Health Board or private sector and mitigating strategies have been identified in the Risk Register. The risk appraisal was undertaken using the Welsh Government's risk methodology for business cases. It included the following distinct elements:

- Identifying the risks and definitions for assessing options.
- Assessing the impact and likelihood for each option against these categories.
- Calculating the risk score.

The range of scales used to quantify the risk for impact and likelihood was: Low = 2; Medium = 3; High = 5

Likelihood	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
Impact					

The Preferred Option

The preferred option was confirmed as Option 3 to purchase and install an additional 5th Linear Accelerator. This development is within the existing, empty bunker at Singleton Hospital.

The consultants have utilised an equivalent of Autodesk AutoCAD 2D design and the associated drawings were formally approved by the Project Board on 23 March 2026 (refer to Appendix A – Estates Annexe 5 for drawing details).

The scope of this contract includes key deliverables such as enabling works, infrastructure services and connections, and the remodelling and refurbishment of the existing empty treatment and control room, to accommodate an additional Linear Accelerator to support the radiotherapy service provision. It also encompasses a carefully managed transition process to ensure that clinical operations remain uninterrupted during the decommissioning of the existing empty linac bunker, execution of the main construction works, and subsequent commissioning phases. In addition, the Design Team will be responsible for ensuring full compliance with clinical and IM&T requirements, maintaining compatibility with existing systems where necessary.

The design does not incorporate specific decarbonisation measures; however, the scheme adopts a low-intervention approach, retaining existing walls, linings and building systems wherever possible. The air handling unit intended to serve the new Linac was commissioned in 2022 and remain in good condition, supporting ongoing energy efficiency. Further efficiencies are achieved through the introduction of LED lighting. Finishes have been carefully selected to align with the existing building fabric, minimising material usage, limiting scope change and reducing overall design complexity.

4 The Commercial Case

4.1 Introduction

This section of the business case outlines the proposed 'deal' as outlined in the Economic Case. The business case is seeking to secure public funding from the WGov's 'All-Wales Capital Programme'.

4.2 Required Services

Provision of a development of a 5th Lin Acc within the South- West Wales Cancer Centre, which will be commissioned in an existing bunker at Singleton Hospital.

Procurement Route:

The Health Board will deliver the main works and commissioning services via Swansea Bay University Health Boards' Construction Framework, utilising the framework agreements 'rotation system'. This framework is a compliant route to market, developed in collaboration with NWSSP Procurement Services colleagues.

The design has been developed to RIBA Stage 4 (i.e. the design has detailed technical drawings, specifications, and schedules required for tendering and construction to support this application).

The contractor will not be formally awarded a contract until investment from Welsh Government is confirmed.

Specialist Equipment:

The Health Board, together with support from NWSSP Procurement Colleagues, propose to purchase the Linac Accelerator from Elekta. This will be procured via Direct Award against the NHS Supply Chain Framework for *'Radiotherapy Treatment Systems, Associated Options and Related Services'* reference: 2021/S 000-007768. It is not technically viable for the Health Board to consider a competitive tendering exercise due to machine interoperability with other Linacs within the SWWCC.

Elekta has been engaged to provide an initial budget quotation, alongside supporting information outlining how the organisation can contribute to NHS Wales' socio-economic objectives. This includes alignment with the Well-being of Future Generations (Wales) Act 2015, with a particular focus on decarbonisation initiatives and the delivery of wider social value outcomes.

Current anticipated lead times are approximately 12 weeks. However, it should be noted that both programme timescales and associated costs remain subject to change, reflecting ongoing uncertainty within the global political and economic climate. These external factors may impact supply chain logistics, material availability, and procurement timelines. Elekta, will be formally issued a contract following investment approval from Welsh Government.

4.3 Key Appointments & Contract Arrangements

The following key appointments have been made to support delivery of this project:

- Project Manager Services are provided by HLD Design.
- Architectural & Principal Design services are provided by HLD Design.
- Civils and Structural Engineering design services are provided by PHG Consulting Engineers Limited
- Health Board Cost Advisor services and business case support services are provided by AECOM.
- Mechanical & Electrical design services to support feasibility stage and enabling works was provided by AECOM.
- Other technical commissioning services are provided by SBUHB.

All wayfinding will be in accordance with Welsh Language Standards.

4.4 Required Facilities and Compliance

The Additional 5th Linac Accelerator installation will follow Welsh Health Building Note and Welsh Health Technical Memorandum guidance and statutory requirements.

4.5 Potential for Risk Management

A risk register has been compiled and costed relative to risks that apply over the whole of the project lifecycle at this stage (**Appendix A Estates Annexe A8**). The planning contingency has been assessed by an independent cost advisor. The planning contingency includes non-recoverable VAT. This assessment of risk and complies with NHS Wales Shared Services Partnership – Specialist Estates Services (NWSSP - SES) guidance at this planning stage.

4.6 Agreed Charging Mechanisms & Contracts

A collaborative working model is to be adopted. All charging mechanisms will be covered within the framework agreement.

AECOM, the Health Board's appointed Cost Advisor, confirms the scheme is fully tendered.

The design is reflective of RIBA work stage 4 and NEC 4 (Option A) will apply.

Contractors will invoice SBUHB Health Board in accordance with the Payment Mechanism. The agreed Payment Mechanism is 4 weekly assessments by the Health Board Cost Advisor with payment due within 14 days of the Assessment Date.

Arrangements and Change Control Procedures are referenced and managed as part of the model form contract. Change control is strictly managed by the Project Board, specifically by the project director, and any change in cost and scope must be approved by project board. Our independent Cost Advisor, AECOM, acts on Health Board's behalf to manage cost / commercial risk and to ensure mitigations are identified throughout the contract. The Cost Advisor reports directly to Project Board on a regular basis.

4.7 Agreed Contact Length

The main works' contract will cover approx. 17 weeks, subject to agreement with the Main Contractor.

4.8 Personnel Implications (including TUPE)

TUPE (Transfer of Undertaking and Protection of Employee) will not apply to this investment.

4.9 FRS5 - Accountancy Treatment

It is assumed that public funding will be allocated for this project and therefore capital will be included on the balance sheet.

4.10 Indicative Timescales

The indicative milestones are set out below:

Figure – Key indicative milestones

Activity	Due Date
Health Board endorses business case	July 2026
WGov approve business case	October 2026
Agree and Enter Contract / Order Machine	October 2026
Main Works	November 2026
Install Machine (subject to purchase lead times)	November 2026 – January 2027
Handover (subject to contractor's programme)	February 2027
Clinical Commissioning	March 2027
Technical Project Evaluation (approx. 3 months post-commissioning)	June 2027
Benefits Realisation (12 months post operational)	June 2027

5 Funding and Affordability

5.1 Introduction

The purpose of this section is to set out the indicative financial implications of the proposed investment (as set out in the Economic Case) and proposed Deal (as described in the Commercial Case).

5.2 Capital

The tendered capital cost of the project are as follows (**Appendix A Estates Annexe A2**):

Figure – Capital Requirements (£000 incl. non-recoverable VAT)

	Preferred
Works Costs	422
Fees	106
Non-Works Costs	149
Equipment Costs	6,139
Planning Contingency	34
Total	6,850
Less recoverable VAT	18
Base Project Cost	6,832

£000's	Prior Years	2026/27	Total
Capital Cost	34	6,797	6,832
Capital Funding	0	6,832	6,832

The above capital costs reflect Capital estimates prepared by the Health Boards appointed cost advisors, AECOM.

The key assumptions underlying the development of the capital costs are:

- Capital Cost includes works, non-works, abnormals allowances, equipment costs and risk contingency, which is assessed at 4.99%.
- VAT is at 20% except for the professional fee and other vat recoverable elements (see **Appendix A Estates Annexe A3**).
- VAT has been excluded from this section of the case.
- The Business as Usual option (Option 1) was retained as the baseline comparator.
- This business case excludes Optimism Bias and a Comprehensive Investment Appraisal (CIA) model.

5.3 Recurring Revenue Costs

The baseline and indicative future recurring revenue cost for the preferred option are as follows:

Figure – Revenue Implications (£000 above baseline incl non recoverable VAT)

Costings (NB. pay based on top of scale 2026/27 pay scales)	26/27	27/28	28/29	29/30	30/31
5th Linacc					
Pay Costs - Medical Physics	69	476	508	508	508
Pay Costs - Radiotherapy	0	899	899	899	899
Pay Costs - Oncology Consultants	0	166	191	191	191
Total Pay Costs	69	1,541	1,598	1,598	1,598
Non Pay - Medical Physics & Radiotherapy *	0	156	310	330	330
Non Pay - New Adaptive RT	0	260	300	300	300
Total Non Pay Costs	0	415	610	630	630
Facilities Management Costs	0	34	40	40	40
Total 5th Linacc Costs	69	1,991	2,248	2,268	2,268
CT Sim **					
Pay Costs - Medical Physics	51	154	154	154	154
Pay Costs - Radiotherapy	51	163	163	163	163
Pay Costs - Oncology Consultants	0	96	96	96	96
Total Pay Costs	103	413	413	413	413
Direct Non-Pay Costs	2	68	68	68	68
Medical Physics Artificial Intelligence Software Subscription	0	25	25	25	25
Total Non Pay Costs	2	93	93	93	93
Facilities Management Costs	0	0	0	0	0
Total CT Sim Additional Capacity Costs	105	506	506	506	506
Total Cost	174	2,497	2,754	2,774	2,774

* No Service Maintenance Contract & Support costs in 1st Year due to warranty

** CT Sim costs from funded capacity of 34.5% up to capped capacity of 60%

The operational and workforce modelling underpinning the revenue implications of this Business Case considers the combined impact of introducing a 5th Linac, the implementation of adaptive radiotherapy, and the temporary reduction in treatment capacity associated with the retrofit of an existing Linac. The outputs of this modelling demonstrate that the 5th Linac will be substantially utilised from the point of clinical operation, subject to agreed operational constraints and workforce availability.

The modelling reflects current and projected treatment demand, the increased imaging and replanning activity inherent to adaptive radiotherapy delivery, and the requirement to maintain service continuity during planned periods of Linac downtime. Collectively, this confirms that the 5th Linac is essential to sustain throughput, manage transition risk, and maintain waiting time performance, rather than representing excess or contingency capacity.

For the purposes of this Business Case, the following phasing assumptions have been applied and reflected within the financial model:

- **Installation and Clinical Commissioning:** Linac installation and clinical commissioning activities are assumed to commence in Q4 2026/27, with associated non-recurrent costs reflected accordingly.
- **Workforce Training and Readiness:** Treatment radiographer training and competency development are assumed to take place in the early part of Q1 2027/28, recognising the lead-in time required for safe operation of new and adaptive radiotherapy technologies.
- **Operational Commencement:** Recurrent operational costs associated with the fifth Linac are assumed to commence in late Q1 2027/28, reflecting a phased transition from commissioning to full clinical activity.

These assumptions ensure that revenue costs are recognised only when operational benefit can be realised, thereby supporting value for money and affordability within the wider financial framework of the Business Case.

The proposed expansion of radiotherapy services, including the introduction of a 5th linear accelerator (Linac), is critically dependent on the availability of sufficient CT-Simulation (CT-Sim) and treatment planning capacity. CT-Sim is an essential prerequisite within the radiotherapy pathway, and any constraint at this stage would materially limit patient throughput, reduce the effective utilisation of Linac capacity, and undermine the delivery of anticipated clinical and operational benefits.

Approval for a second CT-Sim unit was granted in 2024. The associated CT-Sim Business Justification Case established the evidence base for the revenue requirements relating to CT-simulation that are included in request for investment. However, whilst capital funding has been secured, recurrent funding only supports 34.5% of the full operational capacity required for CT-simulation aligned to the existing four linacs. At this level of provision, CT simulation and treatment planning capacity would become a represent a critical constraint within the pathway and would be insufficient to safely and effectively support the introduction and operation of a 5th Linac.

To enable the full and sustainable utilisation of the 5thLinac, CT-Sim provision must increase to 60%, requiring additional recurrent funding. This uplift is necessary to ensure that simulation and treatment planning capacity remains aligned with treatment delivery capability, preventing extended waiting times and supporting safe clinical practice, including the introduction of adaptive radiotherapy.

The CT-Sim revenue model included within this Business Case has been updated from the original 2024 CT-Sim Business Case to reflect current assumptions and the revised programme timetable. The following updates have been incorporated:

- **Updated Pay Award Assumptions:** Staffing costs have been refreshed to reflect the 2026/27 pay award, replacing the previous assumption based on 2024/25 pay scales, ensuring that revenue estimates remain current and realistic. These should be updated to reflect any future agreed 27/28 pay award.
- **Revised Demand and Capacity Phasing:** The phasing of demand and capacity has been updated to align with the planned commissioning of the fifth Linac, in line with agreed project timelines. This includes the planned introduction of adaptive radiotherapy techniques, which

increase demand on CT-Sim and treatment planning capacity due to additional imaging, replanning, and verification activity.

- **Capacity Scope and Future Proofing:** For the purposes of this Business Case, CT-Sim operational capacity has been capped at 60% - with an initial increase to 38% in 26/27 to align capacity to demand. Any requirement for additional capacity beyond this level has been intentionally excluded and would be subject to separate consideration, aligned to future Linac expansion and/or the introduction of additional adaptive radiotherapy systems beyond machines 1 and 2. This case includes adaptive radiotherapy capability for two Linacs (one retrofit to an existing machine and one new installation).

These assumptions ensure that the revenue model is proportionate to the scope of the current proposal, deliverable within the planned timeframe, and avoids pre-emptive investment ahead of confirmed service expansion.

The recurrent revenue costs associated with this proposal will be shared equally between Hywel Dda University Health Board and Swansea Bay University Health Board, reflecting patient activity across both organisations. Cost sharing will be governed through an agreed financial commissioning mechanism, ensuring equity, transparency and alignment between cross-Health Board, regional arrangements.

This approach enables equitable distribution of costs in accordance with service utilisation, while providing assurance that the ongoing revenue implications are affordable, sustainable, and underpinned by robust governance arrangements.

5.4 Impact on the Balance Sheet and Impairment

The capital funded option for the purchase of 5th Linac Accelerator and associated refurbishment work will require additional non-cash funding for recurring depreciation (AME) and non-recurring impairment (AME)

Figure – Impact on the Balance Sheet and Impairment £000s

000's	2026/27	2027/28	2028/29	2029/30	2030/31
Depreciation (AME)		644	644	644	644
Impairment Initial Valuation (AME)	347				

The Health Board will engage the services of the District Valuer to provide a valuation of the scheme following completion, the final value attributed to the buildings will be on the Balance Sheet of the Health Board.

At this stage the estimated AME Impairment on the initial valuation of £0.347m will need to be taken through the Health Board's SOCNE in 2026/27. The Health Board would require funding from WGov and this will be included in the AME impairment funding submission to WGov in 2026/27.

The Health Board will require additional recurring depreciation of £0.644m from 2027/28.

A process of external audit for the project has already begun and will continue throughout the redevelopment and construction process.

5.5 Overall Affordability

The Health Board will require a capital investment of £6.832m (including recoverable VAT), alongside annual revenue expenditure of £2.8m (including VAT). This ongoing revenue cost will be shared equally between Hywel Dda University Health Board and Swansea Bay University Health Board.

6 The Management Case

6.1 Introduction

The section of the business case addresses the achievability of the project. The details are set out below.

6.2 Project Management Arrangements

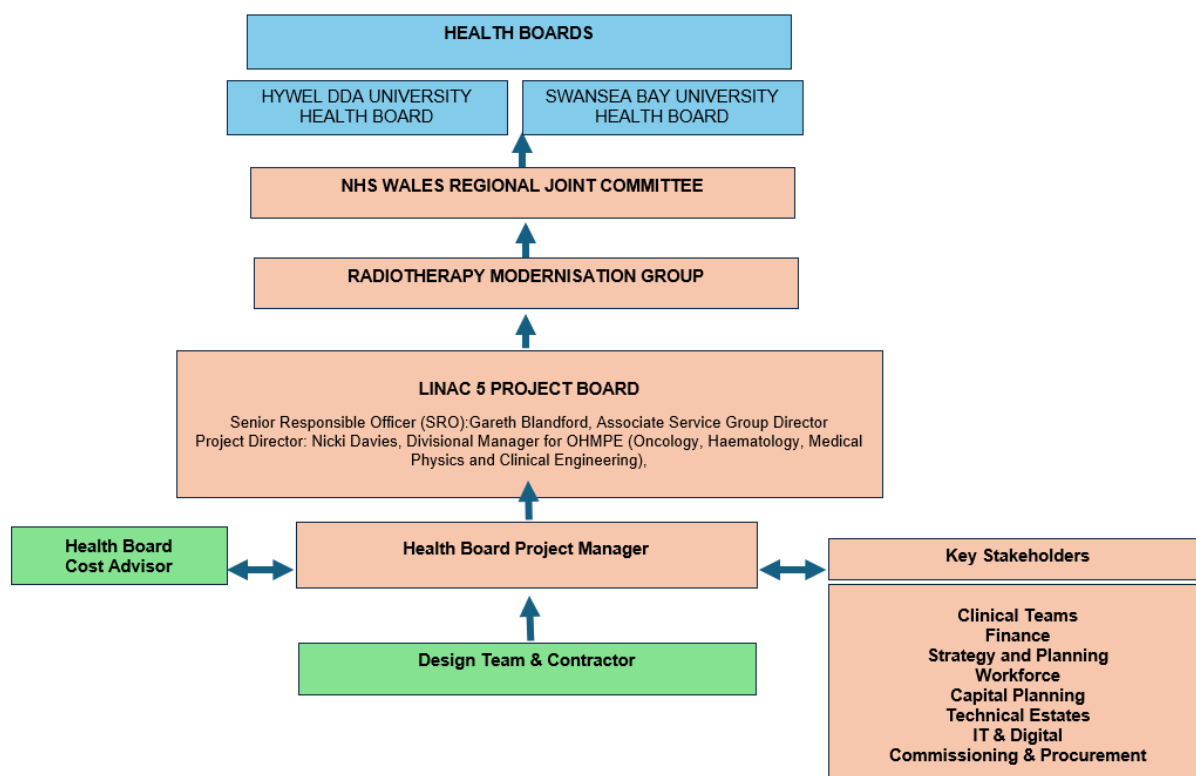
To ensure successful South West Wales project delivery, a robust project management reporting structure has been established. The structure is based on the PRINCE2 principles.

The Health Board's experience of developing and delivering complex projects in a Prince2 environment ensures diligent management and thorough clinical involvement throughout all parts of the development:

- The Senior Responsible Owner (SRO) for the project is Gareth Blandford, Associate Service Group Director, Neath Port Talbot and Singleton Service Group
- The Project Director is Nicki Davies, Divisional Manager for OHMPE (Oncology, Haematology, Medical Physics and Clinical Engineering), Neath Port Talbot and Singleton Service Group who has the authority and responsibility to manage delivery of the project on behalf of the key stakeholders. The Project Director reports via the Project Board to the SRO.
- The Project Manager, Danny Flynn, Capital Project Manager, will support the Project Director.

A summary Project Board & Project level management structure diagram is shown below for the Additional 5th Linac at Singleton Hospital.

Figure – Management Structure



6.3 Stakeholder Involvement

The key stakeholders involved in the development of this project and/or its future delivery are outlined within the Terms of Reference Appendix B.

6.4 Use of Special Advisers

Special Advisers will be appointed in accordance with the *Treasury Guidance: Use of Special Advisers*.

Figure – Special Advisers

Role	Advisor
Cost Advisor	AECOM
VAT Advisor	Ernst and Young

6.5 Project Bank Account

Project Bank Account requirements are typically assessed where construction works exceed £2m, as the works cost for this scheme falls below this threshold and the contract duration is less than 6 months, implementation is not considered necessary, in accordance with section 3.2 of the Welsh Public Procurement Policy Note (WPPN) 03/21.

6.6 AEDET (Achieving Excellence Design Evaluation Toolkit)

Due to the nature and scope of the proposed works, it was agreed in consultation with NWSSP-SES Colleagues that an AEDET assessment was not required on this occasion.

6.7 Building Research Establishment's Environmental Assessment Method (BREEAM)

As the proposed development is below 1,000m², the requirement to achieve BREEAM certification does not apply.

6.8 Planning Permissions and Statutory Approvals

The Health Board and appointed external consultants have undertaken engagement with relevant stakeholders, where appropriate, throughout the development of the scheme. As the project is limited to the refurbishment of existing accommodation and does not involve any material alteration to the building fabric or use, formal planning permission and statutory approvals have not been required at this stage.

No additional design development enhancements have been incorporated within the scope of the scheme, as such improvements would necessitate far more extensive refiguration works beyond the scope of the project. In the event that any approvals are subsequently identified these will be progressed following the appointment of the contractor, with all associated pre and post construction conditions managed accordingly.

6.9 Decarbonisation

The design does not incorporate specific decarbonisation measures; however, the scheme adopts a low-intervention approach, retaining existing walls, linings and building systems wherever possible. The air handling units intended to serve the new Linac were commissioned in 2022 and remain in good condition, supporting ongoing energy efficiency. Further efficiencies are achieved through the introduction of LED lighting. Finishes have been carefully selected to align with the existing building fabric, minimising material usage, limiting scope change and reducing overall design complexity.

6.10 Benefits Realisation

Please see SMART benefits in the detailed Benefits Realisation Register in **Appendix C**.

6.11 Community Benefits & Social Values

The proposed contractor has been asked (under the tender process) to produce project specific community benefits and social value (encompassing e.g. the well-being of the local community, inclusivity and equality, support of the Foundational Economy, and environmental impact of the project) plans, which align with the Wellbeing and Future Generations Act's requirements upon contract award.

6.12 Arrangements for Risk Management

A risk framework has been established which outlines the process for managing risk associated with developing this project, including a structure for identifying and mitigating operational and construction related risks. The risk register would use qualitative and quantitative measures to calculate the overall level of risk according to likelihood of any risk occurrence multiplied by the potential impact. The Steering Board will formally review the risk register at key stages of the project. A costed project risk register is attached at **Appendix A Estates Annexe A8**. Risks that score above 15 are automatically reported to the Project Board via the Highlight Report.

6.13 Audit & Assurance

Internal: A Health Board Integrated Impact Assessment (IIA) has been completed - see **Appendix I**.

External: A Risk Potential Assessments (RPA) has been carried out for this project. A copy is included in **Appendix H**. A Gateway review could be arranged, and Welsh Government would conduct post-submission of this BJC in accordance with Welsh Government Investment Guidance and as proportionate to this investment;

In accordance with the NHS Wales Infrastructure Investment Guidance (2018), the Health Board has sought input from NWSSP Audit and Assurance Services (Specialist Services Unit - NWSSP: A&A (SSu)) to "assess the risk profile of the scheme and provide appropriate levels of review", as required. A fully resourced and costed audit plan has provisionally been developed, and fees appropriate to the scale of this investment, its proposed timeline for delivery and level of complexity are included in the Cost Form in **Estates Annexe - Appendix A2**. The plan is detailed in **Estates Annexe - Appendix A4**.

6.14 NHS Wales Gateway Assurance

A Risk Potential Assessments (RPA) has been carried out for this project. A copy is included in **Appendix H**. An Investment Decision (Stage 3) Gateway review could be arranged with WGov prior to submission of this business case to WGov in accordance with WGov Investment Guidance. Further Gateways could be completed according to Office of Government Commerce (OGC) guidelines following further evaluation, as required.

6.15 Project Arrangements / Lessons Learned

Post evaluations and lessons learned will be undertaken as appropriate to this investment, and in accordance with best practice and NHS guidance.

6.16 Contingency Plans

The Health Board identified two major categories of project failure: Failure to achieve business case approval to deliver the scheme; Failure of the main contractor/main supplier to deliver the Linac facility/equipment to quality and time.

The contingency plan for the project in the event of failure to achieve business case approval is for the Health Board to continue to revise its plans, working with WGov for an investment in a Linac Accelerator that is acceptable. In the event of main contractor failure, SBUHB would seek recompense in line with the agreed contractual arrangements and appoint another contractor/developer to complete the project.

Appendix A Estates Annexe A2 - Costs Forms & Equipment schedule

Appendix A Estates Annexe A3 - VAT Advice

Appendix A Estates Annexe A4 - Audit Plan

Appendix A Estates Annexe A5 - Drawings

Appendix A Estates Annexe A6 - Indicative Programme

Appendix A Estates Annexe A7 – Risk Register

Appendix A Estates Annexe A8 – Costed Risk Register – *to follow*

Appendix B - Terms of Reference

Appendix C - Benefits Realisation Register

Appendix D - Framework Option Appraisal

Appendix E – Spend Objectives

Appendix F – Framework Workshops

Appendix G – Project Execution Plan (PEP) – to follow

Appendix H – Risk Potential Impact Assessment (RPA)

Appendix I - Integrated Impact Assessment (IIA)

Appendix J - Workforce Plan

Appendix K – Quality Impact Assessment (QIA)

Appendix L: Radiotherapy Monthly Report – May 2026

Appendix M: Abbreviations

AEDET	Achieving Excellence Design Evaluation Toolkit	IMTP	Integrated Medium Term Plan
AME	Annually Managed Expenditure	MDT	Multi-Disciplinary Team
BAU	Business as Usual	NCRBs	Non Cash Releasing Benefits
BIS	Business Innovation and Skills (Firm Price Index) Tender Price Index of Public Sector Building Non-Housing	NEC	New Engineering Contract
PUBSEC		NICE	The National Institute for Health and Care Excellence
BREEAM	Building Research Establishment Environmental Assessment	NWSSP	NHS Wales Shared Services Partnership
CIA	Comprehensive Investment Appraisal	SES	– Specialist Estates Services
CRBs	Cash Releasing Benefits	OBC	Outline Business Case
CSF	Critical Success Factor	OCP	Organisational Change Policy
CSP	(SB UHB's) Clinical Service Plan	OGC	Office of Government Commerce
CSS	Clinical Support Services	OOHs	Out of Hours
DECAG	Departmental Cost Allowance Guide	PEP	Project Execution Plan
DGH	District General Hospital	PET	Positron Emission Tomography
DGM	Divisional General Manager	PIA	Privacy Impact Assessment
DoH	Department of Health	PPE	Post Project Evaluation
ECAG	Equipment Cost Allowance Guide	QA	Quality Assurance
EQA	External Quality Assessment	RIBA	Royal Institute of British Architects
FBC	Full Business Case	RPA	Risk Potential Assessment
HB	Health Board	SB UHB	Swansea Bay University Health Board
HBCA	Health Board Cost Adviser	SDCP	Site Development Control Plan
HBPM	Health Board Project Manager	VfM	Value for Money
HDU	High Dependency Unit	WGov	Welsh Government
HDUHB	Hywel Dda University Health Board	(W)HBN	Welsh Health Building Note
HIA	Health Impact Assessment	(W)HTM	Welsh Health Technical Memorandum
HMT	Her Majesty's Treasury	WTE	Whole Time Equivalent