| | | | |
|---|---|---|---|
| **Meeting Date** | **28 January 2021** | **Agenda Item** | **3.7** |
| **Report Title** | Replacement of Linear Accelerator C at the South Wales Cancer Centre, Swansea | | |
| **Report Author** | Heather Edwards - Business Planning Manager (Strategy (Capital)) | | |
| **Report Sponsor** | Siân Harrop-Griffiths - Director of Strategy | | |
| **Presented by** | Siân Harrop-Griffiths, Director of Strategy | | |
| **Freedom of Information** | Open | | |
| **Purpose of the Report** | The Health Board is seeking approval for capital funding from the Welsh Government (WGov) to replace Linear Accelerator C (Lin C) within the South West Wales Cancer Centre at Singleton Hospital. This machine is now working well past its expected working life and the Health Board is seeking to replace it with a modern equivalent and the associated supporting infrastructure. This replacement is part of a planned series of replacements.<br><br>This paper seeks Health Board approval to submit the Business Justification Case (BJC). | | |
| **Key Issues** | The timely replacement of this machine will ensure that patients receiving Radiotherapy treatment, will have seamless access to the most modern and up to date technology and appropriate Radiotherapy treatment for their needs | | |
| **Specific Action Required** ***(please choose one only)*** | **Information** | **Discussion** | **Assurance** | **Approval** |
| | ☐ | ☐ | ☐ | ☒ |
| **Recommendations** | **Members are asked to:**<br>• **NOTE:** progress to date on this scheme<br>• **NOTE:** management of the revenue costs through health board financial processes<br>• **APPROVE**: The Health Board submitting a Business Justification Case (BJC) to WGov for endorsement. | | | |

# REPLACEMENT OF LINEAR ACCELERATOR C AT THE SOUTH WALES CANCER CENTRE, SWANSEA

## 1. INTRODUCTION

The Health Board is seeking approval for capital funding from the Welsh Government (WGov) to replace Linear Accelerator C (Lin C) within the South West Wales Cancer Centre at Singleton Hospital. This machine is now working well past its expected working life and the Health Board is seeking to replace it with a modern equivalent and the associated supporting infrastructure.

## 2. BACKGROUND

The current machine was installed in December 2006, is now working well past its expected working life and is unmatched to any other machine in the cancer centre. Any patient treated on Lin C is therefore at risk of having treatment interrupted due to any unplanned machine downtime. It is not clinically acceptable or feasible to significantly extend the life of a Linear Accelerator that is over 10 years old.

The Health Board cannot replace two machines at the same time, as this would significantly impact on service delivery radiotherapy treatments. The last replacement Linear Accelerator (Lin B's) clinical commissioning is near completion. The de-commissioning and replacement of Lin C is planned to 'dove-tail' with the operational status of replacement Lin B.

The procurement of this replacement Linear Accelerator will:

- Ensure that patients are receiving Radiotherapy treatment, which utilises the most modern and up to date technology, receive the most appropriate Radiotherapy treatment for their needs;
- Improve reliability, resulting in less disruption for patients during their treatment;
- Assist the Health Board in complying with the National Cancer Standards and relevant waiting times, and;
- Provide more complex treatments, contributing to the South West Wales Cancer Centre's provision of world class healthcare.

This replacement is part of a planned series of replacements as follows:

| Planned Equipment Replacement | Brief Description | Current Status |
|---|---|---|
| Lin Acc A replacement | Radiotherapy treatment machine | Replaced 2018 |
| Lin Acc B replacement | Radiotherapy treatment machine | Replaced 2019 |
| CT Simulator | Replace old CT simulator (used for planning radiotherapy treatment) | Replaced 2020 |
| Lin Acc C replacement | Radiotherapy treatment machine | Planning stage – replace 2021 |

| Planned Equipment Replacement | Brief Description | Current Status |
|---|---|---|
| Lin Acc D replacement/ MRI | Radiotherapy treatment machine | Planning stage- configuration to be confirmed - Submit business case for approval 3rd Qtr 2021 – estimated £4.5m |
| Lin Acc A replacement & Radiotherapy Treatment Planning System | Radiotherapy treatment machine & planning system | Planning stage - Submit business case for approval 2027/28 – estimated £6.5m due to planning system |
| Lin Acc E - Increase radiotherapy service to 5 Lin Accs model to meet capacity | Radiotherapy treatment machine (in 'spare' bunker) | Planning stage - Submit business case for approval 2022 estimated £4.5m-£10m (if MR Linac, would need a new bunker) |
| CT – Increase radiotherapy to 2 CTs model to meet capacity | Radiotherapy treatment machine (in current bunker) | Planning stage – Submit business case for approval 2022 estimated £2m |

Timely replacement is critical to a safe and effective service, particularly in light of a sustained Convid-19 Cancer recovery phase, and an anticipated increase in demand for Radiotherapy services. The replacement will be installed into existing bunker B, which requires updating. There will be a cost associated with refurbishment and essential engineering works to support install of the replacement machine and this is included within the business case costs.

A fully tendered Business Justification Case (BJC) has been developed and was endorsed by Senior Leadership Team in December 2020.

## 3. FINANCIAL IMPLICATIONS

The capital costs of the scheme are £4.105m (including VAT), of which £3.01m (including VAT) is equipment. The annual revenue cost impact above baseline (£000s) is as follows:

| | 20/21 | 21/22 | 22/23 | 23/24 & Ongoing |
|---|---|---|---|---|
| MPCE Staffing | 19 | 37 | 37 | 37 |
| Consultant Staffing | 0 | 12 | 12 | 12 |
| Clinical Radiographers | 0 | 37 | 37 | 37 |
| Maintenance Costs | 0 | 33 | 126 | 188 |
| **Total Costs** | **19** | **120** | **213** | **275** |
| Funding | | | | |
| ABMU (52%) | 10 | 62 | 111 | 143 |
| Hywel Dda (45 %) | 8 | 54 | 96 | 124 |
| Powys (3%) | 1 | 4 | 6 | 8 |
| **Total** | **19** | **120** | **213** | **275** |

Additional revenue costs associated with this investment will need to be managed by Swansea Bay within the overall financial plan of the Neath Port Talbot and Singleton Service Group and through appropriate contractual arrangements with Hywel Dda & Powys Health Boards.

## 4. INDICATIVE PROGRAMME

The estimated contract will be approx. 16 weeks and will cover enabling and main works and, following operational commissioning, is expected to be operational by mid-2022.

## 5. KEY RISKS

Key project and construction risks are detailed in the BJC.

## 6. RECOMMENDATIONS

Members are asked to:

- **NOTE:** progress to date on this scheme
- **NOTE:** management of the revenue costs through health board financial processes
- **APPROVE**: The Health Board submitting a Business Justification Case (BJC) to WGov for endorsement.

| Governance and Assurance | | |
|---|---|---|
| **Link to Enabling Objectives** ***(please choose)*** | **Supporting better health and wellbeing by actively promoting and empowering people to live well in resilient communities** | |
| | Partnerships for Improving Health and Wellbeing | ☒ |
| | Co-Production and Health Literacy | ☒ |
| | Digitally Enabled Health and Wellbeing | ☒ |
| | **Deliver better care through excellent health and care services achieving the outcomes that matter most to people** | |
| | Best Value Outcomes and High Quality Care | ☒ |
| | Partnerships for Care | ☒ |
| | Excellent Staff | ☒ |
| | Digitally Enabled Care | ☒ |
| | Outstanding Research, Innovation, Education and Learning | ☒ |
| **Health and Care Standards** | | |
| ***(please choose)*** | Staying Healthy | ☒ |
| | Safe Care | ☒ |
| | Effective Care | ☒ |
| | Dignified Care | ☒ |
| | Timely Care | ☒ |
| | Individual Care | ☒ |
| | Staff and Resources | ☒ |

**Quality, Safety and Patient Experience**

Key benefits include:

- Improved patient outcomes, meeting forecast changes in demand and delivering care that is more suitable for their needs.
- A more reliable Lin Acc machine, which eliminates disruption for patients during their treatment.
- Access to a modern third Lin Acc with high resolution MLC, and CBCT and complex treatment capability (e.g. VMAT), without which the current service will be highly vulnerable. This third modern accelerator reduces risk and would give certainty in treating cancers accurately and provides the ability to start certain patients' treatment if an accelerator were not available due to scheduled quality control or maintenance.
- The clinical introduction of Flattening Filter Free (FFF) treatments will deliver the radiation much quicker, this is important for gated treatments and Stereotactic type treatments, reducing the patient motion
- Allowing a greater flow of more complex cancer patients.
- Improvements in referral-to-treatment times by replacing equipment that is at the end of its useful life
- Surface Guided Radiotherapy on two matched Lin Accs will potentially allow the centre to move to a tattoo less system for patients thereby significantly enhancing patient experience
- SGRT will also enable an increased range of 4D and / or gated treatments. This is critically important in treatments with moving targets (e.g. Lung, etc.)
- Enabling patients in South West Wales with the highest health needs to have access to modern high quality targeted cancer treatments including Stereotactic Ablative Radiotherapy (SABR) as recommended by NICE guidelines. This will

address regional inequalities across Wales putting the SWWCC in line with other Cancer Centres in Wales.
- Improved access to more complex cancer treatments to the population of South West Wales.
- Avoiding health complications from some types of treatment.

**Financial Implications**

The capital costs of the scheme are £4.105m (including VAT).
Additional revenue costs associated with this investment will be managed by SBUHB, Hywel Dda & Powys Health Boards.

**Legal Implications (including equality and diversity assessment)**

None

**Staffing Implications**

None

**Long Term Implications (including the impact of the Well-being of Future Generations (Wales) Act 2015)**

This scheme lends itself in its entirety to "The Well-being of Future Generations (Wales) Act 2015, 5 ways of working.

- **Long Term** - People continue to receive modern and safer and more acceptable Radiotherapy treatment closer to home.
- **Prevention** Complying with National Cancer Standards and CR UK targets and avoiding health complications from some types of treatment.
- **Integration** Providing a range of cancer diagnostic and treatment services within the SWWCC.
- **Collaboration** Cancer diagnostic and treatment services working together within the SWWCC
- **Involvement** Involves clinicians.

| | |
|---|---|
| **Report History** | None |
| **Appendices** | Appendix 1 ~ BJC and Appendices |

# Business Justification Case

# Replacement of Linear Accelerator C into Bunker B at the South Wales Cancer Centre, Swansea


v. Final

## Document control sheet

| | |
|---|---|
| Client | Swansea Bay University Health Board |
| Document Title | Replacement of Linear Accelerator C into Bunker B at the South Wales Cancer Centre, Swansea |
| Version | Final |
| Status | Final |
| Reference | |
| Author | Heather Edwards |
| Date | 14th Dec. 2020 |
| Further copies from | **email:** heather.edwards2@wales.nhs.uk **quoting reference and author** |

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## Figures



## Appendices

# 1 Purpose

## 1.1 Introduction

The purpose of this Business Justification Case (BJC) is to seek approval for capital funding from the Welsh Government (WGov) for Swansea Bay University Health Board (SBUHB) to replace Linear Accelerator C (Lin C) within the South West Wales Cancer Centre at Singleton Hospital.

This machine is now working well past its expected working life and the Health Board is seeking an investment of £4.105m (inclusive of VAT) to replace it with a modern equivalent and the associated supporting infrastructure.

This replacement is part of a planned series of replacements. The current machine now is unmatched to any other machine in the cancer centre and any patient treated on that machine is therefore at risk of having treatment interrupted due to any unplanned machine downtime. Timey replacement is critical to a safe and effective service, particularly in light of a sustained Convid-19 Cancer recovery phase, and an anticipated increase in demand for Radiotherapy services. The replacement will be installed into existing bunker B, which requires updating. There will be a cost associated with this refurbishment and essential engineering works.

The procurement of this replacement Lin C will:

- Ensure that patients are receiving Radiotherapy treatment, which utilises the most modern and up to date technology, receive the most appropriate Radiotherapy treatment for their needs;
- Improve the reliability, resulting in less disruption for patients during their treatment;
- Assist SBUHB in complying with the National Cancer Standards and relevant waiting times, and;
- Provide more complex treatments, contributing to the South West Wales Cancer Centre's provision of world class healthcare.

Additional revenue costs associated with this investment will be managed by SBUHB, Hywel Dda & Powys Health Boards.

It is recommended on this basis that the WGov supports the investment proposals set out in this business case.

Signed:

Date:

Senior Responsible Owner

# 2 Strategic Context

## 2.1 Introduction

This section outlines the strategic context for the replacement of Lin C in the South West Wales Cancer Centre at Singleton Hospital.

One of three in Wales, the South West Wales Cancer Centre is located within Singleton Hospital in Swansea and provides the majority of non-surgical Cancer Services within South West Wales.

Radiotherapy remains a key component of curative (radical) and palliative cancer treatment and its use is increasing internationally in Cancer Centres. It now forms a key component of treatment being used either alone, or in combination with other modalities in approximately 40% of all radical treatments, although access rates remain significantly lower than this in Wales and elsewhere in the UK[1].

Lin Accs deliver 100% of radiotherapy here in Swansea, and 70-80% of machine capacity is devoted to curative treatment. Within the South West Wales Cancer Centre there a steady increase cases p.a. - there is no suggestion that locally this trend will be reversed, especially as a main driver is considered to be the aging population.

## 2.2 National and Local Context

This case supports best practice and aims to deliver improved patient flows and a more equitable cancer service for the population of Swansea Bay and Hywel Dda University Health Boards (UHBs), Powys Teaching Health Board (south) and the Bridgend area of Cwm Taf Morgannwg UHB.

It supports a number of national and local guidance and best practice mandatory requirements and is driven by:

- SBUHB's Clinical Services Plan 2019-2024 (2019)
- *The Regional Clinical Services Plan*, which was agreed by the South West Wales Joint Regional Planning and Delivery Committee in October 2019
- A Healthier Wales: Our Plan for Health and Social Care (2018)
- Hywel Dda University Health Board's Transforming Clinical Services (TCS) Programme
- SBUHB's Cancer Service Improvement Plan 2019 – 2024
- SBUHB's *Annual Plan* 2019/20
- SBUHB's Site Development Control Plan for Singleton Hospital
- The Wellbeing and Future Generations (Wales) Act 2015
- NICE guidance and Royal College of Radiologists best practice
- *The Cancer Delivery Plan for Wales* 2016-2020 (2016), and SBUHB's *Single Cancer Pathway Action Plan* is in place to implement the *Single Cancer Pathway*. The provision of timely access for radiotherapy and chemotherapy locally is important primarily for delivery of the Single Cancer Pathway for all patients where this is their definitive treatment, and *The South West Wales Non-Surgical Oncology Strategy*

This replacement proposal is part of a longer term planned replacement programme in SBUHB of equipment that is at, or is approaching, the end of its working life (please see **Appendix A – Detailed Replacement Programme**).

Lin A was replaced in 2018 and Lin B in 2019. Future Lin Accs and CT Replacement BJCs will give consideration to both the expansion and location of local cancer services (these BJCs are referred to later in Section 3) to support horizon scanning and/or academic/clinical research, and future collaboration between SBUHB and Hywel Dda Health Boards and Swansea University in A Regional Collaboration for Health (ARCH).

[1] Williams MV et al. Radiotherapy dose fractionation, access and waiting times in the countries of the UK in 2005. Clin Oncol (2007) 19(5):273-86.

Due to the historic flow of patients the Bridgend population (post 1st April 2019 Bridgend is now managed by Cwm Taf Morgannwg University Health Board) and following West Regional MDT working, some tumour sites for the Bridgend population, including Gynaecology and Upper Gastrointestinal (UGI) patients' pathways, continue to flow into the SWWCC for treatment rather than into the Velindre Centre.

## 2.3 Local Health Board Context

SBUHB covers a population of 390,000 within Swansea and Neath Port Talbot Local Authorities. The Health Board has a budget of approx. £1 billion and employs 12,500 staff, 70% of whom are involved in direct patient care.

SBUHB operates three acute hospital sites on the Neath Port Talbot, Singleton and Morriston Hospital sites and an Acute Mental Health Inpatient Unit at Cefn Coed Hospital, Swansea. Low Secure and Medium Secure Mental Health Units are sited at Glanryhd Hospital, Bridgend. The Health Board provides forensic mental health services for the whole of South Wales and community based mental health and learning disability services. The Health Board provides the regional non-surgical specialist services for cancer services (providing services to the whole of Hywel Dda and some of Powys), and provides tertiary services such as Burns and Plastic Surgery services for Wales and the South West of England.

Hywel Dda UHB provides health services for 384,000 people in Mid and West Wales covering Carmarthenshire, Ceredigion, Pembrokeshire and bordering counties, and has 4 major hospitals and a budget of over £947 million. Hywel Dda employs approx. 9,891 staff, 70% of whom are involved in direct patient care. The Health Board covers the second most sparsely populated health board area in Wales, 47.9% of the population in the region live in Carmarthenshire, 20.7% in Ceredigion and 31.4% in Pembrokeshire.

The South West Wales Cancer Centre also delivers services for some of the Bridgend population and South Powys Population circa 133,801 population.

SBUHB's vision is to be an excellent healthcare, teaching and research organisation for the Health Board area, and the wider region.

# 3 Case for Change

## 3.1 Business Needs

In outlining the case for investment this section will highlight the importance of maintaining the required levels of Radiotherapy service capacity. For details of the Lin Acc, CT Sim, Simulator and treatment planning facilities at the South West Wales Cancer Centre please refer to **Appendix A – Detailed Replacement Programme**.

A Lin Acc under normal working conditions, has a recommended working life of ten years from its date of entry into clinical use. Lin C's Elekta Precise machine was commissioned in December 2006, and has exceeded its recommended life, some elements of the machine are out of manufacturer support, and does not support complex technologies, e.g. image-guided radiotherapy (IGRT) using cone beam CT (CBCT) and surface guided radiotherapy (SGRT), 4D adaptive Radiotherapy, *in vivo* dosimetry, high dose-rate stereotactic ablative radiotherapy and the latest highly conformal techniques (based on 'arc therapy') for intensity-modulated radiotherapy and using high resolution radiation collimators.

Lack of capacity in complex treatment delivery protocols (e.g. VMAT), imaging techniques (e.g. IGRT) and sophisticated dosimetry increases the difficulty in directing radiation more accurately to tumours whilst minimising complications by sparing normal tissues and confirming the delivered radiation dose. This has clear quality and safety implications and prevents a proportion of patients currently being treated in the South West Wales Cancer Centre from receiving modern RT treatments that are considered "standard of care" elsewhere in the UK and from participating clinical trials. The figure (below) details radiotherapy activity at the South West Wales Cancer Centre in 2019/20 are based on those submitted to the Radiotherapy dataset:

**Figure 1 – Comparison of Activity**

| Year | Catchment Population | Fractions | Equivalent attendances | Attendances per million |
|---|---|---|---|---|
| 2019/20 | 0.87m[2] | 30,979 | 29398 | 33,791 |

## 3.2 Problem with Status Quo

The existing Lin C urgently needs replacement. It is now past the end of its working life, is unmatched and its modern replacement will require appropriate supporting facilities and infrastructure. The continued investment in modern Lin Accs within SBUHB will help to ensure the continuity of clinical treatment capacity, and ensure access to modern equipment and more complex technologies.

## 3.3 Investment Objectives

The following key investment objectives have been identified:

- **Investment Objective 1:** The replacement of Lin C will ensure radiotherapy treatment capacity is maintained at the South West Wales Cancer Centre (SWWCC). *Installation to be complete by the end of 2021 with operational commissioning complete by mid-2022.*
- **Investment Objective 2:** Improvements in the quality of service will be achieved. This will by evidenced by the following:
  - Improved patient outcomes, meeting forecast changes in demand and delivering care that is more suitable for their needs.
  - Demonstrating solutions that are flexible and robust to a range of future scenarios by fully complying with NICE guidance and Royal College of Radiologists best practice and complying with National Cancer Standards and CR UK targets.

  *To be evidenced 24 months after operational date, i.e. mid-2024.*

[2] Note, this is pre 1st April 2019's Health Board boundary changes

- **Investment Objective 3:** A more efficient service will be achieved. This will be evidenced by the following:
  - Improvements in clinical service efficiency.
  - A more reliable Lin Acc machine, which eliminates disruption for patients during their treatment.
  - Access to a modern third Lin Acc with high resolution MLC, and CBCT and complex treatment capability (e.g. VMAT), without which the current service will be highly vulnerable. This third modern accelerator reduces risk and would give certainty in treating cancers accurately and provides the ability to start certain patients' treatment if an accelerator were not available due to scheduled quality control or maintenance.
  - The clinical introduction of Flattening Filter Free (FFF) treatments will deliver the radiation much quicker, this is important for gated treatments and Stereotactic type treatments, reducing the patient motion
  - Allowing a greater flow of more complex cancer patients.
  - Improvements in referral-to-treatment times by replacing equipment that is at the end of its useful life

  *To be evidenced 24 months after operational date, i.e. mid-2024.*

- **Investment Objective 4:** Improved access to more complex cancer treatments for cancer patients will be achieved. This will by evidenced by the following:
  - Improved access to more complex cancer treatments to the population of South West Wales.
  - Surface Guided Radiotherapy on two matched Lin Accs will potentially allow the centre to move to a tattoo less system for patients thereby significantly enhancing patient experience
  - SGRT will also enable an increased range of 4D and / or gated treatments. This is critically important in treatments with moving targets (e.g. Lung, etc.)
  - Enabling patients in South West Wales with the highest health needs to have access to modern high quality targeted cancer treatments including Stereotactic Ablative Radiotherapy (SABR) as recommended by NICE guidelines. This will address regional inequalities across Wales putting the SWWCC in line with other Cancer Centres in Wales.

  *To be evidenced 12 months after operational date, i.e. mid-2023.*

- **Investment Objective 5:** Economies will be achieved. This will be evidenced by the following:
  - Optimising public value by making the most economic, efficient and effective use of resources, e.g. by reducing maintenance call-outs following completion of this scheme.
  - Providing the most affordable Radiotherapy radical treatment solution for cancer treatment.
  - Avoiding health complications from some types of treatment.

  *To be evidenced 12 months after operational date, i.e. mid-2023.*

## 3.4 Benefits

The main outcomes and benefits of the potential scope are detailed in **Appendix B - Investment Objectives and Benefits by Stakeholder Group** and **Appendix F – Benefits Realisation Register**.

## 3.5 Risks

The main business and service risks together with their counter measures are detailed in **Appendix C - Risk Register**.

## 3.6 Constraints and Dependencies

A number of constraints are: The replacement solution must be fit for purpose, make best use of the available development space and service infrastructure, and be delivered on a timely basis; Cancer services to patients and others must be maintained seamlessly during the works, and commissioning periods, and; Revenue resources are limited and the solution should offer value for money, support clinical needs, be affordable, be delivered within project budget. The main dependencies are: continued support for the agreed model of care, and availability of capital funding from WGov.

# 4 Available Options

## 4.1 Introduction

In accordance with the Capital Investment Manual and requirements of HM Treasury's Green Book (A Guide to Investment Appraisal in the Public Sector), this section of the business case demonstrates that the most economic advantageous option has been selected. This option best meets the service needs, realises the most benefits, and optimises Value for Money.

## 4.2 Critical Success Factors

The Critical Success Factors (CSFs) have been identified to allow evaluation of the potential options. These are shown below:

**Figure 2 – Critical Success Factors (CSFs)**

**CSF 1 Compliance** The solution must comply with NICE guidelines.
**CSF 2 Acceptability** The solution must be acceptable to users and clinicians and deliver the required cancer service to South and West Wales' population.
**CSF 3 Strategic Fit** The solution must fit with national, regional, local strategies.
**CSF 4 Achievability** The physical solution must be deliverable within the required timescale of installation complete by the end of 2021 with operational commissioning complete by mid-2022.
**CSF 5 Benefits Optimisation** The solution should assist SBUHB to make more effective use of scarce resources.
**CSF 6 Affordability** The organisation must be able to fund the capital and revenue consequences associated with the proposed investment solution and support overall financial balance.

## 4.3 The List of Options

The Appraisal Group identified a list of options for achieving the project objectives. The long list of options was generated through consultation with clinical leads and managers within the Cancer Services and Clinical Support Services Directorates within SBUHB. The evaluation of the above against the available replacement options were identified as follows:

**Figure 3 – Available Replacement Options**

| Option | Description | Finding |
|---|---|---|
| **1** | 'Do Nothing' (Status Quo) - Involves planned/statutory maintenance or minor enhancement of the existing Lin C | **Rejected** |
| **2** | Outsource to an adjacent Health Board/private sector provider | **Rejected** |
| **3** | Replace the existing Lin C in Bunker B | **Preferred Option** |

## 4.4 Reasons for Inclusion/Exclusion

The options that were excluded from further detailed evaluation are as follows:

**Option 1 – 'Business as Usual'** - Involved planned/statutory maintenance or minor enhancement of the existing Linear Accelerator C. This option was ***rejected*** for further consideration for the following reasons:

- This option was not considered financially viable.
- Lin C is 15 years old. It is not clinically acceptable or feasible to significantly extend the life of a Lin Acc this old as it could not support more complex radiation dosimetry and dose planning (these more complex techniques can only be supported on modern machines, as standard). A major component (MLC) will be out of support by the manufacturer in 2020. The machine is unmatched to any other remaining in the department.

- We advise the cost of extending the life of the current machines was difficult to quantify going forward as parts are increasingly difficult to obtain and enhancement options are impracticable and offer limited clinical benefits. Please note that as later model Lin Accs come up for replacement in SBUHB there may be opportunities to upgrade those machines. Unfortunately, this enhancement was not possible for Lin C due to its obsolete technical specification.

**Option 2** i.e. **Outsource to an adjacent Health Board/private sector provider**. This option was ***rejected*** for further consideration for the following reasons:

- It was not practicable given it was clinically and operationally unsustainable. It was unacceptable clinically and was unaffordable in revenue terms.
- Likewise, it was difficult to quantify the cost of outsourcing to another Health Board, and in any case there is no 'spare' capacity in neighbouring health boards.
- This option would also involve significant travel distances for vulnerable cancer patients who would need to travel longer distances for treatment, so it was rejected and was not fully costed.

**Option 3** i.e. **Replace existing Lin C** was confirmed as the preferred option as this is the only acceptable, viable and clinically safe option, and its replacement supports SBUHB's clinical strategy:

- This option was considered the most favourable as it allowed us to replace a standard Lin Acc in line with the planned All Wales replacement equipment schedule.
- Choice of the replacement machine was agreed following consultation with our clinical team and with NWSSP-Procurement diagnostic equipment advisors.
- We note that the equipment choices for this case were limited to meeting clinical need.

## 4.5 The Preferred Solution

The preferred solution is Option 3, i.e. replace the existing Lin C in Bunker B in the SWWCC at Singleton Hospital.

## 4.6 Capital Costs

The capital costs (excluding VAT) are as follows:

**Figure 4 – Estimated Capital costs for Option 3 (excl VAT)**

| | **Option 3 (£ excl. VAT)** |
|---|---|
| Works costs | 364 |
| Fees | 107 |
| Non-works costs | 41 |
| Equipment costs | 2,692 |
| Planning contingency | 160 |
| **Total project cost** | **3,364** |

Please refer to **Appendix D – Preferred Option Cost Form** for detailed capital costs**.**

## 4.7 Revenue Costs

The additional revenue costs above baseline for the preferred option are outlined in the figure below:

**Figure 5 – Annual Revenue cost impact of Option 3 above baseline (£000's)**

| | 20/21 | 21/22 | 22/23 | 23/24 & Ongoing |
|---|---|---|---|---|
| MPCE Staffing | 19 | 37 | 37 | 37 |
| Consultant Staffing | 0 | 12 | 12 | 12 |
| Clinical Radiographers | 0 | 37 | 37 | 37 |
| Maintenance Costs | 0 | 33 | 126 | 188 |
| **Total Costs** | **19** | **120** | **213** | **275** |
| Funding | | | | |
| ABMU (52%) | 10 | 62 | 111 | 143 |
| Hywel Dda (45 %) | 8 | 54 | 96 | 124 |
| Powys (3%) | 1 | 4 | 6 | 8 |
| **Total** | **19** | **120** | **213** | **275** |

The revenue costings include the following assumptions: Costed at 2020/21 prices.

Maintenance contract costs will only be incurred from part-way through 22/23 onwards as the outright purchase will include a 2 year warranty period.

Other maintenance not included under the Linacc maintenance contract will be incurred from part-way through 21/22, benefiting from a 1 year warranty period.

Given only one option has been taken forward further detailed economic appraisal has not been included.

## 4.8 Capital Risk

The key risks associated with the scheme have been assessed by an independent Cost Advisor in a workshop in July 2020 using WGov guidance methodology for business cases.

Please see **Appendix C - Risk Register** for a detailed analysis of the operational and construction risks.

# 5 Procurement Route

## 5.1 Introduction

This section of the business case sets out the how this scheme will be procured.

## 5.2 Procurement Strategy and Route

The local Engineering and Enabling works elements will be managed via SBUHB's Local Contractor and Consultant Framework.

The supplier for some elements (e.g. the Lin Acc, Surface Guided Radiotherapy equipment) will be selected using the All Wales Procurement Framework Commissioning to ensure the interim modular solution achieves appropriate Environmental, Health and Safety, Fire Safety, Equality Act, and service requirements.

## 5.3 Essential Services

The essential requirements to be provided as part of this contract are:

- The development of a replacement Lin Acc C solution for the SWWCC;
- A transition process to ensure cancer services are not disrupted during main works and commissioning stages, and;
- The operational commissioning of the new equipment to realise the organisational benefits of the scheme.
- The Design Team will be required to ensure compliance with clinical and IM&T requirements so as to ensure compatibility with other integrated systems.

## 5.4 Key Appointments

The following key appointments have been made:

- FP Hurleys & Sons will supply the construction and supply chain services.
- Project Manager Services, Architectural & Principal Design services are provided by Stride Treglown.
- Health Board Cost Planning services and business case support services are provided by AECOM.
- Structural Engineering design services are tbc.
- Mechanical & Electrical design services are provided by AECOM.
- Construction and other technical commissioning services are provided by SBUHB.

## 5.5 Agreed Risk Transfer and Management

### Risk Transfer

The Health Board considers the allocation of risk at this stage to be acceptable and has allocated risk between parties as follows:

**Figure 6 – Risk transfer**

| Risk Category | Potential Allocation | |
|---|---|---|
| | Public | Private |
| 1. Design Risk | ✔ | |
| 2. Services, Construction & Development Risk | | ✔ |
| 3. Transition & Implementation Risk | ✔ | |
| 4. Availability and Performance Risk | | ✔ |
| 5. Operating risk | ✔ | |
| 6. Variability of Revenue Risks | ✔ | |
| 7. Termination Risks | ✔ | |

| Risk Category | Potential Allocation | |
|---|---|---|
| | Public | Private |
| 8. Technology & Obsolescence Risks | ✔ | |
| 9. Control Risks | ✔ | |
| 10. Residual Value Risks | ✔ | |
| 11. Financing Risks | ✔ | |
| 12. Legislative Risks | ✔ | |
| 13. Other Project Risks | ✔ | |

### Risk Management

The risk register has been compiled and costed relative to risks that apply over the whole of the project lifecycle. The risk register will be maintained by the Health Board Project Liaison Manager in consultation with the Health Board's Cost Advisor during the works phase of the project, through to hand over and operational commissioning. It is planned to review the risk register regularly and update accordingly to maintain tight financial cost control relative to the risks noted in the register. The Project Director will report to the Project Board.

SBUHB's Cancer Services management will manage the change process and will endeavour to mitigate any risk of disruption to cancer services and performance during the transition phase.

The planning contingency has been assessed by an independent Cost Advisor in consultation with the Health Board Project Liaison Manager (who has expertise in delivering similar projects). The planning contingency sum of £191,885 (including VAT) is a robust assessment of risk and complies with NWSSP - FS guidance.

## 5.6 Agreed Charging Mechanisms

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

AECOM, the Health Board's appointed Cost Advisor, confirms this scheme was subject to a full tender process.

The contractor will invoice SBUHB 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.

The contract will be let under the NEC 3 Option A.

## 5.7 Estimated Contract Length

The estimated contract will be approx. 16 weeks and will cover enabling and main works and, following operational commissioning, is expected to be operational by mid-2022.

## 5.8 Personnel Implications (Including TUPE)

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

## 5.9 Implementation Timescales

The implementation milestones are set out below:

**Figure 7 – Key indicative milestones**

| Milestone Activity | Date |
|---|---|
| Project Board and Singleton Hospital's Management Board sign off the BJC | December 2020 |
| SBUHB's Senior Leadership Team and Health Board endorse the BJC | December 2020 |
| Submission of BJC to WGov for approval | December 2020 |
| Anticipated WGov approval of BJC | April 2021 |
| Equipment order placed with Preferred Supplier | April 2021 |
| Mobilisation on site and removal of existing equipment, subject to contractor's programme | April 2021 |
| Construction / Enabling Works Commence | May 2021 |
| Complete Construction / Installation | September 2021 |
| Clinical Commissioning commence | October 2022 |
| Operational | March 2022 |
| Technical PPE | June 2022 |

Please refer to **Appendix E – Indicative Programme**.

## 5.10 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.

# 6 Funding and Affordability

## 6.1 Introduction

The purpose of this section is to set out the financial implications of the contracted solution.

## 6.2 Capital Requirements

The capital costs of the scheme are £4.105m (including VAT). The Health Board has received advice from its external VAT advisors that the scope for recovering VAT on the external fees is 100%. These have been factored into the cost forms (**Appendix D - Preferred Option Cost Form**).

**Figure 8 – Capital Expenditure £000's (incl of VAT)**

| £(000's) | prior years | 20/21 | 21/22 | Total |
|---|---|---|---|---|
| Capital Costs | 46 | 10 | 3,960 | 4,016 |
| **Capital Funding** | | | **4,016** | **4,016** |

## 6.3 Impact on the Statement of Comprehensive Net Expenditure

The revenue impact of the scheme on the Health Board's Operating Cost Statement is shown below:

**Figure 9 – Revenue Expenditure £000's**

| £(000's) | 20/21 | 21/22 | 22/23 | 23/24 | 24/25 |
|---|---|---|---|---|---|
| Recurrent Revenue | 19 | 120 | 213 | 275 | 277 |
| **Non-Cash Estimates** | | | | | |
| Depreciation | | 175 | 350 | 350 | 350 |
| Impairment (AME) Initial Valuation | | 500 | | | |

### Capital and Revenue Assumptions

Capital Cost forms include a breakdown of works and non-works elements, and identify new equipment costs. Where Health Board in-house fees would usually have been outsourced these fees have not been charged against revenue. A VAT rate of 20% has been reflected in the capital costs.

## 6.4 Impact on the Balance Sheet and Impairment

The Health Board will engage the services of the District Valuer to provide a valuation of the scheme following completion. This scheme would result in an estimated AME Impairment of £500k on the initial valuation of the unit and this will need to be taken through the Health Board's SOCNE in 2021/22. The Health Board would require funding from WGov and this will be included in the AME impairment funding submission to WGov in 2021/22.

The Health Board will require additional recurring depreciation of £350k from 2022/23.

## 6.5 Overall Affordability

The project requests capital investment 'not to exceed' £4.105m (including VAT) to be allocated by the WGov.

There is a net increase in recurrent revenue costs of £275k per annum as from 23/24. The increase in costs up to year 4 relate to costs that would be covered under warranty in years 1 and 2, which straddle the first 3 financial years. The additional non-recurring & recurring costs will be managed by SBUHB, Hywel Dda & Powys Health Boards.

The Health Board requests AME Impairment funding of £500k in 2021/22 and funding to support recurrent depreciation costs of £350k from 2022/23.

# 7 Management Arrangements

## 7.1 Introduction

The section details the plans for the successful delivery of the scheme to cost, time and quality. The details are set out below.

## 7.2 Project Management Arrangements

To ensure successful project delivery a robust project management reporting structure has been established. The structure is based on the Prince2 principles, with key members of the project team trained in Prince2 methodology. 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 structure has been developed in order to have the shortest possible reporting lines while ensuring that there is a sufficient capacity and processes in place to control the delivery of the project.

There is a Senior Responsible Owner and a Project Director with the authority and responsibility to manage delivery of the project. The Project Director is supported by a Health Board Project Liaison Manager who will deliver the project.

The contractual framework that has been adopted for this project will ensure that project structures are robust from the outset and that the parties have agreed the contractual approach to be adopted between them.

The Health Board has ownership of the project at the highest level to ensure that objectives of the project are met. The primary objectives of the project are to ensure:

- The operational commissioning of the new equipment to realise the organisational benefits of the scheme.
- That works and enabling phases are achieved on time, and in accordance with the design brief;
- The transition process ensures that cancer services are not disrupted, and;
- Operational commissioning of the new equipment realises the organisational benefits of the scheme.

### Project Reporting Structure

The project will continue to be managed under the structure outlined above, i.e. with a Project Director, Health Board Project Liaison Manager, and user group, with key responsibilities for managing all areas of design, works and equipment installation, service planning and facilities management.

The Project Director will report via the Project Board to the Project Sponsor.

The Cost Advisor will report regularly to the Health Board Project Liaison Manager.

## 7.3 Project Roles and Responsibilities

Mrs Jan Worthing, Group Director Singleton & Neath Port Talbot Hospitals, SBUHB is the Senior Responsible Officer (SRO) and is accountable to the Health Board for the successful delivery of the project.

The Project Director is Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB.

The Project Director is supported by a Health Board Project Liaison Manager, Mr Danny Flynn, Capital Project Manager, who will be responsible for the day-to-day management and delivery of the project.

## 7.4 Use of Special Advisers

Special Advisors have been used in a timely and cost-effective manner in accordance with the Treasury Guidance: Use of Special Advisers.

Details of special advisers are provided below:

**Figure 10 – Special Advisers**

| Specialist Area | Adviser |
|---|---|
| Health Board Cost Adviser | AECOM |
| VAT adviser | Tim Glover, Ernst & Young |

## 7.5 Arrangements for Change and Contract Management

### Contract Management

The Health Board has developed a strategy for dealing with change and contract management. Both as a contractual obligation and as an integral part of the good practice, change management plays a key role in the directing and controlling activities of project management.

The Change Control mechanism classifies change proposals as normal, mandatory, or urgent and describes the different processing and approval requirements based on their classification and on the source of the request, be it Health Board, NHS Wales, or contractor. In summary, the Change Control process ensures that:

- Proposed changes to the facility or contract are captured, carefully considered and assessed for impact
- Approved change requests are managed and implemented consistently across the project, avoiding unauthorised and conflicting changes.
- All NHS derived Notices of Change are assessed and managed in accordance with any applicable contractual requirements.
- Changes are funded appropriately.

### Change Management Arrangements

The scope of the project enables arrangements for change management to be considered as part of normal operational management procedures.

The Project Director must approve all changes to the Schedule of Accommodation (SOA). Once the detailed design has commenced the project user group may identify changes to drawing proposals during the iteration process. However any change that may ultimately increase the SOA is subject to the approved Change Management Process in the Project Execution Plan.

The Contractor must only develop design for signed off/extant versions.

### Arrangements for Risk Management

The Health Board is required to undertake a comprehensive assessment of the risk associated with the preferred option. The risk management strategy is based upon the following principles:

- Identifying possible risks in advance, putting in place mechanisms to minimise the likelihood of risks occurring and their associated adverse effects;
- Having processes in place to ensure up to date, reliable information about risks is available, and establishing an ability to effectively monitor risks;
- Establishing the right balance of control is in place to mitigate the adverse consequences of risks, should they materialise, and;
- Setting up decision-making processes, supported by a framework of risk analysis and evaluation.

It is the Health Board Project Liaison Manager's responsibility to manage the Risk Register in co-operation with the Project Manager, Specialist Constructor and Health Board Cost Adviser.

A risk register is attached at **Appendix C – Risk Register**.

## 7.6 Contingency Plans

The Health Board can identify two major categories of project failure: failure to achieve business case approval and the failure of the supplier/contractors to deliver the scheme resulting in disruption of essential services to cancer patients.

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 to develop a solution that is acceptable.

In the event of supplier or contractor failure the organisation would seek recompense in line with the agreed contractual arrangements and appoint another supplier and or contractor to complete the project.

If this scheme is not progressed on a timely basis the Health Board will be unable to provide a sustainable or clinically acceptable cancer service to its local population.

# Appendix A – Detailed Replacement Programme

| Business Case Title | Brief Description | Current Status |
|---|---|---|
| Lin Acc A replacement | Replaced old Lin Acc radiotherapy treatment machine | Replaced 2018 |
| Lin Acc B replacement | Replaced old Lin Acc radiotherapy treatment machine | Replaced 2019 |
| CT Simulator | Replace old CT simulator (used for planning radiotherapy treatment) | Replaced 2020 |
| Lin Acc C replacement | Replace old Lin Acc radiotherapy treatment machine | Planning stage – replace 2021 |
| Lin Acc D replacement/ MRI | Replace old Lin Acc radiotherapy treatment machine | Planning stage- configuration to be confirmed - Submit business case for approval 3rd Qtr 2021 – estimated £4.5m |
| Lin Acc A replacement & Radiotherapy Treatment Planning System | Replace old Lin Acc radiotherapy treatment machine & old planning system | Planning stage - Submit business case for approval 2027/28 – estimated £6.5m due to planning system |
| Lin Acc E - Increase radiotherapy service to 5 Lin Accs model to meet capacity | Replace old Lin Acc radiotherapy treatment machine in the spare bunker | Planning stage - Submit business case for approval 2022 estimated £4.5m-£10m (if MR Linac, would need a new bunker) |
| CT – Increase radiotherapy to 2 CTs model to meet capacity | Replace old CT Simulator (Used for Planning radiotherapy treatment) in current bunker | Planning stage – Submit business case for approval 2022 estimated £2m |

# Appendix B – Investment Objectives and Benefits by Stakeholder Group

| **Investment Objective 1: The replacement of Lin Acc C will ensure radiotherapy treatment capacity is maintained at the SWWCC** |
|---|
| **Qualitative Benefits by Stakeholder Group** |
| ***Health Board/Patients***<br>· Provides new and modern equipment in a planned way.<br>· Improves the patient experience.<br>· Decreases toxicity and improves survival rates.<br>· Reduces governance risk and risks.<br>· Achieves compliance with WHTM & WHBN and best practice guidelines.<br>· Provides a clinically safer environment for staff. |
| **Investment Objective 2: Improvements in the quality of service will be achieved** |
| **Qualitative Benefits by Stakeholder Group** |
| ***Health Board/Patients***<br>· Complies with NICE guidance and Royal College of Radiologists best practice, National Cancer Standards and CR UK targets.<br>· Improves patient outcomes.<br>· Capability to deliver to more complex treatments more quickly e.g. Intensity Modulated Radiotherapy (IMRT)[3] delivered as arc therapy (VMAT), and high dose-rate (flattening filter-free) treatment.<br>· Capability to deliver treatments with Cone Beam CT (CBCT) Image Guided Radiotherapy (IGRT). CBCT greatly increases the accuracy of radiotherapy treatment by improved assessment of the target on a day-to-day basis, taking into account patient position changes, organ motion, and the filling and emptying of internal organs, as well as changes in tumour volume.<br>· Capability to utilise surface guided radiotherapy (SGRT) to ensure highly accurate patient repositioning (without additional radiation dose) and provide real-time analysis of position for 4D radiotherapy (e.g. in response to breathing).<br>· Capability to utilise Flattening Filter Free treatment modalities, to deliver the radiation in a very much reduced time.<br>· The availability of in vivo dose measurement will enable monitoring of treatment delivery to a greater number of patients with the potential to detect and correct a dose change.<br>· The additional new technology will enable the inclusion of SBUHB patients in a wider range of clinical trials.<br>· The new Lin Acc will provide technology capable of being matched our two most modern Lin Accs (A and B), to provide a more effective clinical service and optimum treatment for patients.<br>· Meets forecast changes in demand.<br>· Improved conditions for patient care due to the availability of more appropriate clinical care that meets best practice standards.<br>· Delivers more appropriate care for individual patient's needs.<br>· Provides solutions that are more flexible and robust.<br>· Makes SBUHB a more attractive employer for skilled staff.<br>· Provides a more sustainable clinical service. |
| **Investment Objective 3: A more efficient service will be achieved** |
| **Qualitative Benefits by Stakeholder Group** |
| ***Health Board /Patients***<br>· Improves clinical service efficiency.<br>· Provides a more reliable Linear Accelerator machine.<br>· Eliminates disruption for patients during their treatment.<br>· Allows a greater flow of more complex cancer patients. |

[3] *Radiotherapy: Developing a World Class Service for England. Report to Ministers from the National Radiotherapy Advisory Group (2007)*

| |
|---|
| · Improves referral-to-treatment times. |
| **Investment Objective 4:** Improved access to more complex cancer treatments for cancer patients will be achieved |
| **Qualitative Benefits by Stakeholder Group** |
| ***Health Board/Patients*** <br>· Improves access to more complex cancer treatments to the population of South West Wales. <br>· The replacement of the existing Lin C with Lin Acc technology, now available as standard, will improve the speed of radiotherapy treatment and thereby increase capacity on the new machine. <br>· Improves equity of access in line with other Cancer Centres in Wales |
| **Investment Objective 5: Economies will be achieved** |
| **Qualitative Benefits by Stakeholder Group** |
| ***Health Board*** <br>· Enable optimum use to be made of daily treatment schedules. <br>· Further facilities to detect and correct patient position and dose (SGRT, XVI and in vivo dosimetry) may help to minimise post radiation requirements for additional medical intervention. <br>· Fewer cancellations and disruption to patients, ensuring clinical availability during scheduled hours. |
| **Quantitative Benefits (resource releasing)** |
| ***Non cash releasing - Health Board/Patients*** <br>· Optimises the use of scare resources. <br>· Improves utilisation of maintenance staff and frees up time for improved service of patients. <br>· Fewer health complications for patients from some types of treatment. <br>· Most affordable Radiotherapy radical treatment solution for cancer treatment. |

# Appendix C – Risk Register

Microsoft Excel Worksheet

# Appendix D – Cost Form

Appendix D- Linacc C
BJC Cost Form rev A (

# Appendix E – Indicative Programme

Adobe Acrobat Document

# Appendix F – Benefits Realisation Register

Microsoft Word 97 - 2003 Document

| Nr | Risk Description | Risk Consequence:<br>1. Time<br>2. Cost<br>3. Quality<br>4. Operational | Scheme | Probability | Impact | Score | Risk Allocation | Category | Quantified Unquantified | Estimated cost impact £ | Management Actions | Action Owner | Review Date | Comments | Cost if it happens £ | Likelihood Factor | Expected Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.00** | **PLANNING** | | | | | | | | | | | | | | | | |
| 1.1 | | | | | | | | | | | | | | | | | |
| **2.00** | **DESIGN/CDM/REGULATIONS** | | | | | | | | | | | | | | | | |
| 2.1 | Siting and adequacy of Contractors Compound and Site Set-Up | Time, Cost, Quality | Linacc | 2 | 3 | 6 | | Financial | Unquantified | 10,000 | | Hurleys | | | 10,000 | 0.25 | 2,500 |
| 2.2 | Suitable Contractor Emergency Procedures | Quality, Operational | Linacc | 1 | 5 | 5 | | Operational | Unquantified | 5,000 | Protect Fire Mans switch on main route from damage | Hurleys | | | 5,000 | 0.05 | 250 |
| 2.3 | Unforeseen service diversion works | Time, Cost, Quality, Operational | Linacc | 3 | 3 | 9 | | Operational | Unquantified | 38,000 | IT routes and services in current area | Client | | | 38,000 | 0.50 | 19,000 |
| 2.4 | Encountering unforeseen services. | Time, Cost, Quality | Linacc | 3 | 2 | 6 | | Strategic | Unquantified | 15,000 | Shared electrical services to other areas of the building | Client | | | 15,000 | 0.50 | 7,500 |
| 2.5 | Fire strategy and detection during the works | Time, Cost, Quality, Operational | Linacc | 1 | 3 | 3 | | Strategic | Unquantified | 10,000 | Appropriate strategy during construction works to protect building and fire routes | Client | | | 10,000 | 0.05 | 500 |
| 2.6 | Asbestos in existing buildings; only to older part | Time, Cost, Quality, Operational | Linacc | 2 | 4 | 8 | | Strategic | Unquantified | 30,000 | Asbestos survey/register to be provided | Client | | Asbestos to be delt with outside the Risk register | 30,000 | 0.50 | |
| 2.7 | Contaminated Waste - Other | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Testing required if there is any suspicion of contaminants in any existing surfaces or decoration. EWN to be issued if risk manifests | Client | | | 20,000 | 0.50 | 10,000 |
| 2.8 | Vehicular/Pedestrian movements on site - proximity to public | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 10,000 | Need for clear segregation and procedures for banking etc. to be addressed | Hurleys | | | 10,000 | 0.50 | 5,000 |
| 2.9 | Extent and scope of the design to be frozen for construction phase | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 15,000 | | Client | | | 15,000 | 0.50 | 7,500 |
| 2.10 | Flaws in design assumptions | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 15,000 | Surveys will dictate any outstanding issues | Client | | | 15,000 | 0.50 | 7,500 |
| 2.11 | Impact of derogrations or design assumption | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 30,000 | Design is based on Electa machine any change would need full redesign; see BJC | Client | | | 30,000 | 0.50 | 15,000 |
| 2.12 | M&E CDP Elements limited list | Time, Cost, Quality | Linacc | 2 | 2 | 4 | | Financial | Unquantified | 8,000 | Perforamnce specification for Fire Alarms only | Hurleys | | | 8,000 | 0.25 | 2,000 |
| 2.13 | Current as built drawings do not reflect current installation | Time, Cost, Quality, Operational | Linacc | 1 | 2 | 2 | | Strategic | Unquantified | 10,000 | Surveys to be undertaken to determine extent of existing buildings | Client | | Health Board risk | 10,000 | 0.75 | |
| 2.14 | Existing infrastructure; non conformaties with currrent standards | Time, Cost, Quality, Operational | Linacc | 1 | 2 | 2 | | Strategic | Unquantified | 10,000 | Essential and non essential supplies and hot water returns | Client | | Health Board risk | 10,000 | 0.75 | |
| 2.15 | Changes to existing Health Board personnel; changes to design requirements | Time, Cost, Quality, Operational | Linacc | 2 | 2 | 4 | | Strategic | Unquantified | 15,000 | Client to inform of any potential health board changes | Client | | Health Board risk | 15,000 | 0.75 | |
| **3.00** | **M&E SPECIFIC RISK** | | | | | | | | | | | | | | | | |
| 3.1 | Existing cables may not be suitable for re use | Time, Cost, Operational | Linacc | 1 | 2 | 2 | | Strategic | Unquantified | 35,000 | Re wire only lighting and power main supply reused | Client | | | 35,000 | 0.50 | 17,500 |
| 3.2 | Fire rating of construction above ground. | Time, Cost | Linacc | 1 | 1 | 1 | | Strategic | Unquantified | 5,000 | To review cable routes through fire zone barriers; additional fire protection to zone penetrations | Client | | | 5,000 | 0.50 | 2,500 |
| 3.3 | Maintenance legacy items | Time, Cost, Quality, Operational | Linacc | 2 | 3 | 6 | | Strategic | Unquantified | 10,000 | | Client | | Within Tender | 10,000 | 0.25 | |
| **4.00** | **PRE-CONSTRUCTION PHASE** | | | | | | | | | | | | | | | | |
| 4.1 | Inflation/Market Price Increases | Time, Cost, Quality, Operational | Linacc | 2 | 3 | 6 | | Financial | Unquantified | | Potential tender price increases due to time period from tender to start on site 6+ months | Client | | | | | |
| 4.2 | Isolations by maintenance not being able to be carried out | Time, Cost, Quality, Operational | Linacc | 2 | 3 | 6 | | Strategic | Unquantified | 15,000 | Maintenance to be informed of works in progress/Potential trial shutdowns with Estates and subcontractor prior to contract works commencing | Client | | Health Board risk | 15,000 | 0.25 | |

| Nr | Risk Description | Risk Consequence:<br>1. Time<br>2. Cost<br>3. Quality<br>4. Operational | Scheme | Probability | Impact | Score | Risk Allocation | Category | Quantified Unquantified | Estimated cost impact £ | Management Actions | Action Owner | Review Date | Comments | Cost if it happens £ | Likelihood Factor | Expected Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.3 | Critical services being affected by the works, isolation and diversion time scales affecting the programme of works; complex critical path | Time, Cost, Quality, Operational | Linacc | 3 | 3 | 9 | | Operational | Unquantified | 50,000 | Maintenance to be informed of works in progress/Potential trial shutdowns with Estates and subcontractor prior to contract works commencing | Client | | Health Board risk | 50,000 | 0.75 | |
| 4.4 | Working within live hospital environment | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | Clear segregation/Project managed user group meetings | Client | | Health Board risk | 5,000 | 0.50 | |
| 4.5 | Maintaining existing fire escape routes | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | Agreed fire management plan to be discussed in line with hospital fire escape procedure | Client | | Health Board risk | 5,000 | 0.50 | |
| 4.6 | Working within existing department | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | Strategy to be discussed with project team & stakeholders | Client | | Health Board risk | 5,000 | 0.50 | |
| 4.7 | Logistics Construction work | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | | Client | | Health Board risk | 5,000 | 0.50 | |
| 4.80 | Logistics Daily operation of hospital inc deliveries | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | | Client | | Health Board risk | 5,000 | 0.50 | |
| 4.9 | Shut downs | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Shutdown strategy to be reviewed and agreed, potential cost/programme impact for delays | Client | | Health Board risk | 20,000 | 0.50 | |
| 4.10 | Operational continuity during works | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 10,000 | Design and construction programme and methodology to be issued to stakeholders for agreement. | Client | | | 10,000 | 0.50 | 5,000 |
| 4.11 | Approval timings | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Health board to review internal sign off procedures to ensure instructions are issued within a timely manner | Client | | Health Board risk | 20,000 | 0.50 | |
| 4.12 | General disruption due to construction activity | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 10,000 | Stakeholder engagement with users | Client | | Health Board risk | 10,000 | 0.50 | |
| 4.13 | Vacant possession/ Machine removal on time | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Health board to manage and relocation users to suit works | Client | | Health Board risk | 20,000 | 0.50 | |
| **5.00** | **CONSTRUCTION PHASE** | | | | | | | | | | | | | | | | |
| 5.1 | Noise/Dust/Vibration Risk | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 7,000 | Monitoring during construction works | Hurleys | | | 7,000 | 0.50 | 3,500 |
| 5.2 | Access/Egress | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 7,500 | Logistics plans to be reviewed and agreed | Hurleys/Client | | | 7,500 | 0.50 | 3,750 |
| 5.3 | Security of site compound and unfixed materials | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 5,000 | | Hurleys | | Manage out | 5,000 | 0.50 | |
| 5.4 | Unchartered services | Time, Cost, Quality, Operational | Linacc | 2 | 2 | 4 | | Strategic | Unquantified | 20,000 | services running in current ducts need surveying | Client | | | 20,000 | 0.50 | 10,000 |
| 5.5 | Operational policy changes | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Continuous dialogue with contractor and health board to mitigate impact. | Client | | | 20,000 | 0.50 | 10,000 |
| 5.6 | Decommisioning and recommisioning of existing plant | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 25,000 | Possible condition surveys of existing plant | Client | | | 25,000 | 0.50 | 12,500 |
| 5.7 | Protection of existing permanent works/making good | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 3,808 | Site access route to be protected | Client | | | 3,808 | 0.50 | 1,904 |
| 5.8 | Site working hours | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 20,000 | Normal working hours assummed, client to advise extent of any OOH working required. | Client | | | 20,000 | 0.50 | 10,000 |
| 5.9 | Working within live hospital corridors | Time, Cost, Quality, Operational | Linacc | 3 | 4 | 12 | | Strategic | Unquantified | 10,000 | Infection control policy to be followed | Client | | | 10,000 | 0.50 | 5,000 |
| 5.10 | Risk of accidental removal/Isolation of current systems; Hospital service interuption | Time, Cost, Quality, Operational | Linacc | 3 | 5 | 15 | | Strategic | Quantified | 50,000 | Maintenance team/estates to be consulted priort to removals and isolations; specific attention to IT installations and their routes | Client | | Delt with direct by Health Board | 50,000 | 0.50 | |
| 5.11 | Construction noise, adjacent buildings: general accoustics | Time, Cost, Operational | Linacc | 3 | 4 | 12 | | Operational | Quantified | 30,000 | | Client | | Health Board risk | 30,000 | 0.50 | |
| 5.12 | Non availability of specialist Linacc removal company and staff at required time | Time, Cost | Linacc | 2 | 3 | 6 | | Financial | Quantified | 6,000 | Pre book as far as possible in the future. | Client | | | 6,000 | 0.25 | 1,500 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | 27 | | | **Total £:** | **659,308** | | | | | | **Contingency Total £:** | **159,904** |
| | | | | | | | | | | | | | | | | **QRA Results:** | **159,904** |
| | | | | | | | | | | 38,899 | | | | | | **% of contingency** | **100.00%** |

# Business Justification Case

| | |
|---|---|
| Trust/Health Board: | Swansea Bay University LHB |
| Hospital/Site: | Singleton Hospital, Swansea |
| Project Title: | Replacement Linacc C, Singleton Hospital |
| Option | Preferred Option |
| Prepared by: | AECOM |
| Date: | November 2020 |
| Revision: | v2 |

| | |
|---|---|
| Project Title: | Replacement Linacc C, Singleton Hospital |
| Option: | Preferred Option |
| Revision: | |

BASIS OF ESTIMATING

Healthcare Capital Investment document

Main Contract Procurement Method : Single Stage Selective Tenders

Main Contract Standard Form and Option : NEC3 ECC Option A

Proposed start on site : 01/04/2021

Proposed completion date : 31/03/2022

Date budget discussed with Estates Development*(ED) :

(**Note** - as soon as it is agreed with the WG that the project will be processed via a BJC, Estates Development must be contacted to discuss the intended content of the BJC and where appropriate a meeting is then to be arranged with ED to agree a draft budget based upon functional content. A separate reconciliation document linking the draft budget with BJC costs is to be issued separately directly to ED at the time of the BJC submission to the WG. )

**Estates Development is a part of Facilities Services (previously Welsh Health Estates), tel (029) 20315500*

## Capital Cost Summary

| Ref | Cost Centre | | Net £ | VAT @ 20% £ | Gross £ |
|---|---|---|---|---|---|
| 5 | Works Cost (BJC2) | | £ 363,690 | £ 72,738 | £ 436,429 |
| 6 | Fees (BJC3) | | £ 107,252 | £ 21,450 | £ 128,703 |
| 7 | Non-works Costs (BJC3) | | £ 40,910 | £ 8,182 | £ 49,092 |
| 8 | Equipment Costs (BJC2) | | £ 2,692,632 | £ 538,526 | £ 3,231,158 |
| 9 | Contingency | (4.99% of (5+6+7+8)) | £ 159,904 | £ 31,981 | £ 191,885 |
| 10 | ***Forecast Project Out-turn Cost (Pre VAT Recovery)*** | | **£ 3,364,388** | **£ 672,878** | **£ 4,037,266** |
| 11 | LESS RECOVERABLE VAT (BJC5) | | £ - | £ 21,450 | -£ 21,450 |
| 12 | **FORECAST PROJECT OUT-TURN COST** | | **£ 3,364,388** | **£ 651,427** | **£ 4,015,816** |

Project Title: Replacement Linacc C, Singleton Hospital ☐
Option: Preferred Option

CAPITAL COSTS: WORKS AND EQUIPMENT COSTS

| Accommodation | Cost/m2 GFA £/m2 | N/A/C | Works Cost £ | Equipment Cost £ |
|---|---|---|---|---|
| **Works Costs** | | | | |
| Preliminaries; includes OH&P | | C | £ 41,473 | |
| Dems/Alts | | C | £ 6,844 | |
| Internal Walls | | C | £ 2,333 | |
| Door/Ironmongery | | C | £ 4,658 | |
| Wall Finishes | | C | £ 2,363 | |
| Floor Finishes | | C | £ 6,066 | |
| Ceiling Finishes | | C | £ 3,678 | |
| Fixtures and fittings | | C | £ 28,152 | |
| BWIC with Services | | C | £ 1,500 | |
| COVID 19 regulation working | | C | £ 2,000 | |
| uplift for 6xweeks additional prelims | | C | £ 13,362 | |
| BLDG uplift for Jan 21 start | | C | £ 3,249 | |
| Craneage/Coordination/Principal Contractor; includes £1500 COVID working | | C | £ 15,950 | |
| Pre Works Validation | | C | £ 350 | |
| Removals/Strip out | | C | £ 1,637 | |
| FCU Works | | C | £ 5,150 | |
| Ductwork Installation | | C | £ 7,468 | |
| H&C Services | | C | £ 504 | |
| Thermal Insulation | | C | £ 2,742 | |
| Drainage | | C | £ 239 | |
| BMS | | C | £ 650 | |
| Sanitaryware | | C | £ 824 | |
| Testing/Commissioning/Water Treatment | | C | £ 2,739 | |
| Record Drawings O&Ms | | C | £ 450 | |
| MECH uplift for Jan 21 start | | C | £ 1,742 | |
| Electrical Preliminaries | | C | £ 10,205 | |
| Removals/Strip out | | C | £ 2,403 | |
| Sub Mains | | C | £ 21,500 | |
| Containment | | C | £ 18,688 | |
| ETB/Earthing and Bonding | | C | £ 3,596 | |
| Lighting/Emergency Lighting | | C | £ 18,328 | |
| Power | | C | £ 8,868 | |
| Light Curtain | | C | £ 2,548 | |
| Sky Ceiling | | C | £ 1,782 | |
| IT/Data | | C | £ 7,739 | |
| Fire Alarms | | C | £ 6,943 | |
| Nurse Call/PA/Intercom | | C | £ 7,015 | |
| TV/FM | | C | £ 490 | |
| CCTV | | C | £ 8,618 | |
| Hearing induction loop; Portable | | C | £ 257 | |
| Door access interlock | | C | £ 835 | |
| Mechanical wiring | | C | £ 2,089 | |
| Linac Post completion works | | C | £ 1,485 | |
| Testing and Commissioning | | C | £ 1,252 | |
| Record Drawings O&Ms | | C | £ 869 | |
| Working Drawings | | C | £ 903 | |
| Witness Testing | | C | £ 891 | |
| Out of Hours Working | | C | £ 4,304 | |
| ELEC uplift for Jan 21 start | | C | £ 4,606 | |
| Provisional Sums: | | | | |
| Client suggestion for Structural Steel | | C | £ 2,000 | |
| Torgue Testing, Making good, core drilling | | C | £ 1,000 | |
| COVID 19 PS | | C | £ 15,000 | |
| Framework Prelims | | C | £ 15,113 | |
| Framework OH&P | | C | £ 38,240 | |
| **Equipment Costs** | | | | |
| Linac | | | | £ 2,400,000 |
| IT Infrastructure | | | | £ 129,080 |
| IT Peripherals | | | | £ 24,000 |
| QA | | | | £ 77,070 |
| Dosimetry | | | | £ 30,623 |
| Maintenance | | | | £ 21,859 |
| Training | | | | £ 10,000 |
| | | | | £ 2,692,632 |
| Less: Abatement for transferred equipment 0 % | | | | £ - |
| | | | | £ 2,692,632 |
| Works Cost - to BJC1 Summary | | | £ 363,690 | |
| | | | | £ 2,692,632 |

Tender Work Packages from Hurley's Market Testing

Taken from Hurley's returned tender submission

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | **Hurley's Initial Submission** | | | |
| | | Market Tested | Non Market Tested | Total | Total Including Hurley's Risk |
| BLDG 1 | Preliminaries; includes OH&P | £ 41,473 | £ - | £ 41,473 | £ 41,473 |
| BLDG 2 | Dems/Alts | £ 6,844 | £ - | £ 6,844 | £ 6,844 |
| BLDG 3 | Internal Walls | £ 2,333 | £ - | £ 2,333 | £ 2,333 |
| BLDG 4 | Door/Ironmongery | £ 4,658 | £ - | £ 4,658 | £ 4,658 |
| BLDG 5 | Wall Finishes | £ 2,363 | £ - | £ 2,363 | £ 2,363 |
| BLDG 6 | Floor Finishes | £ 6,066 | £ - | £ 6,066 | £ 6,066 |
| BLDG 7 | Ceiling Finishes | £ 3,678 | £ - | £ 3,678 | £ 3,678 |
| BLDG 8 | Fixtures and fittings | £ 28,152 | £ - | £ 28,152 | £ 28,152 |
| BLDG 9 | BWIC with Services | £ 1,500 | £ - | £ 1,500 | £ 1,500 |
| BLDG 10 | COVID 19 regulation working | £ 2,000 | £ - | £ 2,000 | £ 2,000 |
| BLDG 11 | Uplift for 6xweeks aditional prelims for contractor | £ 13,362 | £ - | £ 13,362 | £ 13,362 |
| BLDG 12 | Uplift for Jan 21 start | £ 3,249 | £ - | £ 3,249 | £ 3,249 |
| | Craneage/Coordination/Principal Contractor; includes | | | | |
| MECH 1 | £1500 COVID working | £ 15,950 | £ - | £ 15,950 | £ 15,950 |
| MECH 2 | Pre Works Validation | £ 350 | £ - | £ 350 | £ 350 |
| MECH 3 | Removals/Strip out | £ 1,637 | £ - | £ 1,637 | £ 1,637 |
| MECH 4 | FCU Works | £ 5,150 | £ - | £ 5,150 | £ 5,150 |
| MECH 5 | Ductwork Installation | £ 7,468 | £ - | £ 7,468 | £ 7,468 |
| MECH 6 | H&C Services | £ 504 | £ - | £ 504 | £ 504 |
| MECH 7 | Thermal Insulation | £ 2,742 | £ - | £ 2,742 | £ 2,742 |
| MECH 8 | Drainage | £ 239 | £ - | £ 239 | £ 239 |
| MECH 9 | BMS | £ 650 | £ - | £ 650 | £ 650 |
| MECH 10 | Sanitaryware | £ 824 | £ - | £ 824 | £ 824 |
| MECH 11 | Testing/Commissioning/Water Treatment | £ 2,739 | £ - | £ 2,739 | £ 2,739 |
| MECH 12 | Record Drawings O&Ms | £ 450 | £ - | £ 450 | £ 450 |
| MECH 13 | Uplift for Jan 21 start | £ 1,742 | £ - | £ 1,742 | £ 1,742 |
| ELEC 1 | Electrical Preliminaries | £ 10,205 | £ - | £ 10,205 | £ 10,205 |
| ELEC 2 | Removals/Strip out | £ 2,403 | £ - | £ 2,403 | £ 2,403 |
| ELEC 3 | Sub Mains | £ 21,500 | £ - | £ 21,500 | £ 21,500 |
| ELEC 4 | Containment | £ 18,688 | £ - | £ 18,688 | £ 18,688 |
| ELEC 5 | ETB/Earthing and Bonding | £ 3,596 | £ - | £ 3,596 | £ 3,596 |
| ELEC 6 | Lighting/Emergency Lighting | £ 18,328 | £ - | £ 18,328 | £ 18,328 |
| ELEC 7 | Power | £ 8,868 | £ - | £ 8,868 | £ 8,868 |
| ELEC 8 | Light Curtain | £ 2,548 | £ - | £ 2,548 | £ 2,548 |
| ELEC 9 | Sky Ceiling | £ 1,782 | £ - | £ 1,782 | £ 1,782 |
| ELEC 10 | IT/Data | £ 7,739 | £ - | £ 7,739 | £ 7,739 |
| ELEC 11 | Fire Alarms | £ 6,943 | £ - | £ 6,943 | £ 6,943 |
| ELEC 12 | Nurse Call/PA/Intercom | £ 7,015 | £ - | £ 7,015 | £ 7,015 |
| ELEC 13 | TV/FM | £ 490 | £ - | £ 490 | £ 490 |
| ELEC 14 | CCTV | £ 8,618 | £ - | £ 8,618 | £ 8,618 |
| ELEC 15 | Hearing induction loop; Portable | £ 257 | £ - | £ 257 | £ 257 |
| ELEC 16 | Door access interlock | £ 835 | £ - | £ 835 | £ 835 |
| ELEC 17 | Mechanical wiring | £ 2,089 | £ - | £ 2,089 | £ 2,089 |
| ELEC 18 | Linac Post completion works | £ 1,485 | £ - | £ 1,485 | £ 1,485 |
| ELEC 19 | Testing and Commissioning | £ 1,252 | £ - | £ 1,252 | £ 1,252 |
| ELEC 20 | Record Drawings O&Ms | £ 869 | £ - | £ 869 | £ 869 |
| ELEC 21 | Working Drawings | £ 902 | £ - | £ 902 | £ 902 |
| ELEC 22 | Witness Testing | £ 891 | £ - | £ 891 | £ 891 |
| ELEC 23 | Out of Hours Working | £ 4,304 | £ - | £ 4,304 | £ 4,304 |
| ELEC 24 | Uplift for Jan 21 start | £ 4,606 | £ - | £ 4,606 | £ 4,606 |
| | Sub Total | | | £ 292,336 | £ 292,336 |
| | **Provisional Sums:** | | | | |
| BLDG 1 | Client suggestion for Structural Steel | | | £ 2,000 | £ 2,000 |
| BLDG 2 | Torgue Testing, Making good, core drilling | | | £ 1,000 | £ 1,000 |
| MECH 1 | COVID 19 PS | | | £ 15,000 | £ 15,000 |
| | Total excluding Framework uplifts | | | **£ 310,336** | **£ 310,336** |
| | 4.87% Framework Prelims | | | £ 15,113 | £ 15,113 |
| | Sub Total | | | **£ 325,450** | **£ 325,450** |
| | 11.75% Framework OH&P | | | £ 38,240 | £ 38,240 |
| | **Total** | | | **£ 363,690** | **£ 363,690** |
| | **Tender Scheme Budget Cost** | | | **£ 363,690** | **£ 363,690** |

Project Title: Replacement Linacc C, Singleton Hospital ☐
Option: Preferred Option

CAPITAL COSTS: FEES AND NON-WORKS COSTS

| | | | £ | % of Works Cost |
|---|---|---|---|---|
| 1 | Fees | | | |
| | a. Project Manager | | £ 8,001 | 2.20% |
| | b. Cost Advisor | | £ 7,747 | 2.13% |
| | c. Health Planner | | £ - | 0.00% |
| | d. Architect | | £ 18,912 | 5.20% |
| | e. Civil and Structural Engineer | | £ 8,001 | 2.20% |
| | f. Building Services Engineer | | £ 20,367 | 5.60% |
| | g. Principal Designer | | £ 2,364 | 0.65% |
| | h. Supervisor | | £ 5,455 | 1.50% |
| | i. FM Advisor | | £ - | 0.00% |
| | j. Other | (list and describe) | | |
| | j.1 | Health Board - Internal Costs | £ 7,274 | 2.00% |
| | j.2 | Audit Fees | £ 3,091 | 0.85% |
| | j.3 | Pre-Construction Fee - Contractor | £ - | 0.00% |
| | j.4 | Feasibility - Consultants (Pre Framework ) | £ 7,274 | 2.00% |
| | j.5 | Commissioning | £ 1,818 | 0.50% |
| | j.6 | Ops Recharge | £ 1,455 | 0.40% |
| | j.7 | VAT Advisor | £ 1,818 | 0.50% |
| | j.8 | Business Case Support (QS) | £ 5,019 | 1.38% |
| | j.9 | General Business Case Support | £ 5,019 | 1.38% |
| | j10 | Technical Advisors; Accoustics, Fire etc | £ 3,637 | 1.00% |
| | | Total Fees to BJC1 Summary | £ 107,252 | 29.49% |

| | | £ | % of Works Cost |
|---|---|---|---|
| 2 | Non-Works Costs | | |
| | a. Land purchase costs and associated legal fees | £ - | 0.00% |
| | b. Statutory and Local Authority charges | £ - | 0.00% |
| | c. Planning and Building Control fees | £ 2,000 | 0.55% |
| | d. Other (list and describe) | | |
| | d.1 Health Board Other Costs - See list | £ 33,000 | 9.07% |
| | d.2 Survey Cost & the like | £ 5,910 | 1.63% |
| | Total Non-Works Costs to BJC1 Summary | £ 40,910 | 11.25% |

Project Title: Replacement Linacc C, Singleton Hospital ☐
Option: Preferred Option

## PROJECT CASHFLOW FORECAST

*Proposed start on site (Mobilisation):* 01/04/2021
*Proposed completion date:* 31/03/2022

| | *Year* | 0 | 1 | 2 | 3 | Total |
|---|---|---|---|---|---|---|
| | *Financial year* | Prior Years | 2020/21 | 2021/22 | 2022/23 | |
| Works Cost | | £ - | £ - | £ 363,690 | | £ 363,690 |
| Fees | | £ 46,340 | £ 9,773 | £ 51,139 | | £ 107,252 |
| Non-works Costs | | £ - | £ - | £ 40,910 | | £ 40,910 |
| Equipment Costs | | £ - | £ - | £ 2,692,632 | | £ 2,692,632 |
| Contingencies | | £ - | £ - | £ 159,904 | | £ 159,904 |
| VAT | | £9,268 | £ 1,955 | £ 661,655 | | £ 672,878 |
| | ***Sub-total*** | £ 55,608 | £ 11,728 | £ 3,969,930 | | £ 4,037,266 |
| Recoverable VAT | | -£ 9,268 | -£ 1,955 | -£ 10,227 | | -£ 21,450 |
| | ***Total*** | £ 46,340 | £ 9,773 | £ 3,959,703 | | £ 4,015,816 |

Project Title: Replacement Linacc C, Singleton Hospital
Option: Preferred Option

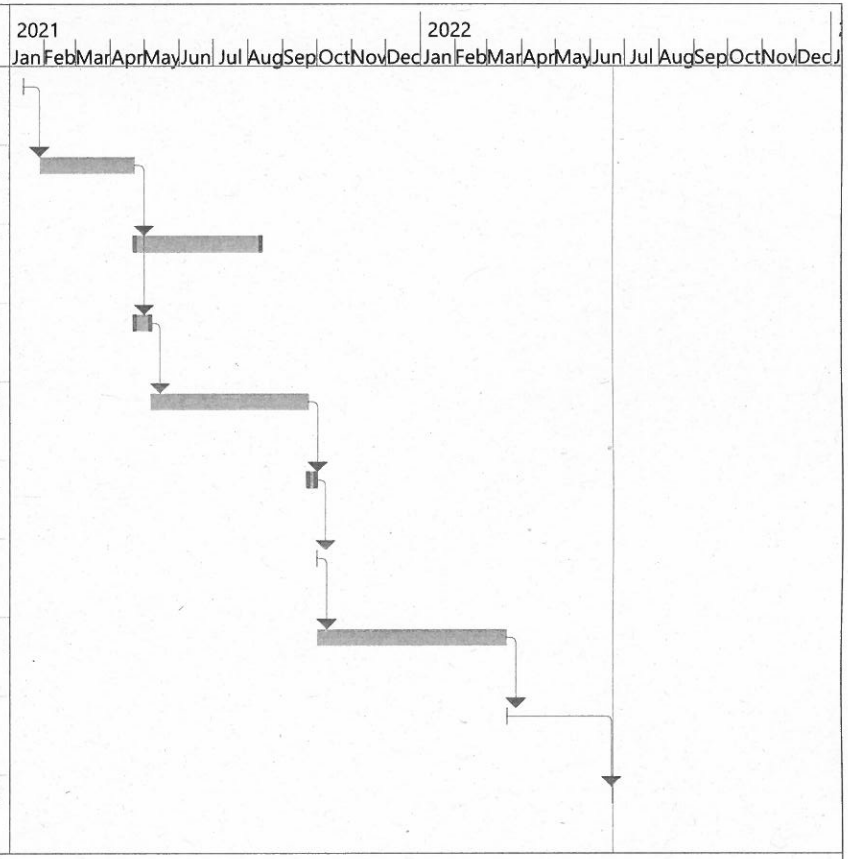
## RECOVERABLE VAT CALCULATION

| | a | b | c | d |
|---|---|---|---|---|
| | Cost Net of VAT | VAT at 20% (ie prior to recovery) | Percentage recoverable (% of col b) | Recoverable VAT (col b x col c) |
| | £ | £ | % | £ |
| Works Cost | £ 363,690 | £72,738 | 0.00% | £ - |
| Fees | £ 107,252 | £21,450 | 100.00% | £ 21,450 |
| Non-works Costs | £ 40,910 | £8,182 | 0.00% | £ - |
| Equipment Costs | £ 2,692,632 | £538,526 | 0.00% | £ - |
| Contingencies | £ 159,904 | £31,981 | 0.00% | £ - |
| ***Total*** | | | | £ 21,450 |

Replacement Linacc C, Singleton Hospital
Preferred Option

| Cost Head | Comments | Quantity | Unit | Rate | Total | Total to Business Case |
|---|---|---|---|---|---|---|
| **Non-Works Costs:** | | | | | | |
| Land Purchase costs | Not applicable | 0 | lt | £0.00 | £0 | |
| Legal Fees - Associated with Land | Not applicable | 0 | lt | £0.00 | £0 | |
| | | | | | | £0.00 |
| **Statutory and Local Authority charges:** | | | | | | |
| Gas Mains | Not applicable | 0 | lt | £0.00 | £0 | |
| Diversion of Water Main | Not applicable | 0 | lt | £0.00 | £0 | |
| Electrical Mains | Not applicable | 0 | lt | £0.00 | £0 | |
| Drainage | Not applicable | 0 | lt | £0.00 | £0 | |
| | | | | | | £0.00 |
| **Planning and Building Control fees:** | | | | | | |
| Planning Approval | Provisional allowance | 0 | lt | £2,000.00 | £0 | |
| Building Control | Provisional Allowance - £2000 | 1 | lt | £2,000.00 | £2,000 | |
| | | | | | | £2,000.00 |
| **Health Board Other Costs:** | | | | | | |
| Arts | Provisional Allowance | 1 | lt | £5,000.00 | £5,000 | |
| IT wiring, telephony & IT Support | | 1 | lt | £6,000.00 | £6,000 | |
| Decant Accommodation / Costs | None | 0 | lt | £0.00 | £0 | |
| Removal of Existing Lin Acc | Budget allowance | 1 | lt | £15,000.00 | £15,000 | |
| Portering Cost during decant of existing accommodation | | 1 | lt | £1,500.00 | £1,500 | |
| Portering Cost associated with bringing the New Facility into Use | | 1 | lt | £1,500.00 | £1,500 | |
| Deep clean on completion of the works - Clinical Clean | | 1 | lt | £1,500.00 | £1,500 | |
| Non Statutory Signage | | 1 | lt | £1,500.00 | £1,500 | |
| Site Security & Temporary Secure Storage | Not Required | 0 | lt | £0.00 | £0 | |
| Legal Fees - Non Land Associated | Not Required | 0 | lt | £0.00 | £0 | |
| Waste Removal Costs to ISO14001 | As advised by HE under email 15/02/18 | 1 | lt | £1,000.00 | £1,000 | |
| Additional works and controls for COVID regulations | | 1 | it | £0.00 | £0 | |
| | | | | | | £33,000.00 |
| **Other Costs:** | | | | | | |
| Acoustic Consultants Fee | Not required | 0 | lt | £0.00 | £0 | |
| Air Leakage Testing | Not required | 0 | lt | £0.00 | £0 | |
| Archaeological Watching Brief | Not required | 0 | lt | £0.00 | £0 | |
| Asbestos survey & Removal | Type 3 Refurbishment & Demolition survey | 1 | lt | £3,000.00 | £3,000 | |
| BREEAM assessor | Not required | 0 | lt | £0.00 | £0 | |
| CCTV Drainage Survey | Provisional allowance | 1 | lt | £0.00 | £0 | |
| Climate Based Day Time Modelling | Not required | 0 | lt | £0.00 | £0 | |
| Condition Surveys Including Dimensional Survey | Included in Prof Fees | 0 | lt | £0.00 | £0 | |
| Contamination Soils Assessment | Not required | 0 | lt | £0.00 | £0 | |
| DDA consultant | Not required - Included in Architect Fee | 0 | lt | £0.00 | £0 | |
| Environmental Consultant / Ecologist Report / Tree Survey etc. | Not required | 0 | lt | £0.00 | £0 | |
| Fire Engineering | Included in Prof Fees | 0 | lt | £0.00 | £0 | |
| Flood risk assessment | Not required | 0 | lt | £0.00 | £0 | |
| Ground Investigation | Not required | 0 | lt | £0.00 | £0 | |
| Historical records | Included in Prof Fees | 0 | lt | £0.00 | £0 | |
| Interior Design / Landscaping / Sundry Design | Not required | 0 | lt | £0.00 | £0 | |
| Section 278 Design | Not required | 0 | lt | £0.00 | £0 | |
| Site Investigation/Testing | Provisional allowance | 1 | lt | £2,000.00 | £2,000 | |
| Topographical Surveys | Not required | 1 | lt | £910.00 | £910 | |
| Traffic Survey - Highways | Not required | 0 | lt | £0.00 | £0 | |
| Utilities Survey | Not required | 0 | lt | £0.00 | £0 | |
| Virtual Model | Not required | 0 | lt | £0.00 | £0 | |
| | | | | | | £5,910.00 |
| | | | | | | £40,910 |

| ID | Task Mode | Task Name | Duration | Start | Finish |
|---|---|---|---|---|---|
| 1 | | Health Board endorsement | 1 day | Wed 13/01/21 | Wed 13/01/21 |
| 2 | | WGov approval | 3 mons | Thu 28/01/21 | Wed 21/04/21 |
| 3 | | Place equipment order | 4 mons | Thu 22/04/21 | Wed 11/08/21 |
| 4 | | Mobilisation on site and removal of equipme | 2 wks | Thu 22/04/21 | Wed 05/05/21 |
| 5 | | Enabling Works and Main Works | 5 mons | Thu 06/05/21 | Wed 22/09/21 |
| 6 | | Technical Commissioning | 1 wk | Thu 23/09/21 | Wed 29/09/21 |
| 7 | | Handover | 1 day | Thu 30/09/21 | Thu 30/09/21 |
| 8 | | Operational Commissioning | 6 mons | Fri 01/10/21 | Thu 17/03/22 |
| 9 | | Operational | 1 day | Fri 18/03/22 | Fri 18/03/22 |
| 10 | | Post Project Evalution | 1 day | Mon 20/06/22 | Mon 20/06/22 |




Project: Appendix E - Indicative
Date: Thu 17/12/20

| | | |
|---|---|---|
| Task | Inactive Summary | External Tasks |
| Split | Manual Task | External Milestone |
| Milestone | Duration-only | Deadline |
| Summary | Manual Summary Rollup | Progress |
| Project Summary | Manual Summary | Manual Progress |
| Inactive Task | Start-only | |
| Inactive Milestone | Finish-only | |

| **1: To improve Quality of service and Patient Safety** | | | |
|---|---|---|---|
| Full description of benefit | Replace current Elekta Precise Linear Accelerator with an up-to-date Elekta Versa HD Linear Accelerator. Improvements in quality of service and patient safety. | | |
| Type of Benefits | **NON-CRB & QB & NON-QB** | | |
| Potential disbenefits | None | | |
| Actions necessary to realise benefits | - Change in service model/scope (SBRT, increased use of SGRT and IGRT)<br>- Identify acceptable/affordable decant solutions.<br>- Confirm availability of capital funding.<br>- Appoint suitably qualified/experienced/resourced specialist supplier.<br>- Minimise disruption to clinical services during works stage.<br>- Commission and test new equipment. | | |
| Timescale | 12 months | | |
| How the benefits will be measured and monitored | **Baseline (Autumn 2020), if applicable** | **Target Improvement (Outcome)** | **Performance Tool/Measure** |
| | 1. Existing Fleet of Precise Linacs are outmoded and do not offer latest standards of care | Increased 3D imaging (IGRT) and micro MLC (Agility) for improved target conformity, whilst lowering Organ at risk doses | **NON-CRB** Increased use of IMRT/ VMAT advanced dose delivery techniques for SWWCC patients undergoing Radiotherapy |
| | 2. Introduction of Surface Guided Radiotherapy | Improved patient positioning and automated gating of radiation beam | **QB** Achieve at least 80% of Deep Inspiration Breath-Hold (DIBH) Patients receiving SGRT |
| | 3. No 3D Image Guided Radiotherapy | Move from 2D imaging to 3D imaging (IGRT) for those patients where there will be a clinical benefit | **NON-CRB** Quantitative assessment of patients receiving image guided radiotherapy / adaptive radiotherapy via the NHSE Radiotherapy Dataset |
| | 4. No Stereotactic Body Radiotherapy (SBRT) | Clinically Introduce SBRT for Lung patients | **NON-QB** Reduced fractionation schemes for SBRT patients potentially increasing capacity |
| Lead director responsible for delivering benefits | Mrs Jan Worthing, Service Director, Singleton Delivery Unit, SBUHB | | |
| Lead managers responsible for monitoring benefits | Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB | | |
| **2: To achieve Compliance with industry standards** | | | |
| Full description of benefit | Compliance with national standards and support of national procurement strategies | | |
| Type of Benefits | **QB & CRB & NON-CRB** | | |
| Potential disbenefits | None | | |
| Actions necessary to realise benefits | - Confirm availability of capital funding.<br>- Appoint suitably qualified/experienced/resourced specialist supplier. | | |

| | | | |
|---|---|---|---|
| | - Minimise disruption to clinical services during works stage.<br>- Commission and test new equipment. | | |
| Timescale | 12 months | | |
| How the benefits will be measured and monitored | **Baseline (end June 2020), if applicable** | **Target Improvement (Outcome)** | **Performance Tool/Measure** |
| | 1. Not IRMER (2017) compliant, around imaging dose optimisation as currently using 2D imaging | Move to 3D imaging, optimizing imaging dose delivered and improving targeted radiotherapy to tumour | Quantitative assessment of patients receiving image guided radiotherapy / adaptive radiotherapy via the NHSE Radiotherapy Dataset |
| | 2. No currently using SGRT | Introduce SGRT for all suitable patients | Number of Breast / Lung / thorax patients receiving Radiotherapy, IGRT and SGRT |
| | 3. Not all Breast patients can have DIBH | Increased proportion of patients eligible for DIBH, by utilising SGRT and FFF treatment modalities, to reduce breath-hold time | As above |
| Lead director responsible for delivering benefits | Mrs Jan Worthing, Service Director, Singleton Delivery Unit, SBUHB | | |
| Lead managers responsible for monitoring benefits | Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB | | |
| **3: To improve Economy** | | | |
| Full description of benefit | Improvements in economy | | |
| Type of Benefits | **NON-CRB & QB & CRB** | | |
| Potential disbenefits | None | | |
| Actions necessary to realise benefits | - Confirm availability of capital funding.<br>- Appoint suitably qualified/experienced/resourced specialist supplier.<br>- Minimise disruption to clinical services during works stage.<br>- Commission and test new equipment. | | |
| Timescale | 12 months | | |
| How the benefits will be measured and monitored | **Baseline (end June 2020), if applicable** | **Target Improvement (Outcome)** | **Performance Tool/Measure** |
| | 1. All breasts not IMRT/VMAT. | Clinically introduce IMRT / VMAT for all breast treatments thereby lowering organ at risk doses and reducing side effects | **NON-CRB** Number of breast patients receiving IMRT/VMAT obtained from RTDS |
| | 2. Currently sequential Breast Boosts take extra 5 fractions | Move to a Simultaneous integrated boost (SIB) for breast patients, this will increase capacity (60-70 patients per year) | QB & CRB Number of patients receiving an SIB, and the capacity released for additional patients |

| | | | |
|---|---|---|---|
| Lead director responsible for delivering benefits | Mrs Jan Worthing, Service Director, Singleton Delivery Unit, SBUHB | | |
| Lead managers responsible for monitoring benefits | Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB | | |
| **4: To improve Efficiency** | | | |
| Full description of benefit | Improvements in efficiency | | |
| Type of Benefits | **NON-CRB & CRB** | | |
| Potential disbenefits | None | | |
| Actions necessary to realise benefits | - Confirm availability of capital funding.<br>- Appoint suitably qualified/experienced/resourced specialist supplier.<br>- Minimise disruption to clinical services during works stage.<br>- Commission and test new equipment. | | |
| Timescale | 12 months | | |
| How the benefits will be measured and monitored | **Baseline (June 2020), if applicable** | **Target Improvement (Outcome)** | **Performance Tool/Measure** |
| | 1. Limited IMRT / VMAT delivery on current machine | Increased IMRT and VMAT, improved treatment outcomes, faster dose delivery potentially reducing slot length | Proportion of patients receiving IMRT / VMAT. VMAT delivers improved dose distributions than current techniques in less than half the time |
| | 2. Slow treatments on current machine (dose rate ~400 MU/minute) | New linac will have Flattening Filter Free modality, which can deliver dose 4-6 times faster | Number of patients eligible for FFF treatments |
| | 3. Existing system does not support SGRT | Introduce SGRT, increasing safety as this automatically gates the treatment beam and increases efficiency | Number of Breast / Lung / thorax patients receiving Radiotherapy, IGRT and SGRT |
| | 4. SIB | Improve efficiency by integrating breast boosts saving treatment capacity | Increased capacity from clinical introduction of SIB |
| Lead director responsible for delivering benefits | Mrs Jan Worthing, Service Director, Singleton Delivery Unit, SBUHB | | |
| Lead managers responsible for monitoring benefits | Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB | | |
| **5: To improve Effectiveness** | | | |
| Full description of benefit | Improvements in effectiveness | | |
| Type of Benefits | **NON-CRB & NON-QB** | | |
| Potential disbenefits | None | | |
| Actions necessary to realise | - Confirm availability of capital funding. | | |

<table>
<tr><td>benefits</td><td colspan="3">- Appoint suitably qualified/experienced/resourced specialist supplier.<br>- Minimise disruption to clinical services during works stage.<br>- Commission and test new equipment.</td></tr>
<tr><td>Timescale</td><td colspan="3">12 months</td></tr>
<tr><td rowspan="5">How the benefits will be measured and monitored</td><td>Baseline (end June 2020), if applicable</td><td>Target Improvement (Outcome)</td><td>Performance Tool/Measure</td></tr>
<tr><td>1. No IMRT / VMAT for breast</td><td>Introduce IMRT / VMAT for breasts, this reduces doses to organs at risk, and increases the conformity of dose to the target thereby increasing survival and reducing side effects</td><td>Proportion of patients receiving IMRT/ VMAT</td></tr>
<tr><td>2. No SGRT</td><td>Introduce SGRT, improves effectiveness of treatments by only delivering dose when tumour is in the correct position due to breathing motion and automatically gating the beam if patient breathes or moves</td><td>Number of patients receiving radiotherapy and SGRT</td></tr>
<tr><td>3. Only 2D imaging on current linac</td><td>Move to 3D imaging (IGRT) for patients</td><td>Number of patients receiving radiotherapy and IGRT</td></tr>
<tr><td>4. Differing types of linacs in the department and inability to transfer patients between them</td><td>Move towards a single type of linac, enabling patients to move between all machines in case of breakdown, etc, increases effectiveness of treatments as less gaps in treatment</td><td>Reduced number of patient cancellations due to incompatibility of machines</td></tr>
<tr><td>Lead director responsible for delivering benefits</td><td colspan="3">Mrs Jan Worthing, Service Director, Singleton Delivery Unit, SBUHB</td></tr>
<tr><td>Lead managers responsible for monitoring benefits</td><td colspan="3">Mrs Ceri Gimblett, Service Group Manager, Cancer Services, SBUHB</td></tr>
</table>

**Key:**
**CRB** Cash Releasing Benefits (e.g. avoided costs);
**NON-CRB** non-Cash Releasing Benefits (e.g. staff time saved, economic benefits);
**QB** Quantifiable Benefits (e.g. achievement of targets);
**NON-QB** Non-Quantifiable or Qualitative Benefits (e.g. improved integration of services)