

Facilities Infrastructure Remediation Programme (FIRP): Tranche 3

Detailed Business Case

November 2024

Document information

Document Information

Information	
Document ID	
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Issue date	12 November 2024

Version History

Version	Issue date	Purpose
0.1		Initial draft
0.2	17 May 2024	For internal review
0.3	27 August 2024	Revised with new option
0.4	02 September 2024	Financial Case included
1.0	05 September 2024	Final with IIG assurance
2.0	10 September 2024	Final with IIG Finance assurance
2.1	25 September 2024	Ministry feedback included
2.2	15 October 2024	CAB paper updates included
2.3	12 November 2024	Commissioner's updates included

Document Sign-Off

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Investment Summary

Investment Details

Details	
Project name	Facilities Infrastructure Remediation Programme Tranche 3
Project ID	P7000
Project Director	District IIG Lead, Te Toka Tumai Auckland
SRO	Head of Infrastructure, Northern Region IIG
RPA	Medium
Investment pathway	Medium

Commissioning Checklist

Checklist	
Investment type	☒ Facility ☒ Equipment ☒ Infrastructure ☒ Data and digital ☐ Other (specify)
Location	Auckland City Hospital and Greenlane Clinical Centre
Project drivers	☒ Growth / capacity ☒ Replacement ☒ Quality of service delivery / service levels
Summary	This business case proposes to deliver Tranche 3 of the Facilities Infrastructure Remediation Programme, with future works to be undertaken in Tranche 4. The investment will continue to remediate the most critical assets at Auckland City Hospital and Greenlane Clinical Centre, provide electrical site resilience, progress alternative heating options, improve overall building safety and efficiency, and improve site safety.
Infrastructure Investment Plan	s 9(2)(b)(ii)
Whole-of-life cost (WOLC)	
Capital costs	
Operational costs (incl. depreciation)	
Proposed capital funding sources	☒ Health Capital Envelope (HCE, s 9(2)(b)(ii)) ☐ Baseline (insert amount) ☐ Other (specify source and insert amount)
Proposed operating funding sources	☒ Baseline s 9(2)(b)(ii) ☐ Other (specify source and insert amount)
Delivery timeframes	Start: April 2025 End: December 2027

Benefits	• Optimised operational and financial stability: Reduction in the Operational Risk Rating, resulting in a reduced likelihood of failure of critical assets and consequently a reduced risk of harm. Proactive maintenance will reduce unplanned outages and the negative impacts on services and patients. • A better, safer environment: Facilities infrastructure will be more in line with current standards and requirements. Safety for maintenance and facilities staff will be improved by removing steam systems from plant and tunnel areas. • More effective and efficient facilities and infrastructure: Improved site information, enhanced monitoring, and control of the site wide building services systems. Increased resilience of the high voltage and emergency generation network. Transfer from fossil fuel to electrical energy heating source.
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Contents

1.	Executive Summary	7
1.1	Investment Summary	7
1.2	Health New Zealand Priorities	8
1.3	Strategic Case	8
1.4	Economic Case	13
1.5	Financial Case	15
1.6	Commercial Case	16
1.7	Management Case	16
1.8	Confidence in Information	17
1.9	Next Steps and Investment Request	17
2.	Programme Update	19
2.1	FIRP Overall Programme and Scope	19
2.2	Tranches 1 and 2 Benefits Realisation	21
3.	Strategic Case	27
3.1	Background	27
3.2	Organisational Overview	27
3.3	Strategic Alignment	27
3.4	Te Tiriti O Waitangi and Māori Health Equity	30
3.5	Key Stakeholders	31
3.6	Problem Definition	32
3.7	Investment Objectives	33
3.8	Benefits and Disbenefits	34
3.9	Risks, Constraints, Dependencies, and Assumptions	37
4.	Economic Case	40
4.1	Introduction	40
4.2	Optioneering	40
4.3	Evaluation Approach	41
4.4	Options Evaluation	43
4.5	Recommendation	48
5.	Commercial Case	50
5.1	Required Services	50
5.2	Market Context	50

5.3	Broader Outcomes	52
5.4	Procurement Strategy	53
5.5	Commercial Arrangements	56
5.6	Infrastructure Commission Contribution	60
6.	Financial Case	61
6.1	Overall Financial Summary	61
6.2	Key Financial Changes	61
6.3	Key Assumptions.....	62
6.4	Funding Sources	65
7.	Management Case.....	66
7.1	Project Governance and Management	66
7.2	Outline Tranche 3 Timeline	71
7.3	Change Management.....	72
7.4	Dependency Management.....	72
7.5	Lessons Learnt.....	73
7.6	Benefits Realisation Management	73
7.7	Risk Management Strategy	73
7.8	Project and Business Assurance	74
7.9	Stakeholder Management.....	74
	Appendix 1: Documents available on request.....	75
	Appendix 2: Glossary	77

1. Executive Summary

1.1 Investment Summary

This business case is seeking s 9(2)(b)(ii) over three years for the delivery of the third tranche of investment in the Facilities Infrastructure Remediation Programme (FIRP). Auckland City Hospital is New Zealand's only Quaternary Hospital which provides health and disability services to more than half a million people living in central Auckland, regional services for Northland and greater the Auckland region, as well as and specialist national services for the whole of New Zealand and several Pacific countries. These services include Regional Cancer and Blood Service, Neurosurgery, Cardiology, General Surgery, Orthopaedics and Gynaecology.

FIRP was established to address risks around asset failure affecting clinical service delivery at New Zealand's largest public hospital and clinical research facility. The FIRP programme business case approved in 2017 set out a proposed five tranches of investment. Tranches 1 and 2 have been approved and are in delivery.

The proposed investment in tranche three is a continuation of and builds on the work of tranche one (\$303.791 million) and two (\$367.109 million) of the FIRP to reduce the risk of service failure of infrastructure. These facilities (buildings, fire and electrical, boilers, lifts etc.) are used by all patients and staff, and "keep the lights on 24/7" at the hospital to ensure all clinical services continue to function.

This investment will:

- Remediate priority **critical/high risk assets** nearing or at end of life, in the most critical buildings to ensure ongoing functionality of key services at Auckland City Hospital and Greenlane Clinical Centre.
- Undertake the minimum works required to complete the **electrical resilience** for high voltage supply in the current case, to ensure power security for Auckland City Hospital.
- Undertake the complete design for Auckland City Hospital to **progress alternative heating options**, while delivering quick to market opportunities. This is the minimum viable work to reduce reliance on the existing steam system to improve its operational reliability in the short term, while providing significant utility savings.
- **Address building safety and compliance** by integrating fire and electrical systems into the Building Management System while modernising the obsolete communications infrastructure.
- Undertake the minimum amount of work to implement the Reliability Centred Maintenance platform, gaining early advantage of data collection to **maximise the working life of the existing assets** once sensors have been installed.
- Undertake the clearance works required for asbestos removal in line with the **Health and Safety Work Act**.
- **Not require** any additional full time equivalent changes to staff (clinical or otherwise).

1.2 Health New Zealand Priorities

Throughout 2023 Health NZ undertook an intensive process to identify national priorities for investment in health infrastructure. This process was informed by senior clinical leadership, regional representatives and infrastructure planners, and was ultimately signed off by the Health NZ Board in December 2023.

These priorities, set over ten years, are the basis for the Infrastructure Investment Plan which is currently under consideration by Ministers. Priorities for infrastructure investment incorporated the following considerations:

- Their importance within the approved National Clinical Services and Campus Plan. The NCSCP sets Health NZ's strategic direction for changes in models of care and service delivery models required to meet Government expectations for the provision of health care.
- Delivery of benefits committed to through projects planned and approved prior to the establishment of Health NZ.
- The level of risk associated with the asset, using a risk framework applied consistently applied across all regions.
- The staging of investments to enable long term campus development (for example, investment in site infrastructure ahead of increases in capacity).
- The level of readiness for each investment, including the lead time required for clinical and infrastructure planning prior to commitments being sought.

Prioritised investments are review annually. Investments that sit within a budget year will be prioritised against one another to demonstrate absolute priorities within the budget process.

While the Investment Plan is yet to be approved by Cabinet, priorities for the Budget 2025 process identified through the development of the plan have been reaffirmed by Health NZ leadership. The business cases presented for consideration in Budget 2025 are consistent with those outlined in the draft IIP under consideration by Ministers.

1.3 Strategic Case

This business case builds on the Strategic Assessment (approved June 2017), the Programme Business Case and Tranche 1 Business Case (both approved August 2018) and the Tranche 2 Business Case (approved December 2019). As part of the Tranche 1 and 2 works, initial preparatory design work has been completed to inform the Tranche 3 business case.

The Investment Objectives and Benefits outlined in the Programme Business Case are still valid for Tranche 3.

Investment Objectives (Programme Business Case)

- To reduce risk to ongoing clinical service delivery, by ensuring facilities infrastructure is operational and at a lower risk of failure as each project is completed.
- To remediate critical facilities infrastructure, to a level which enables planned growth and changes in usage to be delivered, in line with the proposed site masterplans.
- To improve compliance with current legislation for the facilities infrastructure remediated as each project is completed.
- To achieve greater cost-effectiveness of facilities infrastructure wherever new or replacement assets are deployed as each project is completed.

Benefits (Programme Business Case)

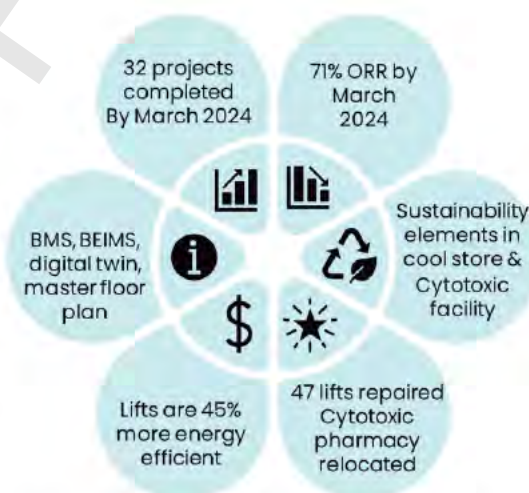
- **A better, safer environment:** The investment will bring facilities infrastructure more in line with current standards and requirements e.g. improving safety for maintenance and facilities staff as aged steam systems are removed from plant and tunnel areas.
- **Optimised operational and financial stability:** This investment will continue to reduce the Operational Risk Rating by addressing the deferred high risk and highly critical assets, with reduced likelihood of failure of critical assets and consequently a reduced risk of harm. Investment in proactive Reliability Centred Maintenance rather than reactive maintenance will reduce unplanned outages and the negative impacts on services and patients.
- **More effective and efficient facilities and infrastructure:** Improved site information, with enhanced monitoring and control of the site wide building services systems, improving building safety and reducing the risk of asset failure. Transfer from fossil fuel to electrical energy heating sources utilising heat pump technology, significantly reducing the carbon footprint and improving site resilience to align with the Government mandate to reduce carbon emissions.

Progress to Date

Tranche 1 and 2 are well advanced in delivery. On a time to completion basis, Tranche 1 is 80% completed and Tranche 2 is 78% completed. The work of these tranches is expected to be completed by December 2025.

As of March 2024, 32 projects within FIRP have been completed, significantly improving the quality of infrastructure and the experience of patients, visitors and staff.

As projects progress, benefits are continually realised. Infrastructure is more resilient, with increased generator capacity, more energy efficient assets, and reduced risk of power outages. The site information is better, with increased understanding of power quality, asset condition, and floor plans. Patients and visitors have a better onsite experience (such as fewer lift outages). Projects have started to realise environmental improvements, through the replacement of old and inefficient assets with more cost efficient and environmentally sustainable alternatives.



Benefits Realised to Date

Benefits realised to date for Tranche 1 and 2 are numerous and are both qualitative and quantitative in nature. Some highlights include:

- **Reduced risk of asset failure**
 - A marked reduction in the overall Operational Risk Rating, achieving 71% of the planned risk reduction benefits for Tranche 1 to date.
 - Reduced the risk to the integrity of the power network from an unforeseen failure event requiring extended power outages.
 - Reduced cyber/operational risk, and increased access to more accurate graphical and geospatial site information.

- Reduced risk of failure for water services pump assets, medical gas and vacuum services. Ring main systems have been extended to improve overall site resilience and future growth capability, significantly reducing risk of outages caused by accidental damage.
- Reduced likelihood of/consequences from failure of heating, ventilation and air conditioning assets and/or services.
- Fewer prolonged/unplanned outages, due to increased reliability of new emergency lighting powered by uninterruptible power supply.
- Reduced in-ground risk which enabled future programme efficiencies, by relocating utilities prior to commencement of Tranche 2 works.
- Replacement of old under-rated cabling to reduce the potential for high voltage power outages.
- **Improved environmental sustainability**
 - Cool store – improved cleaning, hygiene and efficiencies due to new floor finishes, separation from the loading dock, upgraded exhaust hood, ventilation, and purpose-built refrigeration panel construction and modern efficient cooling system.
 - Cytotoxic delivery via new purpose-built facility that includes sustainability design elements such as utilising rainwater harvesting, an electric delivery vehicle and charging facility, energy efficient light emitting diode lighting, a solar multi-panel roof system, and optimised mechanical systems.
 - Improved overall site efficiency and energy reporting through the upgraded Building Management System works done to date.
- **Improved patient and whānau safety, quality, and experience:**
 - As of March 2024, 47 of 50 lifts and an escalator have been replaced with more modern, responsive, and reliable units, resulting in less wait time for patients and staff, and a more reliable service.
 - Significant improvement of Cytotoxic delivery via the new purpose-built facility that improves the staff working environment, while allowing for safer handling and manufacturing in line with current international standards.
 - Significantly reduced risk of electrical or water supply interruption.
 - Upgraded Building Management Systems, enabling more data and analysis of the campus mechanical systems to fine tune the comfort conditions.
 - New cool store allowing improved layout and better separation from the loading dock meaning enhanced food safety and storage in purpose built cool store.
- **Improved cost effectiveness**
 - Improved energy efficiency for lifts and new assets.
 - Savings in the steam usage and overall heating generation costs with less energy used to store hot water in old, inefficient calorifiers.
 - A more balanced and efficient site high voltage network that provides more detailed data on load usage. Whilst this alone is not necessarily going to result in savings, it will provide detailed load profiling and a more balanced site load profile which will result in reduced operational intervention and cost.

- **Greater site and asset knowledge**

- Improved site load and capacity information is available, enabling more efficient site infrastructure management.
- Facilities Services Management Agreements are used to improve the knowledge of the facilities maintenance team as it relates to the new works and assets.
- Building model and master floor plans, digital surveys completed, asset systems replaced, and information updated.
- More detailed understanding of the remaining site assets and their general condition following extensive auditing and reporting. This will provide more concise and relevant data to inform the upcoming Asset Management Plan.
- Extensive in-ground services investigations during the works have resulted in a much broader knowledge of existing sites, enabling updates to the existing as-built information which enables future planning to be completed with more certainty around services. New in-ground assets have been captured by 3D survey as part of the as built process.

Works will continue on Tranche 1 and 2 through to the end of 2025 and further benefits will continue to be progressively realised.

Broader Outcomes and Organisation Benefits Realised to Date

In addition to the specific infrastructure benefits planned and realised, Tranche 1 and 2 has delivered organisational capability that will support Tranche 3's delivery and the provision of value to Health New Zealand. These include:

- **The implementation of the FIRP Programme Management Office to deliver the works:** This has resulted in a broad cross section of hospital and industry people being co-located covering the breadth of the programme. Their expertise and the lessons they have learnt delivering Tranche 1 and 2 has been shared with IIG and Regionally as.
- **The Centre for Excellence in Health Infrastructure programme:** This has been developed to enable future project managers looking for a career in the health sector to be better prepared and informed of the unique challenges of health projects.
- **The implementation of extensive site digital surveys:** These provide a "digital twin" of the hospital. The project aims to reduce costs, increase operational efficiency, and allow stakeholders to troubleshoot with ease and track assets spatially.
- **The development of a Supervisory Control And Data Acquisition Controls simulation environment hosted remotely offsite:** This results in a reduced software upgrade risk, enables operational trouble shooting outside of the "live" environment, and allows more surety of outcomes and streamlined integration of new systems and projects.
- **Data and systems maturity:** Data was standardised in line with International Organisation of Standardisation and Uniclass standards. This will enable a more streamlined migration to a national asset management system in the future.
- **Training and Upskilling:** FIRP has enabled health project delivery experts to upskill the wider market, onboarding more businesses, training consultants and contractors on how to deliver health infrastructure projects.
- **Equity outcomes:** Māori (Pacifica, etc.) have been employed to deliver projects, whilst receiving training from the wider team on how to deliver health infrastructure projects. Tikanga has been embraced and the use of Te Reo Māori is encouraged as part of the project delivery process.

- **Standardisation of several technical standards and operational processes:** These have been incorporated into Business-as-Usual operations. Gaps were identified in existing standards and process that have been addressed by FIRP.

Risks

Risks for Tranche 3 have been assessed at a programme level, noting that workstream risks are covered within the established Risk Management Framework in use on FIRP. Key risks are summarised in Table 1.

Table 1: Keys risks summarised

Risk	L	I	Potential Consequences of Failure
If funding is not approved or is delayed, this will result in a slowing down or closure of the FIRP. Assets may fail resulting in service disruption, future clinical demand will not be met, and eventual replacement costs will be higher due to inflation and escalation.	Medium	High	• Funding will be required to undertake critical design/enabling works. Assets that require imminent intervention must be addressed. • Reprioritise other capital projects.
If FIRP is disestablished, this will result in a loss of expertise, an inability to retain existing skilled resource, increased costs to onboard a new team that has no/limited knowledge of how to deliver health infrastructure projects, or of FIRP, increased programme delivery timeframes due to inefficiencies, and increased risk to services due to potential lack of experience.	Medium	High	• Maintain the key roles that relate to the scope of Tranche 3 planned works. • Enable planning/design works to be undertaken during the transition from Tranche 1 and 2 to Tranche 3, so that works can continue while funding approval is awaited.
If there is a serious harm or fatal incident on site while undertaking project works, this may result in potential criminal negligence investigations, and increased costs and programme delays (as works will be halted during a WorkSafe investigation).	Low	High	• Leverage established processes that promote proactive and collaborative practices. • Continued use of the dedicated FIRP health and safety team for random site verifications and to assist all parties to live the 'no-blame' culture. • Management attendance at health and safety meetings and walks. • Internal and independent health and safety audits of projects.
Liquidation events of contractors/subcontractors may result in cost increases, programme delays, a reduction in market capacity to deliver works, and a risk of responsibilities and liabilities being confused.	High	High	• Enhanced due diligence prior to the award of contracts and utilisation of market intelligence from Consultants, Government Agencies, etc. to make informed judgements on market risks. • Personal Securities Register to ensure ownership of goods, so that

Risk	L	I	Potential Consequences of Failure
			they are not impacted under a liquidation event. - Implement reasonable performance and retention bonds. - Consider temporary favourable payment terms (where appropriate), such as fortnightly payments, to help struggling trades.

1.4 Economic Case

Options Analysis

Originally the scope of Tranche 3 was briefed on the basis that the remaining three tranches of work planned under the Programme Business Case would be delivered as one final tranche to complete FIRP. Notification was received from Infrastructure Investment Group in August 2024 that further affordability options needed to be considered as part of this business case. Three approaches were considered as follows:

- Option 1 'Do Nothing' – the programme of work would finish at the conclusion of FIRP Tranche 1 and 2.
- Option 2 'Do Everything' – complete FIRP by undertaking a revision of the original scope briefed in the Programme Business Case. s 9(2)(b)(ii)
- Option 3 'Do Minimum' – significantly reduce the scope of Option 2, to undertake the minimum work required to manage critical risk while making meaningful progress toward realising FIRP's benefits. s 9(2)(b)(ii)

Recommended Option

It is recommended that Option 3 'Do Minimum' proceeds. This is not the preferred option. However, it is recommended to manage total capital demand at this time with other Health NZ priorities also requiring funding. Examples of assets that will be replaced and the consequences of not replacing them are summarised in Table 2.

Table 2: Examples of potential asset failures and associated consequences

Asset	Asset Status	Potential Consequences of Failure
Air Handling Units – these serve several critical departments including PICU and NICU, as well as isolation rooms (infection control).	End of life (with no back-ups)	- Loss of ventilation (heating and cooling) – room temperatures will rise to levels not suitable for patient wellbeing. - The pressurisation regime for infection control would be lost, increasing the risk of infection spread.
Emergency Chiller – provides backup cooling for critical equipment (MRI), ensuring services can be provided by the Radiology Department.	End of life	- The radiology department will not be operational, causing further delays to patient care. - Without cooling being provided to the MRI magnets, recharging the helium cooling is an expensive operation.

Asset	Asset Status	Potential Consequences of Failure
Isolation Fans – maintain negative pressure in isolation rooms for contagious patients. Some fans serve multiple rooms.	End of life	Failure of these fans will result in loss of containment, and an increase in the potential for the spread of the contagion.

Option 3 is the minimum work required to provide meaningful progress towards the full benefits realisation of FIRP, s 9(2)(f)(iv) Key risks will be managed by:

- Addressing the deferred assets nearing or, at end of life in the most critical buildings at Auckland City Hospital and Greenlane Clinical Centre.
- Completing the electrical resilience for high voltage supply in the current case to ensure power security for Auckland City Hospital.
- Undertaking the complete design for the alternative heating options of Auckland City Hospital while delivering quick to market opportunities. This is the minimum viable work to reduce reliance on the existing steam system to improve is operational reliability in the short term, while providing significant utility savings.
- Implementing the Reliability Centred Maintenance platform, gaining early advantage of data collection to maximise the working life of the existing assets where sensors have been installed.
- Undertaking the required works under the Health and Safety Work Act to support the reduced scope of the workstreams noted above.

The recommended approach does not require any additional staff.

There remains significant residual risk as this option does not achieve the full planned benefits of Option 2. s 9(2)(f)(iv)

. If this process is carefully managed, the main dis-benefit of total cost increases due to deferrals of delivery can be mitigated as works are brought back into the pipeline when available funding allows for it.

Urgent Works

The domestic hot water reticulation system in the Main Hospital Building at Auckland City Hospital is at high risk of failure and needs to be addressed urgently.

On 21 July 2024 a Polypropylene Random Copolymer pipe failed leading to a significant flooding event in the Emergency Department. The local failure was repaired however, this type of pipe is installed all throughout the building and is known to develop leaks within five to ten years from installation. Repeat events could result in a catastrophic failure in the system, whereby the entire building could lose supply. Most of the isolation valves do not work, so it is not possible to undertake localised repairs in many areas in the event of a leak i.e. the entire building may need to be drained of water in an unplanned event.

A change request is underway to fund the initial works to install a new rising main, replace the existing ring main headers and isolation valves from Tranche 1. This work will take between 12 to 18 months to complete, stabilising the system and will enable isolations to be undertaken within the building, in the event of any further leaks.

While this is occurring, s 9(2)(f)(iv)

1.5 Financial Case

The estimated capital cost of the recommended option is s 9(2)(b)(ii), with Table 3 outlining the summary breakdown.

Table 3: Estimated capital costs

Item	Value (\$000)
Construction	s 9(2)(b)(ii)
Construction Contingency	
Fees	
Technical and Internal Resource	
Programme Contingency	
Escalation	
Total	

The incremental operating costs are estimated at s 9(2)(b)(ii), s 9(2)(f)(iv), with Table 4 outlining the summary breakdown.

Table 4: Estimated incremental operating costs

s 9(2)(b)(ii), s 9(2)(f)(iv)

It is proposed that funding is provided from the Health Capital Envelope and Health New Zealand as per Table 5.

s 9(2)(b)(ii), s 9(2)(f)(iv)

It includes **net utility savings of approx. \$11.451 million** which are largely due to the alternative heating components included in the investment. These include replacing the steam heating systems of two buildings on the Auckland City Hospital site with electric heat pump systems. As a comparison, the estimated utility savings over 20 years is s 9(2)(b)(ii), s 9(2)(f)(iv)

As well as achieving emissions reductions, this materially reduces natural gas and carbon charges.

1.6 Commercial Case

The New Zealand economy has seen a decline in growth rates and both business and consumer confidence are at low levels. There is both opportunity and risk in this economic environment as the buyer of services – tender responses are more competitive as there is less opportunity in the market for work. However, there is increased risk of liquidation events as some companies struggle with cash flow.

Typically, the type of work that FIRP delivers is less attractive to the market as contractors generally consider works in existing hospital environments to be particularly challenging. The requirements for staging, processes for delivery, extensive approvals requirements, and working on a live hospital site limit the capability pool of the subcontractor market. In the Auckland context there are several large-scale projects underway that have absorbed a significant proportion of industry resources. Consequently, it is important that the bundling and release of tenders to market are done in an attractive manner.

However, due to the current state of the economy it is expected that market responses to tenders will be higher and more favourable than normal, as there are less opportunities elsewhere in the market for suppliers to invest their time into.

There is no single procurement/delivery approach for FIRP, as there are several workstreams with varying levels of complexity. This means that the approach to the market will differ from project to project. The methods for approaching the market to undertake works will fall into one of the following categories:

- **Secondary procurement via the existing consultant and procurement panels:** Consultants and contractors on these panels are already prequalified, having significant onsite experience and knowledge. The panels are typically used for low to medium size and risk projects.
- **Large, high risk, or complex projects:** The market will be approached via the Government Electronic Tender Service and will typically be a one-stage procurement unless there is a high level of complexity, in which case it will likely be a two-stage process. For larger tenders, a separate probity auditor is present at all procurement meetings.
- **Low risk and/or low value works:** Direct procurement will be undertaken with incumbents with quotes requested from at least two suppliers where possible.

1.7 Management Case

Tranche 3 will continue to implement the project management methodology that has been used to successfully deliver Tranche 1 and 2. This approach has been documented in full in the FIRP Programme Execution Plan.

The governance arrangements described in the Programme, Tranche 1 and 2 business cases have been revised to reflect the establishment of Health New Zealand Infrastructure Investment Group. The Senior Responsible Owner is ultimately accountable for the successful delivery of Tranche 3 and chairs the Project Steering Group, which provides strategic direction and governance functions in support. The FIRP Senior Leadership Team is led by the Programme Director and is responsible for the implementation of the various strategies and plans.

Tranche 3 projects will be delivered utilising a workstream and project approach. Each project will have a “Tight-5” comprising the core members (Workstream Manager, Project Manager, Client

Representative, Quantity Surveyor, and Commercials/Contracts Manager). Workstream Managers will be established and will be supported by the FIRP team and other specialist consultant roles.

Key Dates and Milestones

Forecast timings for delivery of the recommended options are summarised in Table 6.

Table 6: Indicative Workstream Timings

Workstream	Forecast Commencement	Forecast Completion
ASW.30 High risk/highly critical assets	April 2025	June 2027
ASW.31 Sitewide Electrical Resilience	April 2025	December 2027
ASW.32 Alternative Heating	April 2025	April 2027
ASW.33 Technology Upgrades	April 2025	August 2026
ASW.35 Asbestos Removal	April 2025	November 2026

Timings will be confirmed as project designs are finalised and all works are intended to be delivered by the end of December 2027.

Key Stakeholders

The key stakeholders engaged in the development of this business case include Te Toka Tumai Auckland staff (Security, Emergency Management, Fire and Evacuation) and clinical services, Health New Zealand | Te Whatu Ora Hospital & Specialist Services and Data & Digital, and consultant/contractors (architects, engineers, design consultants, incumbent contractors, and utility providers). Key external stakeholders include iwi, Auckland Council, Auckland Transport, St John, New Zealand Fire Service, WorkSafe New Zealand, and patients and visitors. The programme has previously engaged with the Ministry of Health | Manatū Hauora and the Infrastructure Commission | Te Waihangā.

Lessons Learnt

Recent lessons learnt have been applied in planning the investment and proposed approach. These include the need for dedicated health infrastructure project management, adequate resourcing, and specialist contractors, the challenges of accurate cost estimation, the importance of risk allocation and management, the need to manage for quality outcomes, and the necessity of agreed delegations.

1.8 Confidence in Information

The level of confidence in the information contained in the business case is:

- Financial data: Medium – due to the stage of design (feasibility).
- Ability of the market to deliver: High – based on Tranche 1 and 2's history on delivery.
- Ability of the proposed solution to satisfy requirements: High – as there are significant long-term saving and benefits.

1.9 Next Steps and Investment Request

This business case follows the Treasury Better Business Case guidance and is organised around the five-case model. The purpose of this business case is to:

- Confirm the strategic context and fit of the proposed investment.
- Confirm the case for change and the need for investment.

- Identify the recommended option for further development.
- Identify the delivery arrangements required for successful delivery.
- Seek the approval from the Minister of Health for the Recommended Option.
- Seek agreement in principle on the preferred way forward.
- Seek agreement to commit funds of s 9(2)(b)(ii) in capital costs to the Recommended Option.
- Seek agreement to commit funds of s 9(2)(b)(ii) in operating costs to the Recommended Option over the 20-year life.

2. Programme Update

2.1 FIRP Overall Programme and Scope

Tranche 3 Revised Scope

The programme scope and tranche approach has evolved in response to current site and asset conditions, and revised local, regional¹, and national priorities. The Programme Business Case originally envisioned FIRP to be delivered in five tranches as per Figure 1.

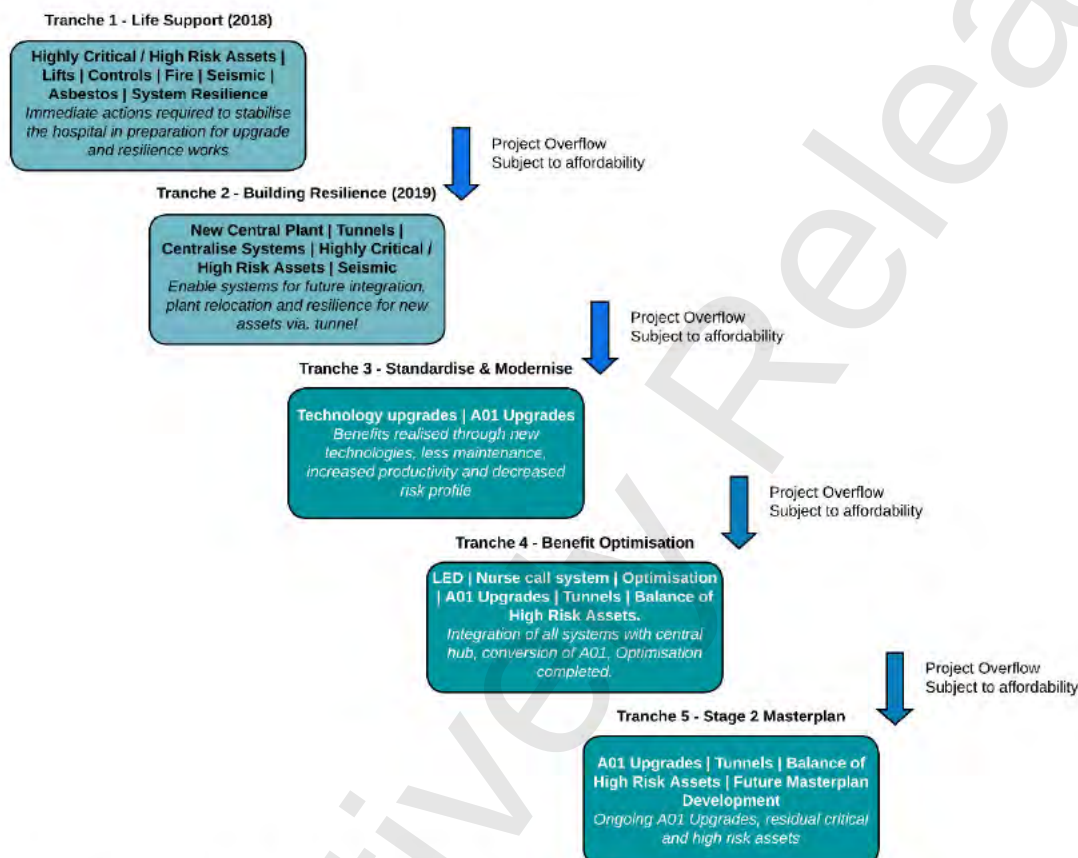


Figure 1: Programme Business Case Tranche Structure

This review has resulted in a revised approach to Tranche 3 which is proposing a single tranche covering Tranches 3, 4 and 5.

This will comprise new scope for site enabling and alternative heating options, some works previously identified for Tranches 3 and 4, and deferred works from Tranche 1 and 2. The final planned Tranche 5 (Stage 2 Master Plan) has been removed from scope, as regional discussions will determine future requirements.

The investment will not complete all works originally proposed in the Programme Business Case and some of the programme benefits envisaged will not be fully realised. FIRP acknowledges that

¹ Most of the proposed works at GCC are on hold pending the determination of the future of the campus, except for essential works to keep clinical services operational.

by delaying investment in some asset remediation previously included in scope, the cost of remediating these assets will be greater when they are addressed in the future. The key factors driving the change in approach for Tranche 3 are summarised in Table 7.

Table 7: Factors Driving Change to Tranche 3

Driver	Summary
Reprioritisation	FIRP can undertake the reprioritisation of scope for high risk and highly critical assets as site conditions change or funding allocations change. s 9(2)(b)(ii) Tranche 3 seeks to address assets that were deferred as part of the reprioritisation activities.
Environmental Sustainability	FIRP has been placed in increased emphasis on sustainability in the delivering of Tranche 1 and 2. In response to Government mandates on decarbonisation, works have been scoped for the alternative heating options of Auckland City Hospital (ACH) by removing reliance upon the existing aged steam boilers and distribution network.
Site Enabling Works	This new workstream consists of a range of projects that are not direct continuations of workstreams from either Tranche 1 or 2. This workstream contributes towards enabling the ACH campus for future development as well as the removal of seismically at-risk buildings and tunnels.
Capital Availability	The likely availability of capital to undertake necessary works has been taken into consideration, given other significant infrastructure investment underway (such as the new Dunedin Hospital, the Regional Hospital Redevelopment Plan, and mental health facilities builds).

Revised Scope Summary

The revised scope of Tranche 3 which will complete the work planned under the Programme Business Case is summarised as follows:

- ASW.30 High Risk/Highly Critical Assets – replacement of the remaining assets that have not been addressed in Tranche 1 and 2, due to reprioritisation of works and/or the macro-economic effects of COVID-19.
- ASW.31 Sitewide Electrical Resilience – completion of the resilience upgrades for the high voltage ring main, sitewide alternative heating options enablement (ring split and transformers), cable compliance upgrades, decommission end of life generators and their replacement, full site resilience for high and low voltage for the full sitewide masterplan for ACH.
- ASW.32 Alternative Heating – transitioning from steam to alternative heating options of ACH, except for the Support Building and Oncology Building.
- ASW.33 Technology Upgrades – installation of sensors on critical assets across ACH and Greenlane Clinical Centre (GCC) to monitor asset performance, the development of the Reliability Centred Maintenance platform and the communication upgrades for emergency systems to ensure compliance.
- ASW.34 Sitewide Remediation – removal of the seismically at-risk existing Central Plant Building and associated tunnels. The chimney will also be removed, and the surrounding roads and footpaths will be remediated.

- ASW.35 Asbestos Removal – removal of asbestos where required in support of the other workstreams.

Excluded/Deferred Scope

In determining the proposed revised scope for Tranche 3, some workstreams/projects previously expected to be delivered in Tranches 3 and 4 have been omitted. The excluded and deferred scope and the rationale for exclusion is summarised in Table 8.

Table 8: Excluded/Deferred Scope

Original Scope	Rationale for Exclusion/Deferral
LED lighting	Removed from scope. A separate business case for undertaking LED lighting upgrades was approved and the works are underway.
ASW.26/GSW.06: Nurse Call System	Data and Digital are responsible for nurse call systems.
ASW.27: Tunnel to future Starship	The site masterplan is not finalised. There is no requirement for the tunnel at this stage.
A01.01: Upgrade support building	s 9(2)(f)(iv)
GSW.09: Site wide plant GSW.10: Seismic upgrades GSW.11: Passive fire protection GSW.12: Site wide electrical GSW.13: Fire system upgrade	The majority of works at GCC that are not critical to keep the site running have been excluded from Tranche 3 scope, as the masterplan for the campus (and its final intended use) is yet to be determined. However, where there is an unacceptable level of risk to clinical service, works have been included within Tranche 3.

2.2 Tranches 1 and 2 Benefits Realisation

Workstream and Project Benefits Realised

FIRP benefits to date are summarised in Appendix 1. Some highlights include:

Reduced risk of asset failure:

- A marked reduction in the overall Operation Risk Rating (ORR)². The criticality and likelihood of failure ratings were combined to generate the ORR for each asset. This represents the relative risk of failure under normal circumstances. The risk ratings are a coarse grading of the relative operational risk posed by individual assets, based on consideration of a number of risk factors. They do not reflect a precise estimate of the real operational risk associated with each asset. In particular, ASW.11 (High risk and highly critical items Tranche 1) has realised a reduction from 4,885 to 2,737 points. FIRP is on track to achieve the end target of 1,872 points at the completion of all the Tranche 1.



² The risk assessment of assets during the audit and investigation phases of FIRP established a set of criteria (criticality and likelihood of failure), resulting in an overall ORR. Refer [ADHB Grafton Infrastructure Services review – Final Report 11 March 2016, Beca](#)

- The new Substation P has reduced the risk to the integrity of the power network from an unforeseen failure event requiring extended power outages.
- Reduced cyber/operational risk, and increased access to more accurate graphical and geospatial site information.
- Reduced risk of failure for water services pump assets, medical gas and vacuum services, and cold-water services reticulation originating from the oncology water tanks. Components are more robust, and spares are readily available. Pipework reticulation has been upgraded from failing and damage-prone asbestos cement pipework to new polyethylene pipework. Ring main systems have been extended to improve overall site resilience and future growth capability. The risk of ongoing failure and outages caused by accidental damage have been significantly reduced.
- Reduced likelihood of/consequences from failure of heating, ventilation and air conditioning (HVAC) assets and/or services. The air flow to the Cardiac Catheterisation laboratory and radiology has been improved and new air conditioning units installed for Te Whetu Tawera (mental health building).
- Fewer prolonged/unplanned outages, due to increased reliability of new emergency lighting uninterruptible power supply and batteries in a temperature-controlled environment.
- Reduced in-ground risk and enabled future programme efficiencies, by relocating utilities prior to commencement of main new Central Plant and Tunnel works. Increased resilience of the site inground services enables faster response to unplanned outages and damage by utilising alternate supplies.
- Substations C, D, H, and R have been addressed, replacing old under-rated cabling to reduce the potential for High Voltage (HV) power outages. The site load is being shared progressively across new assets, further reducing the likelihood of outages. Some of the planned disruptions during these works have uncovered issues (such as impacts on the essential network from non-essential works) that have been rectified or mitigated, again significantly reducing the likelihood and impact of future failures.

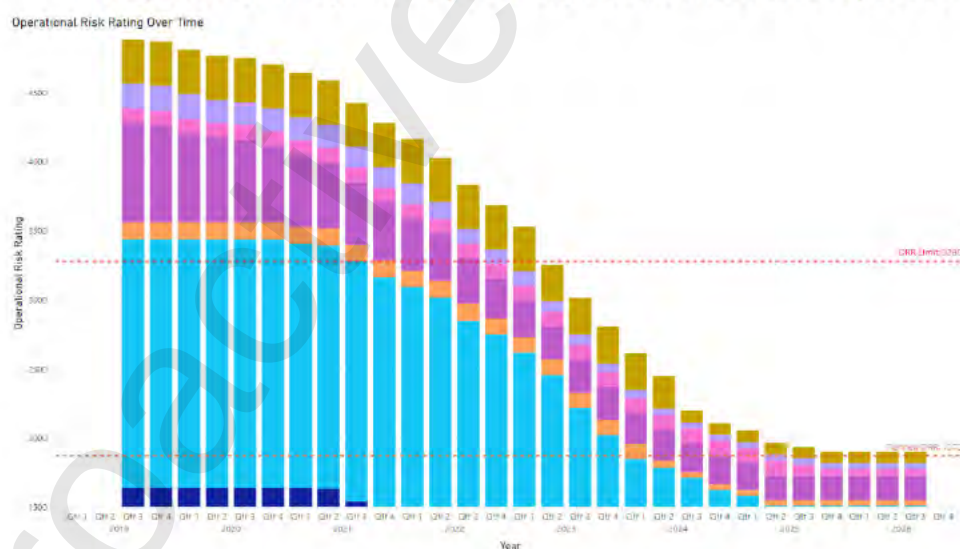


Figure 2: OOR Reduction Profile for Tranche 1

Improved environmental sustainability:

- 
- Improved cleaning and hygiene of cool store due to new floor finishes and upgraded exhaust hood and ventilation. Improved cool store layout and separation from loading dock. Improved efficiency of the chiller system due to new purpose-built refrigeration panel construction and modern efficient cooling system. (The relocation of the cool store was required as enable works for the construction of Tranche 2 services tunnel).
 - Cytotoxic delivery via new purpose-built facility that includes sustainability design elements such as utilising rainwater harvesting, an electric delivery vehicle and charging facility, energy efficient light emitting diode lighting, a solar multi-panel roof system, and optimised HVAC systems.
 - Improved overall site efficiency and energy reporting through the upgraded Building Management System (BMS) works done to date. The ability to interrogate the site wide systems more accurately allows for more efficient maintenance and operational outcomes.

Improved patient and whānau safety, quality, and experience:

- 
- As of March 2024, 47 of 50 lifts and an escalator replaced with more modern, responsive, and reliable units. This means less wait time for patients and staff, and a more reliable service. Technical callouts and entrapments at Auckland City Hospital (ACH) were halved between January 2020 and August 2022 and cost savings delivered due to improved energy efficiency.
 - Significant improvement of Cytotoxic delivery via new purpose-built facility that improves the staff working environment, allows for safer handling and manufacturing in line with current international standards, improves flexibility and increases capacity to match demand and utilises stringent quality assurance and control measures to maximise safe manufacture and distribution.
 - Significantly reduced risk of electrical or water supply interruption. These are key services required to operate an acute hospital facility.
 - Upgraded BMS system enabling more data and analysis of the campus HVAC systems to fine tune the comfort conditions for staff and patients.
 - New cool store allowing improved layout and better separation from the loading dock meaning enhanced food safety and storage in a purpose-built cool store.

Improved cost effectiveness:

- 
- Improved energy efficiency for lifts and assets.
 - The calorifier upgrade programme is expected to realise savings in the steam usage and overall heating generation costs with less energy used to store hot water in old, inefficient calorifiers.
 - The imminent completion of four substations (C, D, H, and R) will provide a more balanced and efficient site HV network and provide more detailed data on load usage. Whilst this alone is not necessarily going to result in savings, it will provide detailed load profiling and a more balanced site load profile which will result in reduced operational intervention and cost.

Greater site and asset knowledge:

- Improved site load and capacity information is available, enabling more efficient site infrastructure management.
- Where advantageous, FIRP is using Facilities Services Management Agreements, to improve the knowledge of the facilities maintenance team as it relates to the new works and assets. By having onsite personnel from the contractor who are familiar with the works and equipment installed, they can provide ongoing training and support to the facilities maintenance team during the enhanced Defect Notification Period.
- Building model and master floor plan, digital surveys completed, asset system replaced and information updated.
- More detailed understanding of the remaining site assets and their general condition following extensive auditing and reporting carried out for the Tranche 1 and 2 works. This will provide more concise and relevant data to inform the upcoming Asset Management Plan.
- Extensive in-ground services investigations during the works have resulted in a much broader knowledge of existing site, enabling updates to the existing as-built information and enabling future planning to be completed with more certainty around services. New in-ground assets have been captured by 3D survey as part of the as built process.

Works will continue on Tranche 1 and 2 through to the end of 2025 and further benefits will continue to be progressively realised. An example of this is passive fire upgrades, that are being rolled out progressively from building to building in plant room areas as well as critical egress routes in Main Hospital Building at ACH (staircases and the main public corridors).

Broader Outcomes and Organisational Benefits

In addition to the specific infrastructure benefits planned and realised, FIRP will deliver organisational capability to Health NZ that will support not only to FIRP but also other infrastructure projects. These include:

- **The implementation of the Programme Management Office (PMO) to deliver the works:** This has resulted in a broad cross section of hospital and industry people being co-located covering the breadth of project, clinical and Business as Usual works. The cross-pollination of understanding from Infrastructure Investment Group (IIG) teams to the project management and design teams has strengthened the understanding for all on the complexities of delivering projects within a working hospital environment. It has highlighted to everyone involved the need for working collaboratively in an open communicative environment to make sure the myriad projects and hospital functions impacted are as well informed as possible.
- **The Centre for Excellence in Health Infrastructure programme:** This has been developed to enable future project managers looking for a career in the health sector to be better prepared and informed of the unique challenges of health projects. They are integrated into FIRP and have benefited from the experiences of the wider FIRP team via interaction and formal presentation.
- **The implementation of extensive site digital surveys:** These provide a “digital twin” of the hospital. The digital twin was made by surveying the entire hospital with cameras, drones, and 3D laser scanners, to create a 3D model of spaces within the hospital,

including wards, plant rooms, and tunnels. The project aims to reduce costs, increase operational efficiency, and allow stakeholders to troubleshoot with ease and track assets spatially. Maintenance workers can remotely view plant rooms, drone images can be used for site planning, and the twin allows a virtual 3D walkthrough of the sites. In addition, the dashboard can provide live insights from sensors. This provides much more accurate and reliable “as-built” information to inform operations and maintenance staff and to provide certainty for future projects planning. In 2021, FIRP won the Outstanding Smart City Project for Smart Buildings/Smart Tech Parks for their development of the ACH Digital Twin.

- **The development of a Supervisory Control and Data Acquisition/Controls simulation environment hosted remotely offsite:** This has enabled software and controls logic that operates the power control equipment to be “bench-tested” and proven prior to roll out. This results in a reduced software upgrade risk, enables operational trouble shooting outside of the “live” environment, and allows more surety of outcomes and streamlined integration of new systems and projects. The implementation of a sitewide industrial grade system is uncommon in healthcare facilities in New Zealand and provides a much higher level of security, control, and performance over traditional systems.
- **Data and systems maturity:** The existing asset information was audited to assess completeness, to support standardisation of all information in line with International Organisation of Standardisation and Uniclass standards. This has enabled data to be mapped easily to any asset management platform, decoupling the asset management system from proprietary systems and providers. This will enable a more streamlined migration to an IIG national asset management system in the future.
- **Training and Upskilling:** FIRP has enabled health project delivery experts to upskill the wider market. FIRP has onboarded more businesses, training consultants and contractors on how to deliver health infrastructure projects. Consequently, the industry is in an improved position for delivering health infrastructure projects, as there is a growing pool of resources with relevant experience in the sector to deliver projects in the future.
- **Equity outcomes:** Māori (Pacifica etc.) have been employed to deliver projects, whilst receiving training from the wider FIRP team on how to deliver health infrastructure projects. FIRP has embraced Tikanga and encourages the use of Te Reo Māori as part of the project delivery process. FIRP has implemented Tikanga Māori in key meetings which commence and conclude with karakia, pōwhiri are held for new kaimahi, and ongoing training is provided to assist in the adoption of Tikanga Māori. The number of Auckland IIG employees with Māori ancestry has increased from two to eight, including the new leadership role of the Māori Health Lead.
- **Standardisation of several technical standards and operational processes:** These have been incorporated into Business-as-Usual operations. Gaps were identified in existing standards and process that have been addressed by FIRP, including the standardisation of switchgear, and active fire and BMS requirements. FIRP has also established Project Lifecycle, project controls, and disruption management (event planning) practices for IIG.

FIRP has both led and assisted in implementing changes to how projects are delivered, to align better with the requirements Government Broader Outcomes. Such changes and/or outcomes include:

- **Quality Employment Opportunities:** Pre commencement of FIRP, there were only two IIG employees with Māori ancestry working on FIRP. Since then, the total number of employees with Māori ancestry has risen to eight people (a 300 per cent increase). This includes the new leadership role of the Māori Health Lead. In addition, at least five other

Māori have been contracted to work on the project through FIRP with some of them holding very senior roles i.e., a member of the FIRP Senior Leadership Team.

- **Whakapono & Tikanga Māori:** Working in conjunction with the Māori Health Lead, FIRP has implemented Tikanga Māori throughout various levels within the hierarchy of project delivery from governance functions through to delivery. Ongoing training (upskilling) is being provided to all interested parties, to assist them in the adoption of Tikanga Māori.
- **Upskilling of the Domestic Construction Sector Workforce:** One of key reasons for the establishment of the FIRP was to provide a space for project team members from different parts of the industry to collaborate to deliver healthcare infrastructure projects. There was early agreement that there were too many entrenched incumbents delivering works and that FIRP had a role to play in onboarding more businesses and training consultants and contractors on how to deliver health infrastructure projects. Outcomes include:
 - Diverse Project Management resourcing, with four companies represented in various delivery and senior management roles.
 - Diversification of building services design services from one key supplier to three, improving the track record for companies that have traditionally not worked on site. This provides more options for procurement on future projects.
 - Employment of dedicated specialised resources in cost, risk, programme, and quality management that support and train project teams to deliver better project outcomes.
 - The development and implementation of detailed impact planning for how to deliver works on a 24/7 operational hospital site and training the contractors in the considerations and care that must be taken when working in and around critical equipment and vulnerable persons.
- Additionally, the Centre of Excellence – Health Infrastructure which provides a Master of Engineering Project Management is based at the FIRP. Key FIRP personnel have been invited to lecture students, providing them with real world context on how projects are delivered in the commercial environment. This programme has been extended beyond FIRP to the Northern Region districts and the Waikato region.

3. Strategic Case

3.1 Background

This business case describes the proposed investment in the third phase of improvements to hospital facilities at the ACH and GCC. It builds on the FIRP Strategic Assessment (approved June 2017), the Programme and Tranche 1 business cases (both approved in August 2018) and the Tranche 2 business case (approved December 2019). This Tranche 3 Business Case provides an update on the Programme Business Case, summarises the programme achievements to date, and describes the implementation plan for Tranche 3.

FIRP reduces the risk of service failure of infrastructure at New Zealand's largest public hospital and clinical research facility. These facilities (buildings, fire and electrical, boilers, lifts etc.) are used by all patients and staff. These facilities "keep the lights on 24/7" at the hospital to ensure all clinical services continue to function.

Appendix 1 summarises the full list of supporting documentation used or prepared, that informed the preparation of this business case, which are available upon request.

3.2 Organisational Overview

Te Toka Tumai Auckland provides health and disability services to more than half a million people living in central Auckland, regional services for Northland and greater Auckland, and specialist national services that are not available in other hospitals for the whole of New Zealand. Te Toka Tumai Auckland has an international reputation and is renowned academically as New Zealand's largest teaching hospital. It has an alliance with the University of Auckland and its Faculty of Medical and Health Sciences in the form of the Auckland Academic Health Alliance. Te Toka Tumai Auckland has three major facilities: ACH, GCC and Starship Children's Hospital (located at ACH). ACH is New Zealand's largest public hospital (and only Quaternary Hospital), as well as the largest clinical research facility, playing a key role in advancing national and international research.

3.3 Strategic Alignment

National, Local and Regional Strategic Alignment

The investment aligns with national, regional and sector strategies as summarised in Table 9.

Table 9: Summary of Strategic Alignment

National	Alignment
Pae Ora (Healthy Futures) Act 2022	The Pae Ora Act sets the foundation for a system that is equitable, accessible, cohesive, and people centred. The following health sector principle is identified in Section 7 of Pae Ora (Healthy Futures) Act 2022 within a broader list of principles: (a) the health sector should be equitable, which includes ensuring Māori and other population groups...have access to service in proportion to their health needs. This investment supports the Pae Ora (Healthy Futures) Act 2022 principle of addressing determinants of health, including climate change.
Te Pae Tata Interim New Zealand Health Plan 2022	Outlines the first steps in creating a system that delivers health services that better serve all New Zealanders. This national health system has been designed to enable services to be planned nationally, delivered regionally, and tailored to local needs.

National		Alignment	
		The investment aligns with actions within Te Pae Tata to deliver on Pae Ora expectations ³ .	
		Actions	Investment Alignment
		The health system will reinforce Te Tiriti o Waitangi principles and obligations.	See Section 3.2.
		Everyone will have equitable access to high-quality emergency and specialist care when they need it, wherever they live.	Increased resilience of critical infrastructure will reduce the risk of failure impacting access to care.
Government Policy Statement on Health 2024-2027		Sets out the Government's priorities for the public health sector. There are five priority areas identified. This investment specifically aligns with: • Infrastructure – ensuring that the health system is resilient and has the digital and physical infrastructure it needs to meet people's needs now and the future. • Without resilient physical infrastructure the other priority areas would not be able to be met. • Access – ensuring all New Zealanders have equitable access to the health care services they need, no matter where they live. • Timeliness – making sure all New Zealanders can access these services in a prompt and efficient way. • Quality – ensuring New Zealand's health care and services are safe, easy to navigate, understandable and welcoming to users, and are continuously improving. • Workforce – having a skilled and culturally capable workforce who are accessible, responsive, and supported to deliver safe and effective health care.	
Te Tiriti o Waitangi		See Section 3.2.	
Infrastructure Investment Plan		At the time of writing, the document was not confirmed.	
Living Standards Framework		Health is arguably the single most important aspect of wellbeing – being in good health is important as it sustains our capabilities. For example, good health improves our capability to work, study, care for others and to make best use of our leisure time. FIRP ensures that ACH and GCC has the necessary infrastructure to support all health facilities required to improve health for the local population.	
National Clinical Services Plan		The health system will reinforce Te Tiriti o Waitangi principles and obligations. The investment will enable the critical infrastructure to be in place to ensure that everyone will have equitable access to high-quality emergency and specialist care when they need it.	
National Health Strategy		The premise of this strategy is that all New Zealanders will live well, stay well, and get well, in a system that is people-powered, provides services closer to home, is designed for value and high performance, and works as one team in a smart system. This investment will ensure that the infrastructure is in place to support clinical services.	
A Zero Carbon Road Map for		Climate change is a priority and there are a number of actions required by Health NZ including setting and monitoring emissions targets, operational	

³ Some outcomes are not specifically applicable for this investment: (2) All people and whānau will be able to access a comprehensive range of support in their local community to help them stay well. (4) Digital services will mean that many more people get the care they need in their homes and local community. (5) Health and care workers will be supported, valued and well trained for the future health system.

National		Alignment
Aotearoa's Buildings	Carbon Neutral Government Project Te Pae Tata Interim New Zealand Health Plan 2022 Climate Change Response (Zero Carbon) Amendment Act 2019	and embedded carbon emissions, reducing category 1 and 2 emissions by 25 per cent by 2025, and including environmental outcomes and sustainability principles in all procurement contracts. All new large-scale Health NZ infrastructure investments are required to meet the New Zealand Green Building Council 5-Star Green Star accreditation standards. The investment in remediation of critical infrastructure will be designed to meet environmental sustainability principles. It will improve the hospital's ability to operate sustainably without degrading the environment. The project will make all reasonable efforts to contribute to environmental sustainability and emissions targets and seek low-carbon design and construction processes.
Regional/Local		Alignment
Site Master Plan		The investment aligns with the intended ongoing use of the ACH site as a quaternary, tertiary, and secondary facility.

Alignment with Asset Management

Investment is in line with the intended ongoing use of the site and does not conflict with, or compromise, the future development of the site.

Alignment with Climate Change Risk Assessment

The results of the Energy Modelling and Life Cycle Analysis are not available at this stage but will be completed as part of the detailed design. A formal Climate Risk Assessment has been undertaken by the former District Health Boards of the Auckland region, and the findings will be used to inform the designs going forward.

Seismic Risk Assessment

Tranche 3 is not a building rebuild. Seismic consideration for services will be assessed on a project-by-project basis and building/structures that are no longer in use that are seismically at-risk will be removed.

Alignment with Broader Outcomes

The Programme Business Case was approved for implementation in June 2017, well before the formation of Health NZ in July 2022. Much has changed since the programme was first approved, and FIRP has been evolving to adopt the revised values that underpin the delivery of healthcare infrastructure projects.

The strategic objective and government mandated requirements that will be employed by FIRP Tranche 3 are summarised in Figure 3.

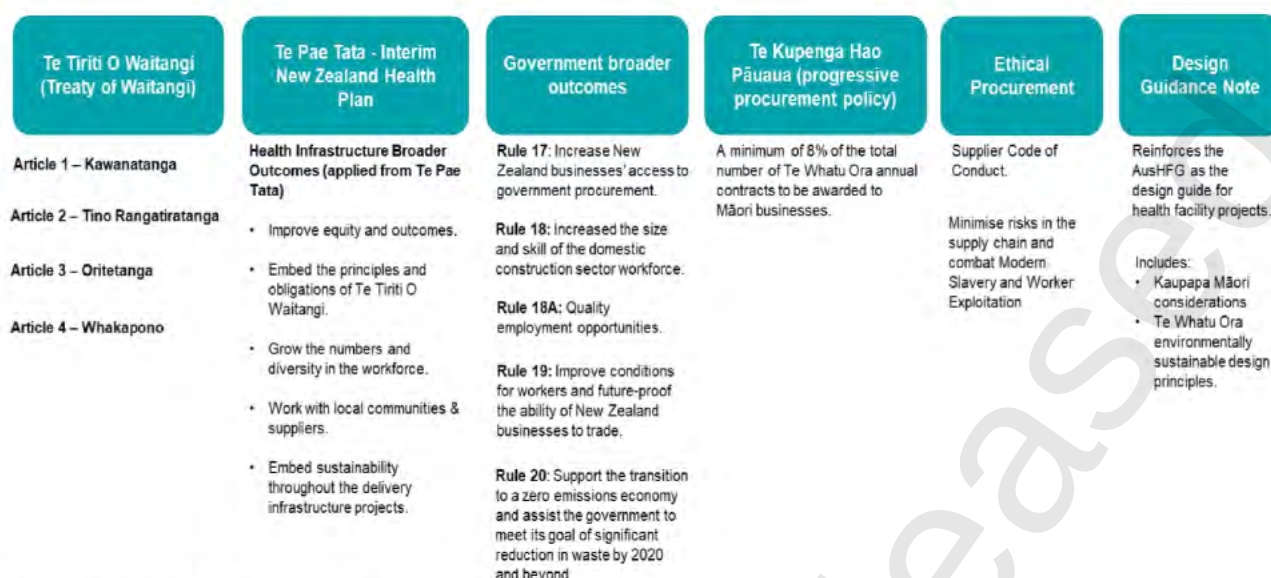


Figure 3: Health NZ Broader Outcomes Regulatory Context

Though measures have been taken to adopt the requirements outlined in Figure 3 for works in Tranche 1 and 2, this strategy was only formally released for implementation in December 2022. Tranche 3 will adopt this strategy fully and will continue to improve on the initiatives that have already been executed in Tranche 1 and 2.

3.4 Te Tiriti O Waitangi and Māori Health Equity

Upholding Te Tiriti O Waitangi

Health NZ recognise that Māori are guaranteed rights under Te Tiriti o Waitangi. This means that attention to Tiriti obligations as a Crown entity is paramount to securing Māori opportunities and health gains. An analysis for Tranche 3 in alignment with the principles of Te Tiriti of Waitangi is summarised as follows:

- **Whakawhanaungatanga | Positive and Collaborative Relationships** – FIRP will continue to intentionally engage with iwi and Māori providers. Specifically, FIRP will partner with the Māori Health Lead to network with iwi and Māori providers to inform and implement FIRP Tranche 3.
- **Kāwanatanga | Governance** – In the context of healthcare, Kāwanatanga is equated to the health system's performance, to facilitate Māori health gain and reduce inequities. In partnership with the Māori Health Lead, FIRP will work to involve iwi and Māori providers in decision making to improve equity.
- **Tino Rangatiratanga | Self-Determination** – In the context of healthcare, Tino Rangatiratanga is equated with opportunities for Māori leadership, engagement, and participation. FIRP will provide opportunities for Māori participation in leadership groups, such as Project Control Groups that have decision making authority, in addition to participation in project briefing and procurement.
- **Ōritetanga | Equity** – In the context of healthcare, Ōritetanga is equated with achieving health equity by reducing systematic inequities in health outcomes and the utilisation of healthcare services. FIRP will include Māori Health Leads at all levels of project governance and work groups, and support Māori knowledge to inform and embed an equity-driven workforce and culture at all levels of FIRP.

- **Whakapono | Beliefs & Values** – In the context of healthcare, Whakapono guarantees Māori the right to practice their own spiritual beliefs and tikanga. FIRP will actively support and honour the beliefs and values of Māori staff and communities.

Te Tiriti o Waitangi and Equity Risk

The risk of Tranche 3 breaching Te Tiriti o Waitangi is low. The underpinning philosophy of FIRP is to remove obstacles that can further entrench inequity by providing reliable infrastructure services that ensure that when the power is turned on there is supply, or when the water tap is turned on that water flows. This ensures that clinical services can be provided on time when promised, reducing waiting times for patient queues if they were otherwise delayed due to infrastructure shortcomings.

Contribution to Equity

The remediation and improvement of infrastructure through FIRP is creating robust and resilient facilities for all users. Whilst infrastructure failures (such as power outages) reduce service capacity for all patients, these failures may have a disproportionately negative impact on Māori, Pacific people and other disadvantaged groups (such as low decile or geographically remote people) that already experience inequities in the healthcare system. Loss of capacity results in disadvantaged groups being further disadvantaged, due to the resulting delays in care.

FIRP is improving reliability (i.e., reducing the risk of infrastructure failure), reducing inefficiencies, and creating the basis for service expansion over time to meet changing and increasing needs. By enhancing the reliability of infrastructure services, inequity in health outcomes is reduced as delays to healthcare services are not caused by ageing infrastructure failure or disruptions.

3.5 Key Stakeholders

The key stakeholders for Tranche 3 and engagement to date are summarised in Table 10.

Table 10: Stakeholder Engagement to Date

Stakeholder	Involvement to Date
Internal	
Clinical services and Te Toka Tumai Auckland staff (including Security, Emergency Management, Fire and Evacuation)	Engagement continues based on the processes that have already been established for FIRP. Specific Clinical Liaison Briefs prepared for each project are used as the basis for ongoing engagement with impacted stakeholders.
Health NZ Hospital & Specialist Services	
Health NZ Data and Digital	Will continue to be engaged in the same way as their predecessor (healthAlliance) was previously. Collaborative planning in the design of Tranche 3.
Architects, engineers, design consultants, contractors, incumbent contractors	Consultants are engaged as needed and are key stakeholders for the delivery of projects. Various engineering consultants and contractors have been engaged to support the preparation of the Tranche 3 business case.
Utility providers – Vector (electrical and gas), Watercare (water), Equipment suppliers	Utility providers have been key stakeholders in the delivery of Tranche 1 and 2 but will be less engaged in Tranche 3 as most of the work is completed in Tranche 1 and 2.

Stakeholder	Involvement to Date
External	
Iwi	The Programme is engaging through the Iwi Māori Partnership Board.
Auckland Council	Engagement will continue as and where projects require input, building consent or resource consent.
Auckland Transport	Engagement will continue as and where needed if projects impact upon roading corridors controlled by Auckland Transport.
Emergency planning, St John, New Zealand Fire Service, WorkSafe New Zealand	Engagement will continue as and where needed if projects impact upon emergency vehicle access.
Ministry of Health	Previous engagement on the overall FIRP approach, indicative programme costs and timeline.
Infrastructure Commission	Previous engagement on the overall FIRP approach, indicative programme costs and timeline.
Patients and visitors	Projects have not engaged directly with patients and visitors but will take their needs into account.

3.6 Problem Definition

The need for investment in facilities and infrastructure remediation, as detailed in the Strategic Assessment and Programme Business Case, remains valid. These drivers are strengthened by the imperative to progress alternative heating options, in line with the Governments goal to reduce carbon emissions. This is reflected in the refinement of 'Better, safer environment' benefit, which now includes specific Key Performance Indicator (KPIs) and measures for decarbonisation.

The drivers for investment and expected benefits are summarised in Figure 4.

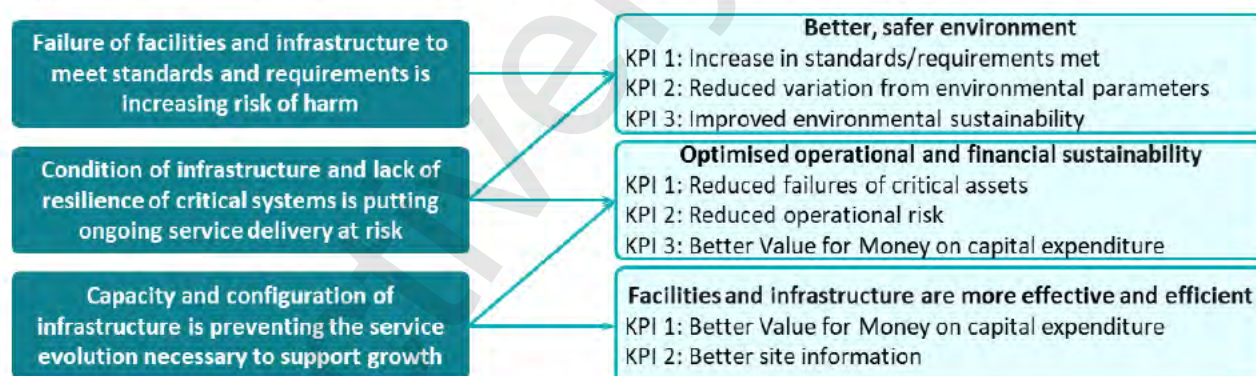


Figure 4: Drivers for Investment and Expected Benefits

The main drivers for investment are as per the Programme Business Case and remain unchanged as follows:

- The condition of infrastructure and lack of resilience of critical systems is putting ongoing service delivery at risk.
- The capacity and configuration of infrastructure is preventing the service evolution necessary to support growth.
- The failure of facilities and infrastructure to meet standards and requirements is increasing the risk of harm.

3.7 Investment Objectives

The investment objectives for the initiative remain unchanged from the original Investment Objectives laid out in the Programme Business Case. The investment objectives and business needs are summarised as follows.

Investment Objective 1

To minimise risk to ongoing service delivery at ACH and GCC, by ensuring facilities infrastructure is operational and at a lower risk of failure as each project is completed. The business needs are:

- To ensure critical infrastructure is safe and operational to support ongoing clinical service delivery.
- Fit for purpose, well-maintained facilities infrastructure.
- A greater ability to monitor equipment, to enable proactive management and avert failure.

Investment Objective 2

To remediate critical facilities infrastructure at ACH and GCC, to a level which enables planned growth and changes in usage to be delivered, in line with the proposed site masterplans. The business needs are:

- Additional capacity in critical areas, to sustain existing services and to permit further investment in service growth and/or redesign, with relocation of some infrastructure to better place it for expected future growth and site development.
- Alignment of investment in infrastructure with planned investment in other services (e.g. cancer facilities).
- Ensuring the Greenlane Clinical Centre is well-placed to respond to regional requirements as the longer-term regional planning is determined.

Investment Objective 3

To improve compliance with current legislation for the facilities infrastructure remediated at ACH and GCC, as each project is completed. The business needs are:

- Ensuring that, as far as possible, all areas impacted by the projects within the FIRP are upgraded to meet current standards and requirements.
- Reducing the potential for harm to patients, staff, and visitors by achieving compliance wherever possible.

Investment Objective 4

To achieve greater cost-effectiveness of facilities infrastructure wherever new or replacement assets are deployed at ACH and GCC, as each project is completed. The business needs are:

- Wherever equipment/infrastructure is replaced, this is with new modern, fit-for-purpose infrastructure which is more cost-effective to operate. Reduced power bills associated with replaced infrastructure/equipment.
- Better value for investment in capital expenditure, by increasing the proportion of proactive versus reactive maintenance.
- Better site information and documentation, to reduce costs on individual projects.

3.8 Benefits and Disbenefits

Each workstream within Tranche 3 will deliver project-specific benefits and disbenefits (refer to Appendix 1). The overall benefits of Tranche 3 are described below.

Benefits

Tranche 3 contributes to the overarching benefits realisation of FIRP, as described in the Programme Business Case. The benefits of investing in facilities remediation are expected to be significant, primarily in reduced risk of harm to patients and ongoing operational service delivery. The main benefits of this investment include:

- **Optimised operational and financial stability:** The most prominent benefit will be a reduction in the ORR for ACH and GCC for the remaining deferred high risk and highly critical assets, leading to a reduced risk of harm. Investment in facilities and infrastructure will be better value for money as proactive rather than reactive maintenance will reduce unplanned outages and the negative impacts on services and patients.
- **A better, safer environment:** The investment will bring facilities infrastructure more in line with current standards and requirements. Tranche 3 will improve safety for maintenance and facilities staff, as aged steam systems will be removed from plant and tunnel areas, and seismically at-risk tunnels and existing Central Plant Building will be removed. Further improvements in understanding of the site infrastructure will enable earlier intervention to prevent issues (this reduces the risk to services and also staff by avoiding more hazardous work later when the infrastructure fails).
- **More effective and efficient facilities and infrastructure:** Improved site information, with enhanced monitoring through Reactive Centred Maintenance, improving building safety and reducing the risk of asset failure. Increased resilience of the high voltage and emergency generation network, to cater for current and predicted future loads. Transfer from fossil fuel to electrical energy heating source utilising heat pump technology, significantly improving carbon footprint and site resilience, while providing significant savings to the utilities bill. This aligns with the Government mandate to reduce carbon emissions.

Environmental Sustainability

Specific actions to meet environmental sustainability requirements include:

- The reuse of existing systems and materials where viable.
- The minimisation of construction waste by recycling and diversion from landfill.
- A materials selection process that considers embodied carbon and environmental sustainability.
- The consideration of environmental outcomes and sustainability principles in all procurement contracts.
- Reducing/eliminating the use of fossil fuel for Heating Hot Water and Domestic Hot Water. The continued use of fossil fuels is contrary to the Government mandate to transition to carbon-neutral energy sources and reduce carbon emissions. Sustainable and energy efficient alternative solutions include:
 - **Air Source Heat Pumps:** Can provide Heating Hot Water at “low” hot water temperature (45 - 55°C), medium (60- 65°C) and high temperature (70°C to 90°C). Due to the higher temperature lift, high temperature heat pumps are less efficient to run, while low temperature heat pumps are highly efficient.

- **Alternative Boiler Fuel technology:** It is unlikely that biomass and hydrogen-powered boilers can operate effectively in the future, due to efficiency and logistics issues.
- **Solar hot water:** As the roof spaces across the site generally have not been occupied, solar thermal collector systems can be installed to incorporate with the Domestic Hot Water heat pump systems to provide further energy enhancements. Photovoltaic panels can also be located on the roof to generate power.
- **Electric heating:** Electric boiler (or electric steam generator) and electric heating elements installed within the existing ductwork are low capital cost options to replace the steam but will have higher running costs. These will be used on an as-needed basis where heat pump technology does not enable higher temperature water supplies e.g., for Central Sterile Supply Department (CSSD).

The impact of Tranche 3 on environmental sustainability is shown in Figure 5.

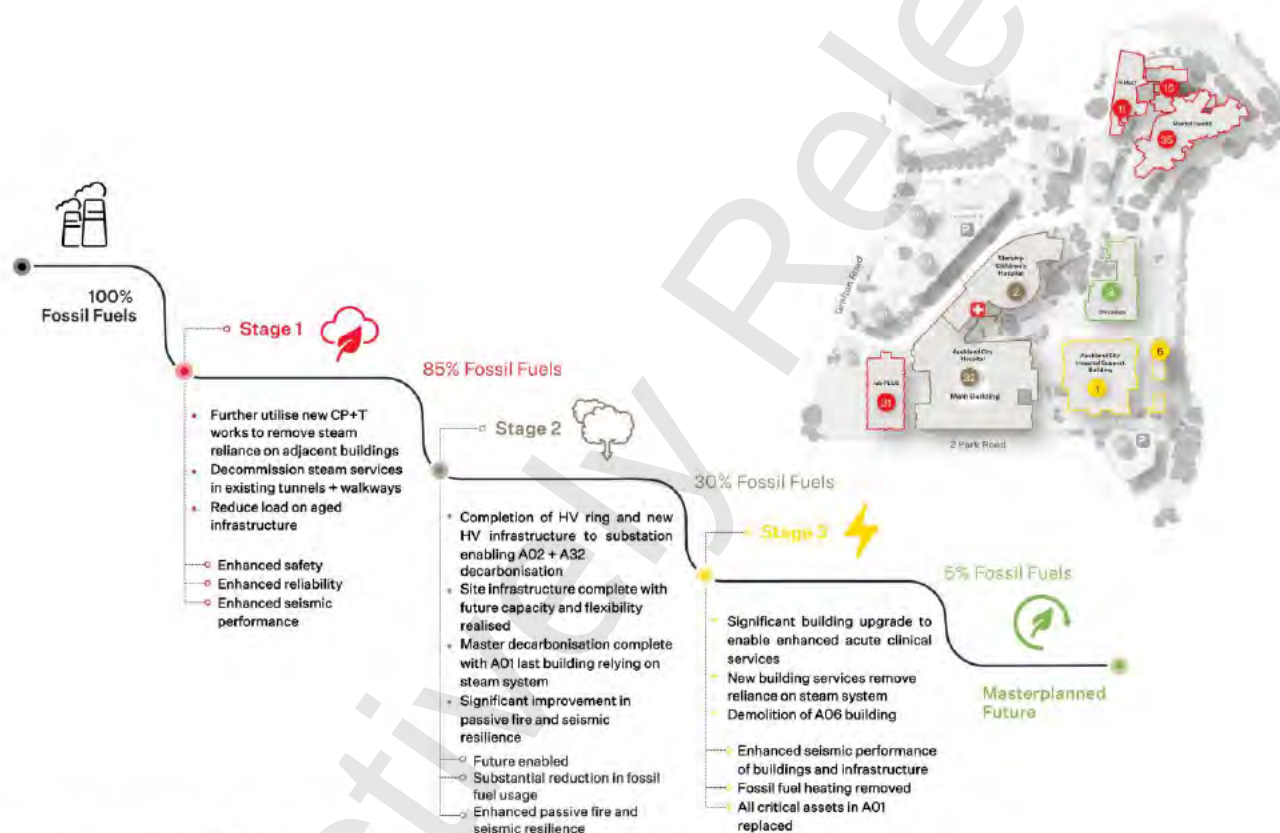


Figure 5: Impact of Tranche 3 on Environmental Sustainability

Completing all the planned scope of work for FIRP, as intended in the Programme Business Case has been calculated to realise extensive benefits related to both carbon and cost savings. This is a consequence of adopting proven technologies that are both more efficient and environmentally sustainable. Forecast benefits for all FIRP are as follows (over 20 years to 2045):

- Carbon emission reductions – 78,000 tonnes of carbon emissions saved.
- Natural gas consumption – 397,000 megawatt hours saved.
- Electricity consumption – 3,700 megawatt hours saved.

These efficiencies will reduce the burden on operational expenditure, and cumulatively is forecasted to save \$75 million in utilities over 20 years to 2045.

Unquantified Benefits

Further benefits from the investment are anticipated that cannot easily be quantified but which nevertheless support the case for investment. These include wider social and economic benefits that are of value to New Zealand. These unquantified benefits include:

- **Natural environment:** Tranche 3 will be designed to meet environmental sustainability standards and will contribute to the hospital's environmental sustainability goals. FIRP will consider the impact of the investment on the physical environment and will seek to mitigate the impact during the build, operation and maintenance phases. This will help Health NZ achieve its environmental goals, by improving the efficiency of plant and equipment at ACH and GCC and reducing carbon emissions and the use of fossil fuels.
- **Increased site flexibility and capacity:** completing sitewide electrical resilience will enable further service expansion to meet increasing population demand.
- **Better value for operational expenditure:** Costs will be reduced over the long term by increasing the proportion of proactive versus reactive maintenance, utilising the upgraded BMS capability.
- **Improved site safety and environment:** Reduced potential exposure to asbestos for staff, patients, and visitors.
- **Knowledge and skills:** Increased opportunities for training: e.g., for construction workers.
- **Work, care, and volunteering:** The investment will create short-term construction and project management jobs.

Disbenefits

Whilst each workstream will have its own project-specific disbenefits, there are some disbenefits that are common across most or all of the workstreams. Whilst the disbenefits are important, the long-term benefits outlined above outweigh the short-term disbenefits. The main disbenefits and the minimisation approach, which have been implemented successfully in Tranche 1 and 2, are summarised in Table 11.

Table 11: Investment Disbenefits

Disbenefit	Minimisation Approach
Site disruption: • Reduced access to some areas. • Patients, visitors, and staff will be impacted by the noise and site disruption during the build.	• Maintaining egress paths, code compliance. • Plans for unavoidable disturbance to clear egress routes etc. • Signage and information for staff, patients and visitors to explain the purpose and duration of the disruption.
Service disruption: • Disruption from power outages and service interruptions (water, cooling, heating). • Disruption to CSSD services during transition from fossil fuel to electrical heating source.	• Projects managed in stages, with disruption planning in advance. • Offsite CSSD support as required. Purpose built facilities from private providers will be available to support.
Additional building space:	• Space requirements assessed as part of detailed project planning, and impact minimised through design process.

Disbenefit	Minimisation Approach
- Additional space may be required in some buildings to accommodate replacement equipment. - Additional construction of structure and/or buildings may be required for new plant and equipment layouts.	Requirements have been considered within the project briefs to date and will not impact future master planning or site operational flexibility.

3.9 Risks, Constraints, Dependencies, and Assumptions

Key Risks – Tranche 3

The overarching risks facing the FIRP are summarised in Table 12.

Table 12: Overarching Risks for Tranche 3

Overarching Tranche 3 Risks
If funding is not approved or is delayed, this will result in a slowing down or closure of the FIRP. Assets may fail resulting in service disruption, future clinical demand will not be met, and eventual replacement costs will be higher due to inflation and escalation. Treatments to this risk are: - Funding will be required to undertake critical design/enabling works. Assets that require imminent intervention must be addressed. - Reprioritise other capital projects.
If FIRP is disestablished, this will result in a loss of expertise, an inability to retain existing skilled resource, increased costs to onboard a new team that has no/limited knowledge of how to deliver health infrastructure projects, or of FIRP, increased programme delivery timeframes due to inefficiencies, and increased risk to services due to potential lack of experience. Treatments to this risk are: - Maintain the key roles that relate to the scope of Tranche 3 planned works. - Enable planning/design works to be undertaken during the transition from Tranche 1 and 2 to Tranche 3, so that works can continue while funding approval is awaited. - Utilise FIRP capability to support the Northern Regional capital works, until funding is made available. - Funding will be required to undertake critical design/enabling works. Assets that require imminent intervention must be addressed. - Reprioritise other capital projects.
If there is a serious harm or fatal incident on site while undertaking project works, this may result in potential criminal negligence investigations, and increased costs and programme delays (as works will be halted during a WorkSafe investigation). Treatments to this risk are: - Leverage established processes that promote proactive and collaborative practices. - Continued use of the dedicated FIRP health and safety team for random site verifications and to assist all parties to live the 'no-blame' culture. - Management attendance at health and safety meetings and walks. - Health and safety documentation that outlines requirements and responsibilities. - Detailed task analysis of identified high risk work. - Internal and independent health and safety audits of projects.

Overarching Tranche 3 Risks

Liquidation events of contractors/subcontractors may result in cost increases, programme delays, a reduction in market capacity to deliver works, and a risk of responsibilities and liabilities being confused. Treatments to this risk are:

- Enhanced due diligence prior to the award of contracts and utilisation of market intelligence from Consultants, Government Agencies, etc. to make informed judgements on market risks.
- Personal Securities Register to ensure ownership of goods, so that they are not impacted under a liquidation event.
- Implement reasonable performance and retention bonds.
- Have step-in rights under the contract, to deal directly with subcontractors in a default situation by the main contractor.
- Have Deeds of Continuity in place with key subcontractors.
- Focus on performance requirements and not specific brands.
- Leverage off FIRP team market relationships to gain early warning of potential events.
- Utilise market intelligence from Cost Consultants, Government Agencies, etc. to make informed judgements on market risks.
- Consider temporary favourable payment terms (where appropriate), such as fortnightly payments, to help struggling trades.

Key Constraints, Dependencies and Assumptions

Tranche 3 is subject to constraints (limitations placed on the project from the outset), dependencies (actions or developments upon which success is dependent), and assumptions (assumed to be true but not proven) as summarised in Table 13. Management strategies and registers have been developed and will be monitored regularly during the project.

Table 13: Tranche 3 Key Constraints, Dependencies and Non-Financial Assumptions

Constraint	Notes
Remaining operational throughout the transition period	The construction works will take place in a live operating environment. Disruption must not impact ongoing service delivery to the extent that patient care is compromised.
Affordability and quality	The project must be delivered within the allocated funding, to meet the specified quality levels.
Design and construction capacity	The construction market is under pressure and forward planning is required to ensure the availability of appropriately skilled and experienced construction workers.
Lead times	The potential for supply chain disruption and longer lead times means that FIRP must plan and schedule purchasing to occur in good time to minimise the risk of delay.
Compliance with New Zealand laws and local authority building and resource requirements	All construction works must meet the required standards.

Dependency/Interdependency	Notes and Management Strategy
ASW.30 High Risk and Highly Critical Assets is reliant on completion of Tranche 1 and Tranche 2 works.	FIRP is progressing the existing works under Tranche 1 and Tranche 2. These will be complete by July 2025, in advance of ASW.30 siteworks commencing.
ASW.31 Sitewide Electrical Resilience is reliant on the completion of the Central Plant and Tunnel project, and the commissioning and migration of Substation Q.	The migration of Substation Q will be completed in early 2025. ASW.31 workstream construction is planned to commence in Quarter 3 of 2026, however, construction can commence at any point after the migration of Substation Q is complete.
ASW.32 Alternative Heating Construction activities for the Main Building, Starship and CSSD cannot commence until ASW.31 works are completed.	Construction activities for these buildings is reliant on the planned HV infrastructure upgrades being completed.
ASW.34 Sitewide Remediation Deconstruction of the existing Central Plant Building cannot commence until works are completed in ASW.32.	Steam supply for the site originates from the existing Central Plant Building. As ASW.32 decouples centralised supply and electrifies it per building site, the supply of steam must be maintained until steam transition works are complete.
Non-Financial Assumption	Notes and Management Strategy
Resources (personnel) will be available to support the project design and delivery	Provision for project and change management is included within Tranche 3 costs.

4. Economic Case

4.1 Introduction

The economic case assesses the relative value of investment options for tranche three of the FIRP. Three options have been assessed for what these different investments provide in terms of value for money through assessment against the investment objectives and critical success factors.

The three options have been developed through a detailed scoping, costing, programme and benefits assessment has been undertaken on the proposed scope of Tranche 3 (including option analysis where appropriate) as set out in the Programme Business Case (refer to Appendix 1).

4.2 Optioneering

Three options were considered as follows:

- Option 1 'Do Nothing' – undertake no further works, with FIRP being disbanded at the completion of Tranche 2.
- Option 2 'Do Everything' – undertake the full scope of work as summarised in Section 2.1.
- Option 3 'Do Minimum' – under this option, the full scope of work summarised in Section 2.1 has reduced to focus on the minimum scope required.

Table 14 summarises the differences in scope between Option 2 and Option 3.

Table 14: Options Scope Summary

Workstream	Option 2 'Do Everything'	Option 3 'Do Minimum'
ASW.30 High risk/highly critical assets	• ACH Support Building assets. • ACH Starship assets. • ACH Oncology assets. • ACH LabPlus assets. • ACH Main Hospital Building assets. • GCC Main Hospital Building assets. • GCC Plant building assets.	• ACH Support Building assets. • ACH Starship assets. • GCC Main Hospital Building assets.
ASW.31 Sitewide Electrical Resilience	• Completion of high voltage ring main. • Sitewide alternative heating enabling (ring split and transformers). • Cable compliance upgrades. • Decommission end of life generators and replace. • Full site resilience for high and low voltage for the full sitewide masterplan.	• Completion of high voltage ring main. • Sitewide alternative heating enabling (ring split and transformers). • Cable compliance upgrades.
ASW.32 Alternative Heating	• Full master planning and design. • Removal of steam reliance for Starship.	• Full master planning and design.

Workstream	Option 2 'Do Everything'	Option 3 'Do Minimum'
	- Removal of steam reliance for Main Hospital Building. - Removal of steam reliance for CSSD. - Removal of steam reliance for Te Whetu Tawera (and associated buildings on the same system). - Removal of steam reliance for LabPlus.	- Removal of steam reliance for Te Whetu Tawera (and associated buildings on the same system). - Removal of steam reliance for LabPlus.
ASW.33 Technology Upgrades	- Installation of sensors on critical assets across ACH. - Installation of sensors on critical assets across GCC. - Development of the Reliability Centred Maintenance platform. - ACH communication upgrades for emergency systems to ensure compliance. - GCC communication upgrades for emergency systems to ensure compliance.	- Installation of sensors on critical assets across ACH. - Development of the Reliability Centred Maintenance platform. - ACH communication upgrades for emergency systems to ensure compliance.
ASW.34 Sitewide Remediation	- Removal of the seismically at-risk old Central Plant Building. - Removal/remediation of the seismically at-risk tunnels. - Removal of the chimney. - Surrounding road and footpath remediation.	No works undertaken.
ASW.35 Asbestos Removal	Removal of asbestos where required in support of the other workstreams.	Removal of asbestos where required in support of the other workstreams.

4.3 Evaluation Approach

Investment Objectives and Critical Success Factors

The three options were evaluated against the Investment Objectives and Critical Success Factors as outlined in the Strategic Case and Programme Business Case for FIRP. The Critical Success Factors are outlined in Table 15, while the Investment Objectives are summarised as follows:

- To minimise risk to ongoing service delivery at ACH and GCC, by ensuring facilities infrastructure is operational and at a lower risk of failure as each project is completed.
- To remediate critical facilities infrastructure at ACH and GCC, to a level which enables planned growth and changes in usage to be delivered, in line with the proposed site masterplans.

- To improve compliance with current legislation for the facilities infrastructure remediated at ACH and GCC, as each project is completed.
- To achieve greater cost-effectiveness of facilities infrastructure wherever new or replacement assets are deployed at ACH and GCC, as each project is completed.

Table 15: FIRP Critical Success Factors

Critical Success Factors	FIRP Specific Clarifications
Strategic fit and business needs How well the option meets the agreed investment objectives, related business needs and service requirements, and integrates with other strategies, programmes and projects.	• The defined problems to be resolved and benefits to be realised. • Investment objectives to be met. • Alignment with local, regional and national strategies.
Potential Value for Money How well the option optimises value for money (i.e. the optimal mix of potential benefits, costs and risks).	• Reduction in equipment failures. • Savings on maintenance costs.
Supplier capacity and capability within timeframe How well the option matches the ability of potential suppliers to deliver the required services, and likelihood that it will result in a sustainable arrangement that optimises value for money.	• To deliver the option within the agreed timeframe.
Potential affordability How well the option can be met from likely available funding and matches other funding constraints.	• Affordability to the Crown.
Potential achievability How well the option is likely to be delivered given the organisations ability to respond to the changes required and matches the level of available skills required for successful delivery.	• Feasibility that the Programme team can manage the implementation of the option. • Feasibility that the IIG can cope with the scale of change in the proposed timeframe. • To deliver the option within the agreed timeframe.

Each option was rated against the Critical Success Factor as follows:

- 1 – does not achieve the requirements.
- 2 – somewhat achieves the requirements.
- 3 – partially achieves the requirements.
- 4 – largely achieves the requirements.
- 5 – fully achieves the requirements.

The option with the highest overall score provides that overall best value for money.

Benefits

The evaluation of the options takes into consideration the planned benefits that were established as part of the Programme Business Case, which were derived from the original Investment Logic Map as outlined in Figure 6.

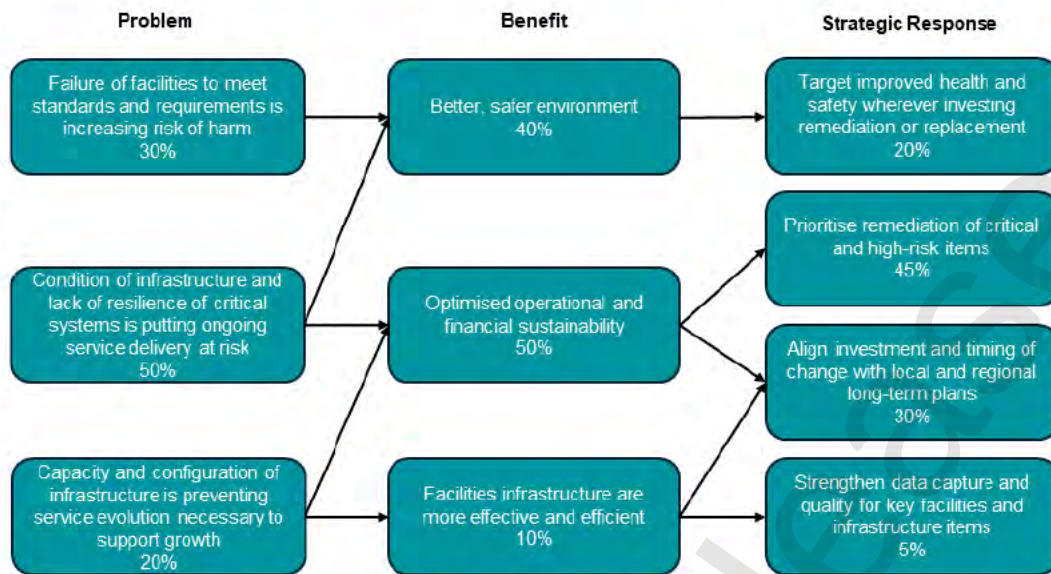


Figure 6: Investment Logic Map

The KPI's that were established for Tranche 1 and 2 that are used to track benefits realisation, will also be used on Tranche 3. There is one exception to this however, whereby KPI #3 'Improved environmental sustainability' was introduced for Tranche 3 to track the benefits of workstream ASW.32 Alternative Heating. Table 16 outlines how the KPI's are related to the planned benefits.

Table 16: Benefits and Key Performance Indicators

No.	Benefit	Key Performance Indicator
1	Better, Safer environment	1. Increase in standards/requirements met.
		2. Reduced variation from environmental parameters.
		3. Improved environmental sustainability.
2	Optimised operational and financial sustainability	4. Reduced failure of critical assets.
		5. Reduced operational risk.
3	Facilities and Infrastructure are more effective and efficient	6. Better value for money on capital expenditure.
		7. Better site information.

4.4 Options Evaluation

The options have been compared against each other as standalone options – the comparative assessments do not consider any benefits and progress that has been realised under Tranche 1 and 2.

When evaluating the options, a multicriteria assessment was undertaken measuring the options against the critical success factors, rather than a cost benefit analysis. This was used because of the need to evaluate the risk mitigated and benefits realised.

Option 1 'Do Nothing'

Commentary of what this option achieves (or does not achieve) against the Critical Success Factors is summarised in Table 17.

Table 17: Option 1 CSF Assessment

Critical Success Factors	Commentary
Strategic fit and business needs	Does not meet requirements – investment objectives and benefits to be realised will not be achieved.
Potential Value for Money	Does not meet requirements – equipment failures and increased maintenance costs will eventuate and escalate as a consequence of this option.
Supplier capacity and capability within timeframe	Does not meet requirements – pipeline of works for suppliers that have worked on Tranche 1 Tranche 2 will be lost, and they will move on to service other clients/ organisations. If required to undertake works due to failures, they may no longer be available, or suppliers will need to be used that do not understand how to operate in the healthcare infrastructure context.
Potential affordability	Does not meet requirements – there is no further funding required under this option however, over time costs will be more expensive as the works will need to be undertaken at some point in future at an escalated/emergency cost rate. This has been assessed on the basis that there is no delivery mechanism (i.e. FIRP) to address critical asset failures.
Potential achievability	Does not meet requirements – as there are no works under this model, there are no constraints.

No additional benefits are realised under this option, with the residual risk and dis-benefits of not undertaking any works summarised as follows:

- The ongoing risk of failure for high risk/highly critical assets, resulting on impacts to clinical service.
- An incomplete resilient high voltage network that does not provide full resilience to New Zealand's hospital of last resort (ACH).
- Continued reliance on carbon heavy fossil fuel/gas boilers which is expensive operationally and dangerous to maintain from a health and safety perspective.
- A full view of the site using BMS to shift from planned preventative maintenance to predictive and Reliability Centred Maintenance will not be achieved.
- Accepting the seismic risk of old building and tunnels at ACH that will not be deconstructed and decommissioned under this option.
- Limited ability to enable future master planning or enhanced clinical activities.
- Loss of the established FIRP team, experience, trusted relationships, operational understanding, project history, and site knowledge.

This option is **NOT RECOMMENDED**.

Option 2 'Do Everything'

Commentary of what this option achieves (or does not achieve) against the Critical Success Factors is summarised in Table 18.

Table 18: Option 2 CSF Assessment

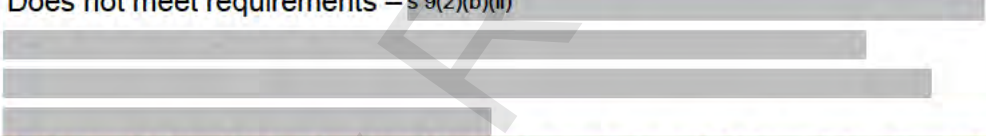
Critical Success Factors	Commentary
Strategic fit and business needs	Fully meets requirements – aligns with the original intent of the Programme Business Case and finished the planned works of FIRP to achieve the intended benefits.
Potential Value for Money	Fully meets requirements – provides the best value for investment as it delivers on the original plan for FIRP and is less costly to deliver in the long term.
Supplier capacity and capability within timeframe	Fully meets requirements – FIRP has been working closely with the market to delivery projects and would leverage off this experience to continue delivering works. Further to this market confidence is low and the number of projects in the market is reduced, meaning that suppliers are competing fiercely to secure work.
Potential affordability	Does not meet requirements – s 9(2)(b)(ii) 
Potential achievability	Fully meets requirements – requirements are fully met if the existing team is used however, if they are not this ranking is reduced. The existing team has a proven track record for delivering projects under FIRP and has been upskilled over the past seven years to operate effectively in this space.

Table 19 summarises at a high level what benefits each workstream contributes to and what KPIs that they are measured against.

Table 19: Option 2 Benefits Realisation

Benefit	Key Performance Indicator	ASW. 30 (assets)	ASW. 31 (elec)	ASW. 32 (heating)	ASW. 33 (tech)	ASW. 34 (decon)	ASW. 35 (asbes)
1	Increase in standards/requirements met.	✓	✓	✓		✓	✓
	Reduced variation from environmental parameters.			✓	✓		✓
	Improved environmental sustainability.	✓		✓	✓	✓	
2	Reduced failure of critical assets.	✓	✓	✓	✓		
	Reduced operational risk.	✓	✓	✓	✓	✓	✓
	Better value for money on capital expenditure.	✓	✓	✓			
3	Better value for money on capital expenditure	✓	✓	✓	✓		

Benefit	Key Performance Indicator	ASW. 30 (assets)	ASW. 31 (elec)	ASW. 32 (heating)	ASW. 33 (tech)	ASW. 34 (decon)	ASW. 35 (asbes)
	Better Site Information	✓	✓	✓	✓		✓

Utility savings under this option are estimated to be just under \$35 million over 20 years vs. a construction cost investment of s 9(2)(b)(ii)

This option completes the work originally intended under the Programme Business Case, provides the most benefits and is the cheapest option for delivery overall, as the works will need to be undertaken at some point in the future if they are not delivered under FIRP.

This option is **PREFERRED** if it was affordable.

Option 3 'Do Minimum'

Commentary of what this option achieves (or does not achieve) against the Critical Success Factors is summarised in Table 20.

Table 20: Option 3 CSF Assessment

Critical Success Factors	Commentary
Strategic fit and business needs	Meets some of the requirements – benefits realised under this approach are only partially realised when compared against Option 2; this is summarised in Table 21.
Potential Value for Money	Fully meets requirements – for the planned scope under this is good value as impactful projects can be delivered early, s 9(2)(f)(iv)
Supplier capacity and capability within timeframe	Fully meets requirements – FIRP has been working closely with the market to delivery projects and would leverage off this experience to continue delivering works. Further to this market confidence is low and the number of projects in the market is reduced, meaning that suppliers are competing fiercely to secure work.
Potential affordability	Fully meets requirements – though this option is fully affordable for the planned scope requested, s 9(2)(f)(iv) this option is more expensive long term than Option 1.
Potential achievability	Fully meets requirements – requirements are fully met if the existing team is used however, if they are not this ranking is reduced. The existing team has a proven track record for delivering projects under FIRP and has been upskilled over the past seven years to operate effectively in this space.

Table 21 summarises at a high level what benefits each workstream contributes to and what KPIs that they are measured against, compared against Option 2. Green reflects that the same level of

benefits will be achieved, amber reflects that some benefits will be achieved and red reflects that no benefits will be achieved.

Table 21: Option 3 Benefits Realisation

Benefit	Key Performance Indicator	ASW. 30 (assets)	ASW. 31 (elec)	ASW. 32 (heating)	ASW. 33 (tech)	ASW. 34 (decon)	ASW. 35 (asbes)
1	Increase in standards/requirements met.	✓	✓	✓		✓	✓
	Reduced variation from environmental parameters.			✓	✓		✓
	Improved environmental sustainability.	✓		✓	✓	✓	
2	Reduced failure of critical assets.	✓	✓	✓	✓		
	Reduced operational risk.	✓	✓	✓	✓	✓	✓
	Better value for money on capital expenditure.	✓	✓	✓			
3	Better value for money on capital expenditure	✓	✓	✓	✓		
	Better Site Information	✓	✓	✓	✓		✓

Utility savings under this option are estimated to be just under \$12 million over 20 years vs. a construction cost investment of s 9(2)(b)(ii), s 9(2)(f)(iv)

Specific comparisons between this option and Option 2 as it relates to planned benefits are summarised as follows:

- ASW.30 High Risk/Highly Critical Assets – this option will realise approximately 32% of the planned benefits for the reduction in the Operational Risk Rating.
- ASW.31 Sitewide Electrical Resilience – all benefits to the high voltage ring and capacity are realised however, the aged and obsolete D3 and D4 generators will remain at risk of failure as they are not replaced under this option.
- ASW.32 Alternative Heating – this option will reduce reliance on fossil fuels on site by approximately 15% vs Option 2's planned reduction of 70%.
- ASW.33 Technology – the benefit is realised for the Reliability Centred Maintenance platform and the minimum sensor install to obtain reliability data to prove the platforms anticipated value.
- ASW.34 Sitewide Remediation – no benefits are realised and the seismic at-risk Building A06 and associated tunnel are left in place.
- ASW.35 Asbestos Removal – benefits will be realised, commensurate with the reduced scope of this option.

It is important to note that though the benefits of this option are significantly reduced when compared against Option 2, that in isolation the benefits that are planned to be delivered in this option will be fully achieved for the reduced scope.