REPORT

Tonkin+Taylor

Frank Kitts Park Redevelopment

Erosion and Sediment Control Plan

Prepared for
Wellington City Council
Prepared by
Tonkin & Taylor Ltd
Date
April 2024
Job Number
1018875.4000 v1

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Document control

Title: Frank Kitts Park Redevelopment					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
6/12/23	0.1	Draft ESCP	M. Comeskey	M Mills	Dr. Eng Chin
19/4/2024	1	Client review	M. Comeskey	M. Mills	Dr. Eng Chin

Distribution:

Wellington City Council	1 PDF copy
Tonkin & Taylor Ltd (FILE)	1 PDF copy

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1 Introduction

This erosion and sediment control plan (ESCP) framework has been developed to provide an overall approach and guidance for the redevelopment of Frank Kitts Park on the Wellington Waterfront. This framework has been prepared based on the preliminary design work carried out to date to support the Resource Consent Application. It demonstrates possible control measures that can be applied to the project. An erosion and sediment control plan (ESCP) specific to the final design and project staging and construction methodology will be prepared prior to commencing construction, by the Contractor appointed to undertake the construction works, for approval by the regulator.

The erosion and sediment control measures in this document have been designed in general accordance with the Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region 2021. It builds on the 2016 Earthworks and Erosion & Sediment Control Measures report prepared by Aurecon in support of the 2016 Resource Consent application.

2 Site details

The site is located on Wellington Harbour waterfront in Wellington central city. The proposed development site is defined by the existing park boundary with Te Whanganui-a-Tara/Wellington Harbour and Whairepo Lagoon to the East and South, Jervois Quay to the West and TSB Arena to the North (refer Figure 2-1 below).

The existing site is largely green space with several mid to large Pohutukawa trees. It is built up in the south over an underground carpark and along the East side with an amphitheatre and concrete walls. The site is cut with two primary paved pedestrian pathways. The children's playground in the North-West is currently under reconstruction and does not form part of this ESCP.

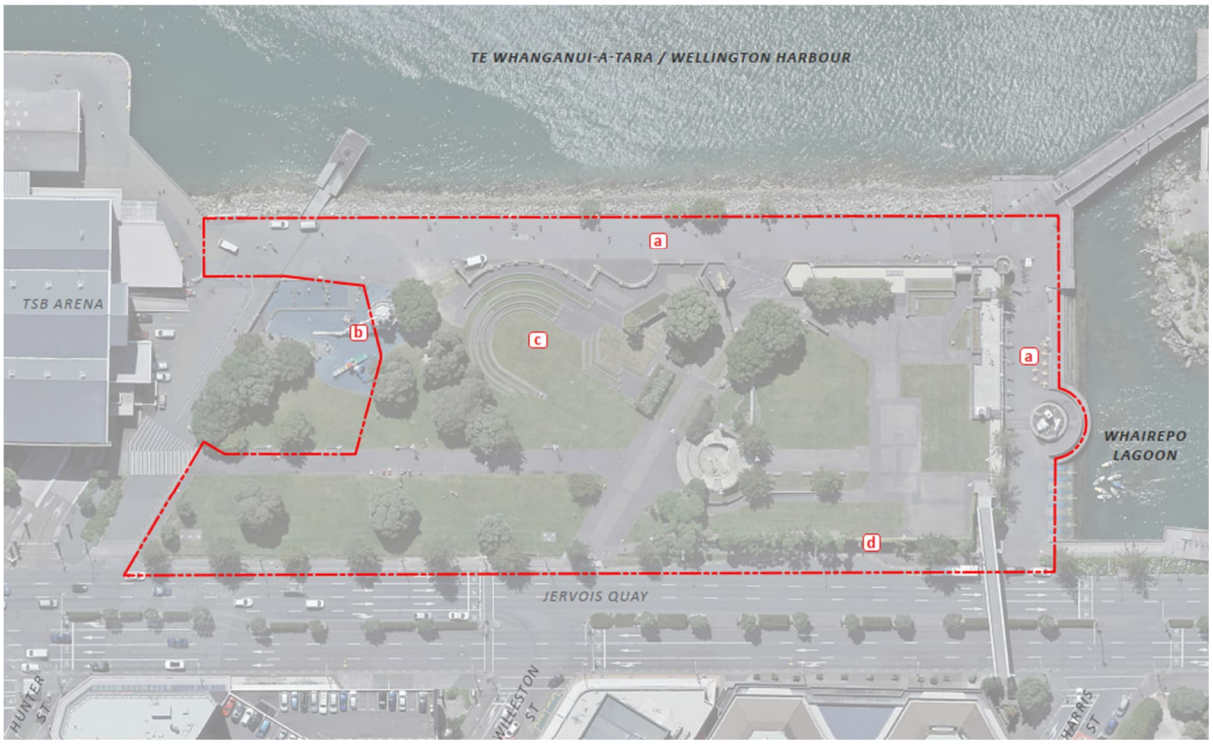

Figure 2-1: Existing park plan (extent of site shown with dashed red line)

Redevelopment of the area aims to retain the value of the existing space with the removal of the underground carpark structure and amphitheatre and improving the parks interface with the waterfront.

The proposed works includes:

- The demolition of the underground carpark
- Garden of Beneficence Chinese Garden
- Fale building
- Malae – a grassed lawn to accompany the Fale
- A larger Harbour Lawn
- Improved pedestrian walkways, paths and sitting areas
- Shifted and improved children's playground
- Maintains the existing Te Ara Moana/Harbourside and Whairepo Lagoon Promenades.

Demolition of the underground car park is outside the scope of this ESCP.

3 Proposed works

3.1 Demolition

As part of the proposed works, the underground carpark and Jervois Quay pedestrian overbridge in the south of the site will be demolished. Several existing landscaping features such as the amphitheatre will also be removed. A Demolition Management Plan has been prepared by Ceres New Zealand for the underground carpark and is attached in Appendix C.

3.2 Bulk Earthworks

Earthworks are proposed to be carried out within an approximate area of 15,600 m^2. Indicative earthworks volumes are as follows:

Description	Approx. Volume (m^3)
Cut to waste off site, material on top of the car park roof structure (assumes 0.5m average depth over concrete structure)	1,000
Demolish and remove car park concrete structure from site	2,200
Cut to stockpile on site, topsoil material from rest of site	800
Demolish and remove amphitheatre concrete steps and walls off site	1,500
Cut to fill, material in and around amphitheatre concrete steps and walls (excl. item 3 above)	3,200
Cut to fill remaining excavation to design levels (Fale basement, rain garden etc.)	800
Import fill material (soil or hardfill)	7,000
Excavate from stockpile and spread topsoil (item 2 above)	800
Import topsoil material	200

An earthworks assessment[1] has been undertaken by Tonkin & Taylor Ltd (T+T) as part of the preliminary design to support the resource consent application which provides further details on earthworks.

[1] Franks Kitts Park Redevelopment, Preliminary Civil Engineering Report, April 2024. T+T Ref: 1018875.4000 v1

4 Erosion and sediment control measures

Erosion control is based on the practical prevention of sediment generation in the first instance. Sediment control refers to management of the sediment after it has been generated. Sediment generation is inevitable during land disturbance activities even with the best erosion control measures in place. However, effective erosion control measures minimise the reliance on sediment control measures. Sediment control measures are designed to capture generated sediment, minimising the amount discharged to waterways.

Below are the ten best practice principles that form the basis for this project's ESCP:

1 Minimise disturbed areas by working only those areas required for construction.
2 Stage construction to minimise time each area is worked.
3 Protect steep slopes by diverting runoff from above.
4 Protect watercourses by separating dirty water from clean.
5 Stabilise exposed areas rapidly.
6 Install perimeter controls.
7 Employ detention devices to capture sediment.
8 Employ trained and experienced Contractors.
9 Continuously update the plan.
10 Inspect, monitor and maintain control measures, especially after a rain event.

4.1 Control measures

Table 4.1 sets out the erosion and sediment control measures considered suitable for this project in accordance with the principles above. For design development and initial construction planning purposes, site appropriate measures are indicatively shown on the Erosion and Sediment Control Framework Plan in Appendix A. The methods implemented for any part of the project are subject to development by the appointed construction Contractor to reflect their methodology and sequencing and the measures indicated may be modified and improved in response to detailed design and site conditions as works progress.

Table 4.1 Erosion and sediment control tool box

Measure	Purpose	Typical project application
Erosion Control Practices		
Staging of works	Limit area susceptible to erosion and dust production open at one time.	Stage works so that exposed ground is kept to a minimum during construction. Stabilise areas as soon as practicable upon completion of works. Maximum acceptable exposed area will be dependent on capacity of sediment control and dust suppression measures.
Stabilised construction entrance	Prevent access points becoming a source of sediment and minimise tracking of earth material offsite.	Placed at site entrances, may also incorporate wheel wash facilities if required.

Measure	Purpose	Typical project application
Temporary or permanent planting, grass seeding and/or mulching	Stabilise the soil and prevent erosion.	Temporary grass seeding where vegetative cover is required for less than 12 months. Topsoil is to be spread and planting, grass seeding and/or mulching completes as soon as possible on exposed surfaces once they have been completed
Water sprinkling	Dust suppression	Use of water carts and irrigation sprinklers on haul roads and fill areas. Cut areas should only require dust suppression for the topsoil layers until rock is encountered
Drum rolling	Smooth/seal exposed soils to promote sheet flow and reduce scouring	Use on cut areas to reduce down time after rain
Mulching with straw or other suitable material	Instant protection of soil from raindrop impact	May be used as a temporary measure if required
Sediment Control Practices		
Silt fences and super silt fences	Detain runoff flows so that deposition of sediment can occur through settlement.	Perimeter fencing will be installed to prevent runoff leaving the site and entering nearby drainage channels and the harbour. Temporary silt fences are to be installed to manage silt laden runoff from temporary on site stockpiles.
Dirty water diversions	Temporary drains and/or bunds which break overland flow and intercept and convey runoff from disturbed catchments to water treatment measures.	Channels or drains will be formed to contain areas and convey runoff towards ponding treatment areas. These drains will intercept runoff before it reaches the silt traps and fences.
Decant earth bunds	Detain runoff flows so that deposition of sediment can occur through settlement.	Primary treatment device for small catchment areas. To be constructed at localised low points on the site. These will store water in rainfall events to allow for soakage and decant release through controlled outlet structures.
Filter traps at stormwater inlets	Trap sediments and rubbish preventing discharge into stormwater network and waterways.	To be installed on the local stormwater drainage inlets near the site.

4.2 Layout

An indicative layout has been included in Appendix A for the proposed works. A silt fence around the perimeter of the site will be used with cut off drains being established within the site to divert flows to sediment treatment devices (e.g. Decanting earth bunds). Refer to Appendix B for typical details.

Exact locations and sizing of the control measures will be confirmed in the detailed construction ESCP prepared by the construction Contractor to reflect the final design, project staging and construction methodology.

4.3 Monitoring, maintenance and reporting

Erosion and sediment control devices will require monitoring and maintenance throughout the duration of the project. Regular inspections of all control measures will be conducted by the

contractor to ensure proper function of the plan. Any issues shall be recorded and addressed as soon as possible as required.

Site monitoring and management of ESCP controls will be conducted through regular site visits by a suitably qualified and experienced person in construction erosion and sediment control. This will typically be completed a minimum of once a week and more frequent during high rainfall events. Site monitoring will identify changing site conditions and continuous improvement opportunities.

4.4 Adverse weather response and contingency measures

Weather forecasts shall be checked regularly by the contractor. Rainfall has a direct effect on the performance of control measures. Short duration high intensity rainfall can have the same, if not worse, effect as continuous rainfall over the entire day. Rainfall events shall trigger monitoring and inspection of structural controls to ensure they are operating effectively and any maintenance requirements. In addition, a plan of measures to be undertaken before forecasted wet weather should be prepared as part of the ESCP.

If a significant rainfall event is predicted to occur outside of working hours (e.g. weekends or public holidays), the site manager is responsible for monitoring the site regularly for the duration of the event to ensure all controls are in place and working properly.

4.5 Decommissioning of structural controls

The removal of structural controls shall occur only after the area serviced by the control has been stabilised. Stabilised is defined as resistant to erosion by applying vegetative or structural practices that will protect the soil and prevent erosion. Common measures include spreading of aggregate, grassing, applying mulch, and use of geotextiles. When vegetation is used, the surface is considered stabilised once an 80% vegetative cover has been established over the entire area of earthworks.

4.6 Reviewing and updating the ESCP

Erosion and sediment controls are dynamic and will change and adapt as the work progresses and new areas are opened up. As this happens, the ESCP shall be updated accordingly. Updates to the ESCP shall be discussed at regular site meetings and the plan updated with any changes that are agreed upon. Any changes or amendments to the plan will need to be approved by a Wellington City Council representative.

4.7 Contamination Site Management Plan

A 2024 Contaminated Land Detailed Site Investigation (DSI[2] completed by T + T recommends a Contamination Site Management Plan (CSMP) is prepared for the earthworks. While soil samples tested indicated concentrations below the applicable soil contaminant, there remains a risk that pockets of hazardous material will be encountered during construction due to the site being on reclamation fill. The detailed ESCP prepared by the contractor prior to construction should reflect controls within the CSMP as appropriate.

[2] Detailed Site Investigation, Frank Kitts Park Redevelopment, Tonkin & Taylor. 19 April 2024

4.8 Applicability

This report has been prepared for the exclusive use of our client Wellington City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent and that Wellington City Council and Greater Wellington Regional Council as the consenting authority will use this report for the purpose of assessing that application.

We acknowledge that the Fale Malae Trust will also submit this report as part of an application for resource consent in accordance with the Reliance Statement[3], and that Wellington City Council and Greater Wellington Regional Council as the consenting authority will use this report for the purpose of assessing that application.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
	
.....	.....
Marina Comeskey	Dr. Eng Chin
Civil Engineer	Project Director

Technical reviewed by: Maurice Mills (Senior Civil Engineer)

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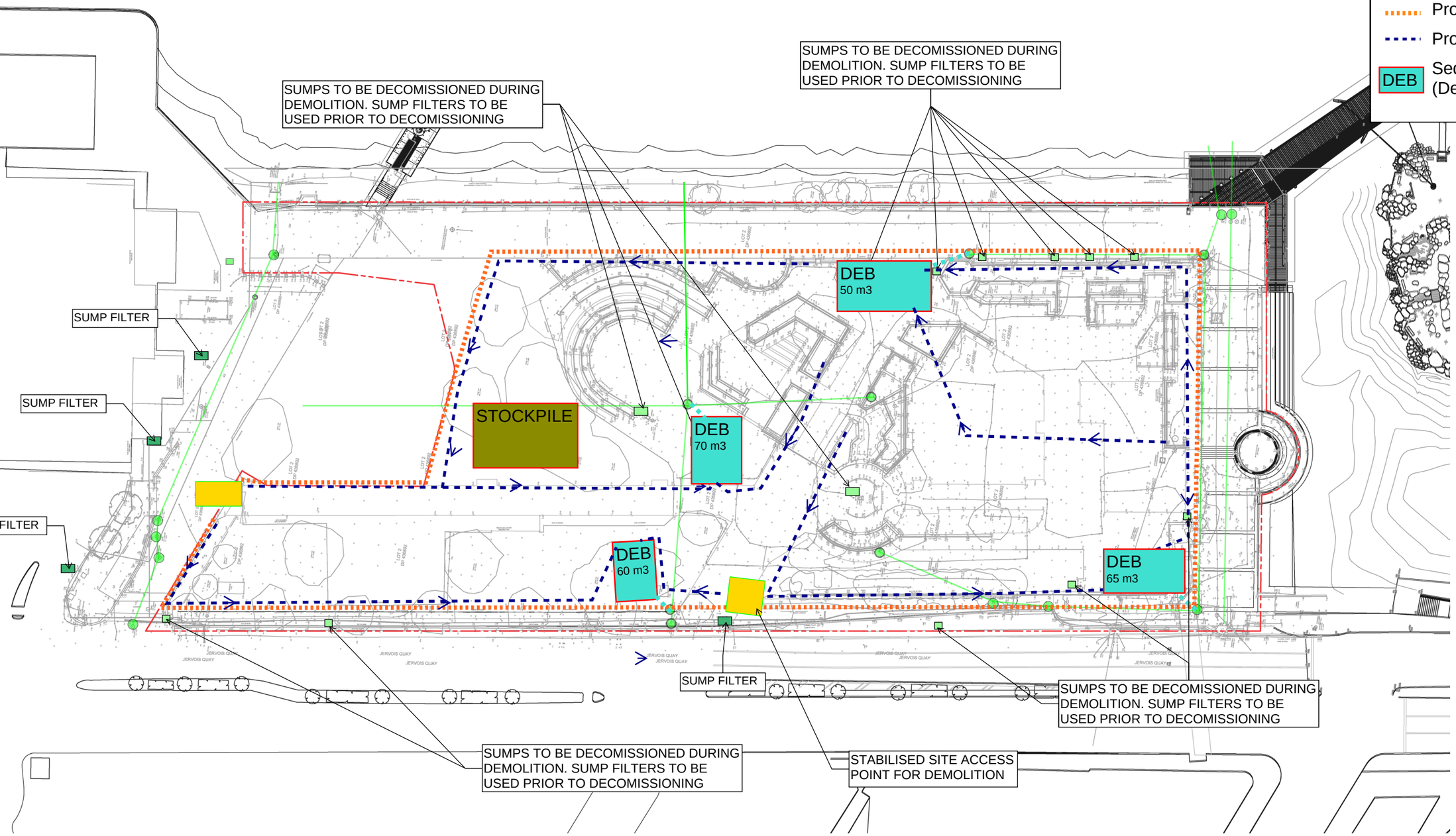
[3] Tonkin & Taylor Ltd (April 2024), Letter to Fale Malae Trust titled "Reliance Statement – Frank Kitts Park Redevelopment". T+T Ref. 1018875.4.

Appendix A ESCP layout plan

FRANK KITTS PARK RESOURCE CONSENT |

DRAFT EROSION SEDIMENT CONTROL PLAN



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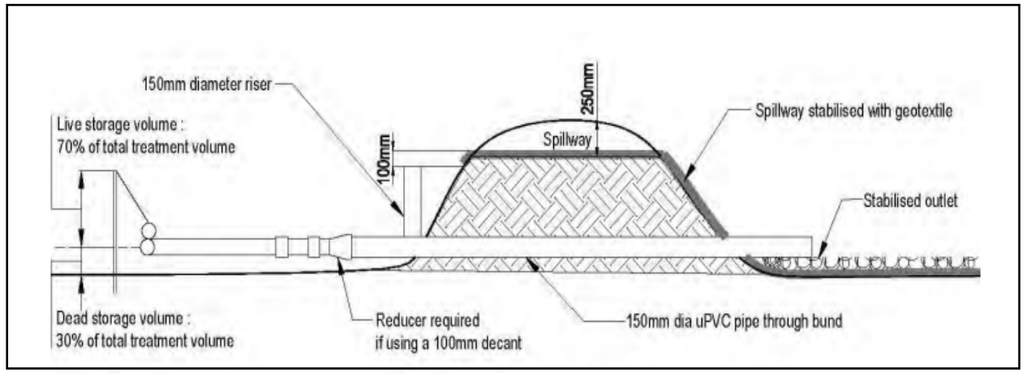
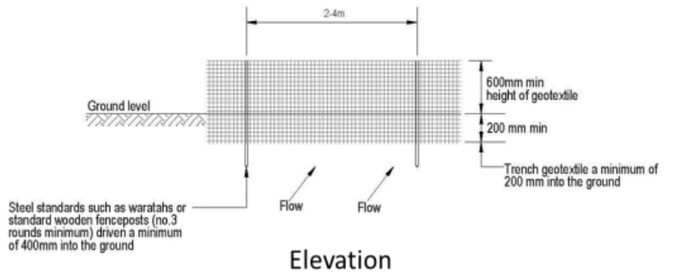
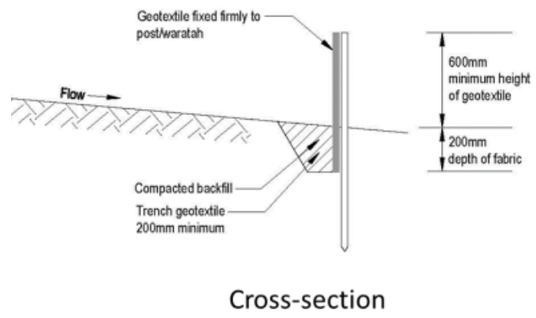
Appendix B ESCP typical details



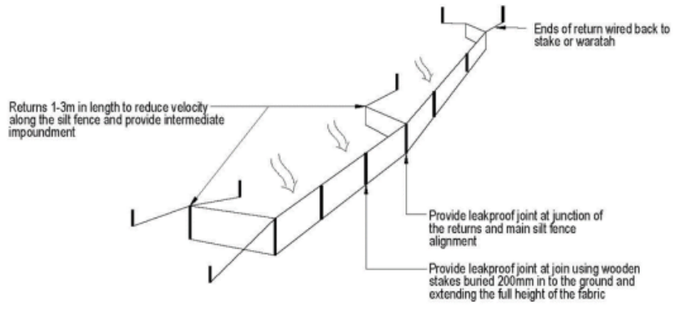
TYPICAL DETAIL A - DECANTING EARTH BUND CROSS SECTION



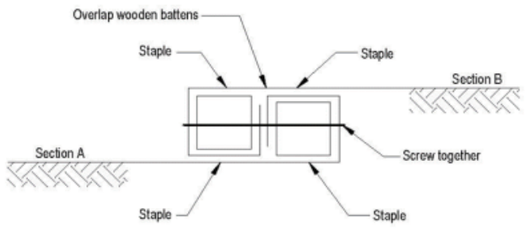
Elevation



Cross-section



Silt fence with returns and support wire

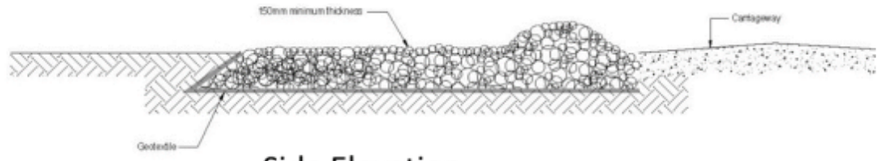


Standard fabric joint

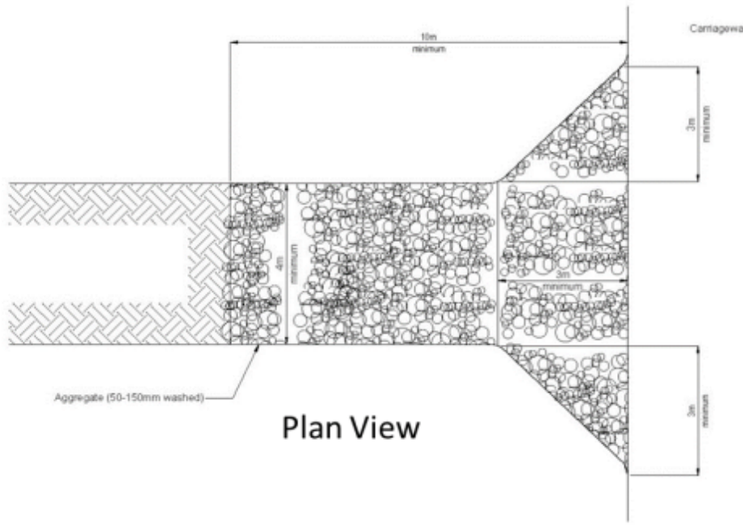
TYPICAL DETAIL B - SILT FENCE

Table 9: Stabilised entranceway specifications

Design parameter	Specification
Aggregate size	50 - 150 mm washed aggregate
Minimum thickness	150 mm
Minimum length	10 m
Minimum width	4 m



Side Elevation



Plan View

TYPICAL DETAIL C - STABILISED ENTRANCEWAY

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1. ALL DETAILS ARE TAKEN FROM GREATER WELLINGTON REGIONAL COUNCIL EROSION AND SEDIMENT CONTROL GUIDE FOR LAND DISTURBING ACTIVITIES.

NOTES

DESIGNED			DRAWING STATUS: DRAFT
DRAWN			
DESIGN CHECKED			
DRAWING CHECKED			

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED

APPROVED DATE

CLIENT: WELLINGTON CITY COUNCIL

PROJECT: FRANK KITTS PARK REDEVELOPMENT

TITLE: EROSION SEDIMENT CONTROL PLAN
CONTROL MEASURES TYPICAL DETAILS

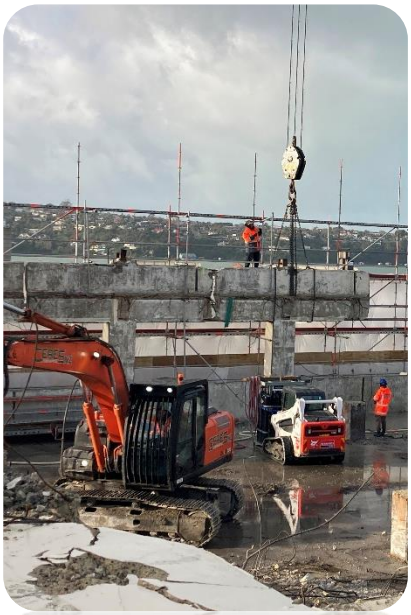
SCALE (A3): NTS DWG No. 1018875.4000 REV

Appendix C Demolition Management Plan

CERES NZ
ENVIRONMENTAL

"Proven"

"Responsive"



"Ready"

DEMOLITION MANAGEMENT PLAN

FRANK KITTS PARK DEMOLITION METHODOLOGY

Ceres New Zealand is committed to the protection of its employees, property and other people from accidental injury or damage from work carried out by and on behalf of the company, and adopt health, safety, and welfare as a fundamental business objective. whilst management have ultimate accountability, we all have a responsibility for health and safety in the workplace.

This Document will be reviewed by Ceres New Zealand's senior management and the client's representative to ensure relevance and set objectives for the project.

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Document Control

Rev No.	Date	Comment	Prepared By	Reviewed By
Draft 1	06/04/2022	Frank Kitts Park Management Plan-First Draft- Rev1	SL	CS
Draft 2	01/06/2022	Frank Kitts Park Management Plan-First Draft- Rev2	SL	CS

1 Purpose of the Demolition Management Plan

1.1 Purpose

The purpose of the Demolition Management Plan (DMP) is to provide measures to avoid or mitigate the effects of demolition activities on neighbouring sites, businesses, and the adjacent streets and to demonstrate compliance with the client specifications and the method in which these specifications will be achieved.

No.	Statement	Note
1.1	A secure site is provided from a health and safety perspective and maintain a safe transport network on adjoining roading corridors.	
1.2	The effects of demolition activities on adjoining buildings are managed.	
1.3	Demolition activities are managed so that dust nuisance shall not arise beyond the boundaries of the site.	
1.4		
1.5		
1.6		

2 The Project

2.1 Project Description

Frank Kitts Park site is located at Wellington Central Waterfront. The park extends from the TSB Arena to the lagoon, nestled between Jervois Quay and the waterfront edge. The park incorporates the Frank Kitts playground and the surrounding park area which is split across two different levels. The upper park area is situated on the roof of the underground car park at the southern end of the precinct. The overall site area is about 8500m2.

2.2 Scope of Work

The scope of work for this project is:

- Planning for demolition works including any approvals from Wellington city council and Worksafe (if required)
- Preparation of all the plans such as Site-Specific Safety Plan, Environmental Management Plan, Dust and Noise Management Plan, Asbestos Removal Control Plan and Waste Management Plan
- Liaise with structural engineers for approval of demolition methodology
- Removal of Salvage items from the car park and shops
- Prepare Traffic management plan and approvals from Wellington city council traffic team prior to starting demolition works. Liaise with Wellington city council traffic team to close any road or footpath during demolition
- Service disconnections to the car and bridge (mechanical, electrical, hydraulics, security, data, and communications)
- Demolition of Frank Kitts Park underground car park, amphitheatre. Levelling the site and associated structures.
- Removal the pedestrian bridge over Jervois Quay.
- Removal of material from the site. Reuse of any material to divert any items from the landfill

2.3 Site Security

- Site security hoarding/fencing will be installed along site working boundary as attached in site plan (picture 1)
- The hoarding/fencing will be maintained and checked for damages at regular intervals to ensure a secure site. All the gates will be secured, locked, and checked every day.
- All demolition works related signage will be put up on the fence to be visible to the public
- A hazard board will be put up at the site entrance and site office and will include all the hazards on site
- Asbestos and demolition related activity safety signage will be displayed on the hoarding for the public.
- Access to the site will be limited only to authorized personnel.
- All workers will be inducted as per the Site-Specific Safety Plan (SSSP).
- Permanent personnel will be allocated at gates to ensure the safe access of the crew.
- While trucks are exiting the site, spotters and traffic management will be allocated at gates to ensure safety of traffic and public.
- Extra care will be taken while the trucks exit the site as it is close to the traffic light. A TM personnel will be allocated on the exit gate to ensure all rules are followed

3 Enabling Work

Service contractors will be involved with disconnection of the services in the car park area and other demolition areas. The services will be disconnected at the boundary to ensure no services are present within the demolition area. As built drawings will be provided to the principal to ensure a record is maintained for future site works.

Where the services are live within the demolition area, the services will be protected and taken care of while demolition. Following are the proposed service provider for disconnection of services:

Type of service	Proposed Contractor
Electrical	Advanced building services
Mechanical	Advanced building services
Data	TBC
Water	Hockly Plumbing
Storm Water	Hockly Plumbing
Sewer	Hockly Plumbing
Fire	Wormald

4 Site Contaminant Management

4.1 Asbestos Management

An extensive demolition asbestos survey will be conducted by independent asbestos contractor to ensure the presence of any asbestos in the car park and other areas to be demolished. After the report has been received a detailed Asbestos Removal Control Plan will be prepared in accordance with asbestos present.

5 Hard Demolition Methodology

5.1 Site Setup & Preparation

The Frank Kitts Park site has been split into 3 sections. The sequence of demolition will start from Section 1 and then Section 2, the Section 3 overhead bridge will be removed at last. All the efforts will be made to minimise health and safety risks and interruptions to the public.

5.1.1 Site Plan

Picture 1 Site Plan

5.1.2 Site Setup

- Site security hoarding/fencing will be installed along site boundary.
- The hoarding/fencing will be maintained and checked for damages at regular intervals to ensure a secure site. All the gates will be secured, locked, and checked every day.
- All demolition works related signage will be put up on the fence to be visible to the public
- A hazard board will be put up at the site entrance and site office and will include all the hazards on site
- All erosion and sediment control measures will be undertaken to contain all the waste within the demolition site i.e., filter socks, drain covers, drain socks, and slurry trucks.
- All drains will be checked every week and the geo cloth will be replaced if required. The storm water inlets will be checked after every storm event and the geo cloth will be replaced.
- All remedial actions will be recorded in the weekly environmental audit, and it will be submitted to the principal representative as a part of the weekly progress report.

- All work will be carried out within the site fencing boundary.
- Ceres NZ will have a designated staging zone for all trucks and vehicles on site.
- Entry and exit will be via proposed route as mentioned in the site plan, this will enable the truck to come in and out of different gate and will avoid any disruption to the traffic
- One lane will be closed for a period of the car park demolition. Traffic management will be approved by Wellington city councils traffic team and all the plans will approved via relevant channels such as submitica.
- A full set of Demolition Management Plans will be prepared and submitted to Principals' representative and the local City Council for approval prior to demolition work commencing.

No.	Document Name	Submitted to (Approved by)		
		Principal	City Council	
1	Demolition Methodology Plan (DMP)	✓		
2	Site Specific Safety Plan (SSSP)	✓	✓	
3	Traffic Management Plan (TMP)	✓	✓	
4	Waste Management Plan (WMP)	✓	✓	
5	Environmental Management Plan (EMP)	✓	✓	
6	Noise and Vibration Management Plan (NVMP)	✓	✓	

5.2 Demolition of Section 1

Section 1 is a single level concrete building structure with carpark in the middle, shops in southern and western side and vegetation and public opening area on top.

Step 1 – Salvage Items Removal

A salvage list will be prepared by the principal, the items that on salvage list will be removed prior to demolition begins. All these salvage items will be carefully removed and hand over to the principal.

Step 2 – Vegetation Removal

To better segregate demolition waste on site, all the vegetation within Section 1 area will be removed first including trees, shrubs, grass, etc. Starting from northern side of Section 1, all of them will be removed and hauled out from the site. If required, all the native trees will be relocated to a suitable location, a location to be advised by the principal. A specialized tree recovery company will be engaged to perform the required works.

Step 3 – Strip Out

Strip out work will be carried out inside the building structure in the carpark, shops, this means all the redundant cables, timber fittings, doors, windows etc will be removed from the building structure. Hand tools and power tools will be utilized to carry out this work. A Bobcat will be utilized on site to load the strip out waste to the waste skip on site.

Strip out water that cannot be reused/ recycled will be disposed in the landfill.

Step 4 – Hard Demolition

Hard demolition will be carried out after service disconnections and strip out works are completed. To protect the public during the hard demolition stage, a vehicle lane on Jervois Quay close to site side will be closed for a period until the building structure close to Jervois Quay is demolished. This will enable demolition work to be carried out safely.

Separation work will be carried out before machine demolition work commence. The connection between the overhead pedestrian bridge and the building structure will be cut off by concrete cutting equipment, the bridge structure will be isolated so that the demolition of the carpark building structure will not have any impact on the bridge structure. As the structure will be cut off, the bridge will be fenced off from either side to ensure its not operational.

A 45-ton demolition excavator with shear attachment will be utilised to demolish the concrete building structure. Demolition will begin from the western side of the building and working towards eastern side. Level 1 concrete slab and concrete beams will be demolished, together with the concrete columns and walls. The ground floor slab will be removed at last after all the above ground building structure are removed.

Extra care will be taken while working close to the site boundary especially on southern and eastern side of the site, ensure all the debris stay within site boundary. All the demolition waste will be pulverized before being loaded out. The concrete waste will be recycled. Ceres will need to investigate the option of recycling concrete waste. This will be done once the start date is confirmed. The site will be levelled after all the building structure including foundation is removed from site. All the dust controls measure will be put in place before any demolition works begins. A dust management plan will be prepared and submitted to the principal for approval. A weekly environmental audit will carry out to ensure all controls are working. Backfill requirements is to be confirmed by the principal's geotechnical engineer.

Extra care will be taken while the trucks exit the site as it is close to the traffic light. A TM personnel will be allocated on the exit gate to ensure all rules are followed

Picture 2 Section 1 Demolition Plan

5.3 Demolition of Section 2

After Building structures in Section 1 is removed, demolition work will continue in Section 2.

Step 1 – Vegetation Removal

The first step of demolition of Section 2 is to remove the vegetation which includes removing all the trees, shrubs, grass, etc. that within site scope. Starting from southern side of Section 2, all of them will be removed and hauled out from the site.

Step 2 – Hard Demolition

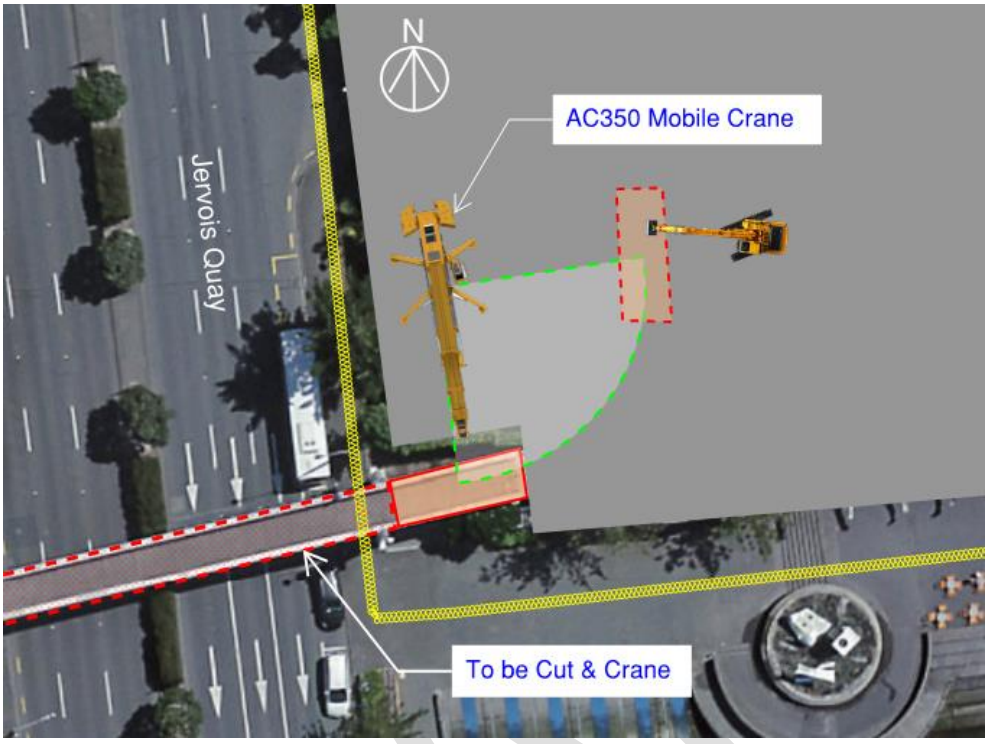
A 30-ton demolition excavator with concrete breaker attachment will be utilized to carry out the hard demolition. Demolition will begin from the southern side of Section 2 and working towards north. All the concrete structures within Section 2 including concrete walls, slabs, steps etc. will be broken and removed from site.

Extra care will be taken while working close to the site boundary especially on northern and eastern side of the site, ensure all the debris stay within site boundary. All the demolition waste will be pulverized before being loaded out. The concrete waste will be recycled. The site will be levelled after all the building structure including foundation is removed from site. Backfill requirements is to be confirmed by the principal's geotechnical engineer.

Picture 3 Section 2 Demolition Plan

5.4 Demolition of Section 3- Cut and Crane -Bridge

Section 3 is to remove the overhead concrete pedestrian bridge across Jervois Quay. This bridge will be cut & craned from Jervois Quay and will be transferred to Section 1 area to be processed. We proposed 2 options and there are some advantages and disadvantages in each method.



Picture 4 Section 3 Bridge Cut & Crane Step 1

Cut & Crane Preparation

The stairs which connected to the overhead bridge on both sides will be disconnected before the crane demolition begins. Gas cutting / concrete cutting equipment will be utilized to isolate the overhead bridge structure. To reduce the length of the cut & crane structure of the bridge, the eastern part of the bridge beyond the bridge sitting (about 9m long) will be removed by cut & crane method. The mobile crane will be set up inside the site and the bridge deck will be cut off and craned out. It will be placed on the site and be processed before it is loaded out.

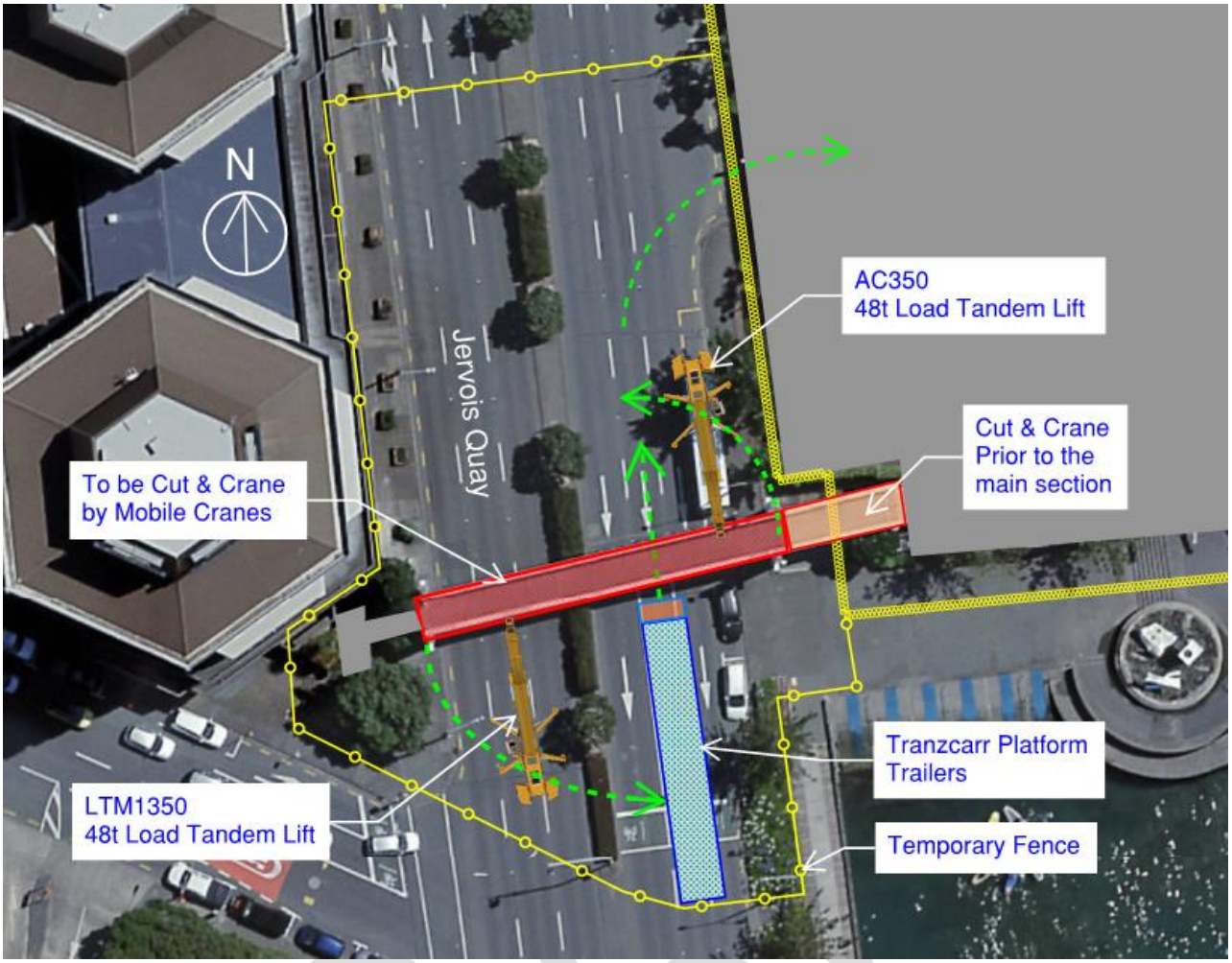
Option 1- Cut and Crane the bridge using 2 cranes

This method involves cutting and craning the bridge using 2 cranes and a large trailer. All the lanes on Jervois Quay will be closed off for a night. The pedestrians and traffic will be diverted to Willeston street for a night.

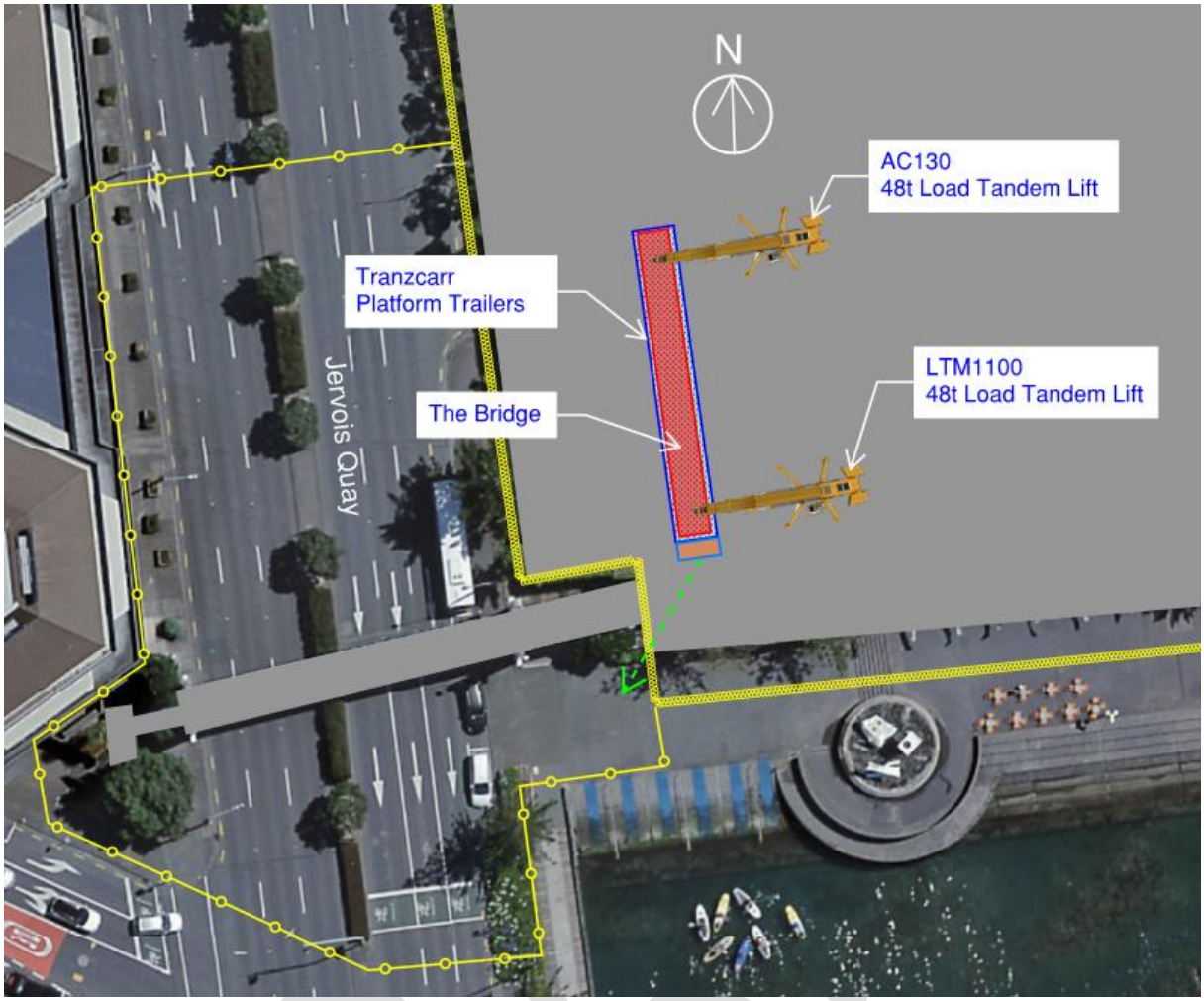
A LMT1350 mobile crane will be setup in one lane and AC350 mobile crane on another lane as attached in the plan below. The cranes will perform a tandem lift and place the bridge on to a large platform trailer. The crane will be then removed from the road and the trailer will be backed into section 1 which has already been demolished. The bridge will be unloaded by 2 x 48T cranes on to the ground for processing.

The bridge deck supporting structures on both sides of Jervois Quay will be removed subsequently after the bridge deck structure is removed, a 30-ton demolition excavator with concrete breaking attachment will be utilized to demolish the concrete columns and beams.

Concrete waste on western side of Jervois Quay will be transferred to the main site by a truck to process prior to be loaded out from site.



Picture 5 Section 3 Bridge Cut & Crane Option 1 – A



Picture 6 Section 3 Bridge Cut & Crane Option 1 – B

Advantages:

- Lighter and smaller cranes needed.
- Mobile cranes are easy to change locations

Disadvantages

- Live services in the location of setup, extra care to be taken will setup
- Weather dependent- Crane to be setup on the date based on historic wind data, if too windy the TMP must be setup next possible day and cranes must be rebooked
- Setup required on the night of the lift; crane setup will require 3-4 hours. The setup needs to start from 6pm and finish by 6am
- More cranes and equipment required on the day of the lift

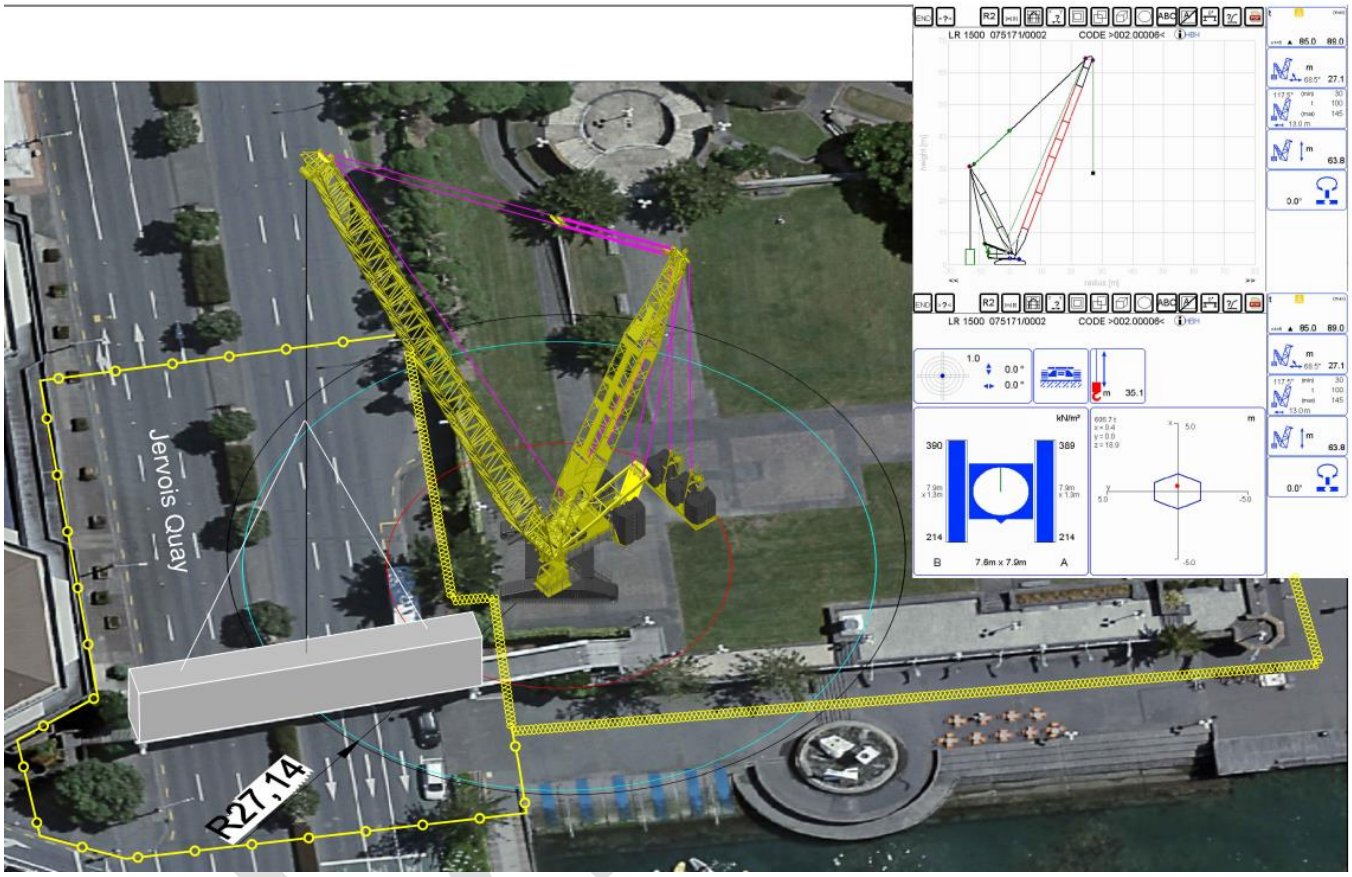
Option 2 – Cut and crane bridge using a crawler crane

This method involves cutting and craning the bridge using 1x 500T crawler crane only. All the lanes on Jervois Quay will be closed for a few hours during the cut & crane work is being carried out. The pedestrians and traffic will be diverted to Willeston street for a night.

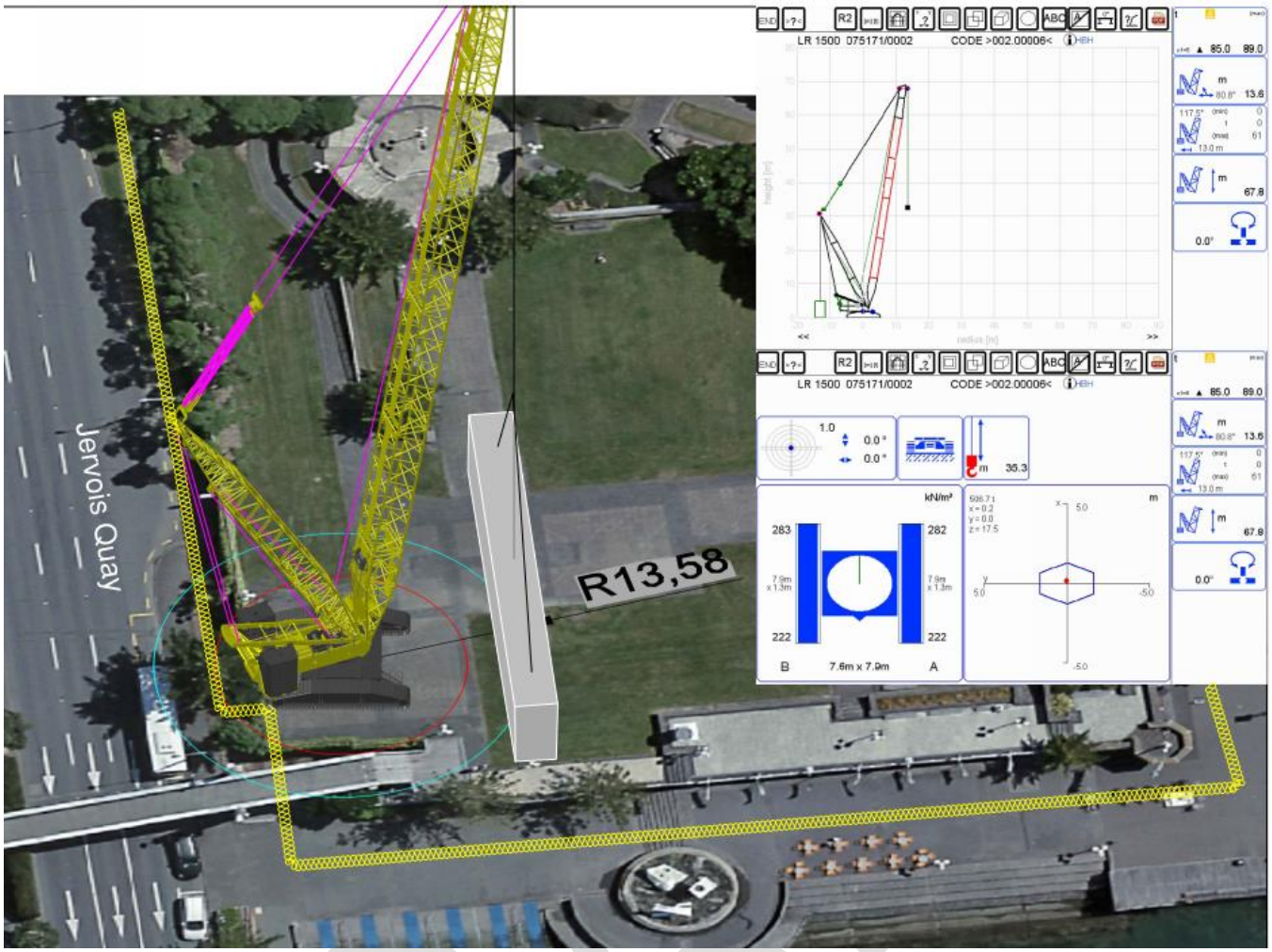
A LR1500 crawler crane will be set up in the southwest corner of Section 1 area as shown in the plan below. The crane will lift the bridge deck and place it on the ground in Section 1 area for processing.

The bridge deck supporting structures on both sides of Jervois Quay will be removed subsequently after the bridge deck structure is removed, a 30-ton demolition excavator with concrete breaking attachment will be utilized to demolish the concrete columns and beams.

Concrete waste on western side of Jervois Quay will be transferred to the main site by a truck to process prior to be loaded out from site.



Picture 7 Section 3 Bridge Cut & Crane Option 2 – A



Picture 8 Section 3 Bridge Cut & Crane Option 2 – B

Advantages

- One lift only, no transfer needed.
- Shorter road closure time.
- Setup can be done in the car park area anytime
- In case the lift cannot be completed due to weather, crane will be already setup to reschedule the lift
- Crane will be setup in the car park area, services will be disconnected

Disadvantages

- Suitable engineered crane pad to distribute the weight of crawler crane

5.5 Demolition Plant & Equipment List

Equipment Name	Ownership
Caterpillar CAT345 Demolition Excavator	Ceres NZ
Hitachi ZX330 Demolition Excavator	Ceres NZ
Hitachi ZX200 Demolition Excavator	Ceres NZ
Bobcat Track Loader T190	Ceres NZ
20t Tipulators	Ceres NZ
Bin truck	Ceres NZ
LTM1350 – Mobile crane	Subcontractor
LR1500- Crawler crane	Subcontractor
2x 100T Mobile crane	Subcontractor

5.6 Demolition Risks

Table 1 Risk Management

No.	Description/risk	Effect/Measures
1	Unauthorised Entry	▪ All fencing/hoarding will be checked at regular intervals. ▪ Gates will be locked to avoid any unauthorised entry. ▪ Spotters will be allocated at the gates during working hours and a security camera after hours.
2	Noise and Vibration	▪ All equipment will be serviced at regular intervals. ▪ Truck engines will not be left idling when not in use. ▪ No demolition work will be carrying out after hours.
3	Dust	▪ Water hose to spray demolition work area. ▪ Slow truck movements, water wheel cleaning at exit gates.
4	Spills	▪ Heavy machinery inspection during daily pre-start for any hydraulic leaks or defects. ▪ Easily accessible spill kits. ▪ All hazardous materials will be stored in designated areas with bunds.
5	Sediment	▪ Ensure Slurry stays on-site, slurry removed with sucker trucks or wet vacuums. ▪ Barrier/filter socks at site boundary to stop run-off. ▪ Regular environmental audits. ▪ Regular drainage inspections;
6	Traffic	▪ Robust traffic management plan. ▪ Spotters for heavy vehicle traffic. ▪ Proper signage displayed on the fence;
7	Road	▪ The road will be cleaned at regular intervals with a sweeper attachment on a bob cat or by a sweeper truck. ▪ The tyres of the trucks will be cleaned before exiting the site. ▪ A wheel wash will be installed at the exit gate to keep wheels clean of the trucks;
8	Weather	▪ No demolition work will be carried out during extreme weather. ▪ Weather forecast will be checked on a regular basis and demolition activities rescheduled.

6 Communication Plan

6.1 Weekly Progress Report

Ceres NZ will prepare detailed weekly update in terms of demolition activity on site.
The weekly report will include:

- The completed work on site in previous week.
- The plan of demolition work in the coming week.
- The fencing movement during the demolition work.
- The traffic management changes to the area (road closures, car park space closures, bus route changes etc.).
- Demolition working hours and truck movement hours.
- Demolition dust, noise and vibration effect and control.

6.2 Weekly Progress Meeting

Ceres NZ will be attending the weekly meeting with the client and other stakeholders, the object of the meeting is to resolve any issues that influence the demolition work, to make sure the demolition work will be carried out safely and efficiently. Generally, the following issues will be discussed:

- Demolition progress and the updated programme.
- Completion demolition work in previous week and the issues resolved.
- Upcoming demolition work in next week and the potential issues.
- Issues/Problems that needs other stakeholders to concern/resolve.
- Issues/concerns raised by client/other stakeholders.

6.3 Understanding and Closing Out Concerns

A process involving Ceres NZ's Site Manager will be implemented as follows:

- All complaints will be directed in the first instance to the Ceres NZ designated Site representative.
- This person will be the Ceres NZ Site Manager.
- This person will have responsibility to ensure that the complaints procedure is enacted.
- The site will have prominently displayed the works signboard with the 24-hour contact number of the demolition contractor on site manager.
- The contractor will maintain an onsite complaint register and log of actions taken.
- The register will include:
  a) A standard complaint Pro forma
  b) Date of complaint
  c) Complainant name
  d) Actions taken
  e) Report back to complainant
  f) Close out
- The management of complaints during the delivery phase will receive high level attention from the Ceres NZ Project/Site management and RCP management team as required for resolution.
- Ensuring that concerns are noted, acted upon, and closed out.

Table 2 Communication Record

Description	Information	Notes/Comments
Date of Complaint		
Complainants Name		
Details of Complaint		
Site Manager Investigation		
Actions Taken/Implemented		
Reported Back to Complainant		
Close Out Date		

7 On-Site Amendment Sheet

Minor amendments will be carried out by the Site Supervisor. Any major amendments to this document will require discussion and authorisation from senior management. All changes are to be recorded in the table below.

Date	Time	Details of On-Site Changes	Name of Competent Person Carrying Out Changes

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Christchurch 8011
www.ceresnz.co.nz

www.tonkintaylor.co.nz