Enviser Ref: 1339

August 2025

Draft Construction Environmental Management Plan

Akaroa Wharf, New Zealand

Christchurch City Council

Contents

1 Introduction

Christchurch City Council (CCC) is seeking resource consents for the construction of the replacement Akaroa Wharf. This draft construction environmental management plan (CEMP) has been prepared to support the consent application process and will be updated once consents are granted to incorporate specific consent conditions and contractor methodology and equipment.

This CEMP has been collated by Enviser Limited using the assessments provided by the following consultants:

- Marine mammals and ecology (Cawthron)
- Coastal processes (Jacobs)
- Marine avifauna (BlueGreen Ecology)
- Archaeology (South Island Archaeology)
- Heritage (Team Architects)
- Stormwater management (Storm Environmental)
- Traffic (Stantec)
- Terrestrial noise and vibrations (Marshall Day)
- Underwater noise (Styles Group)
- Recreation and tourism (Rob Greenaway & Associates)
- Landscape Architects (Rough Milne Mitchell and Isthmus)
- Lighting (Pederson Read)

1.1 Purpose

This purpose of this CEMP is to identify environmental risks associated with the construction of the replacement Akaroa Wharf, to document the practices required to minimise environmental effects, and to ensure compliance with performance standards and consent requirements.

This document provides an overarching environmental management framework and attaches the following specific management plans:

- Spill Management Plan: Appendix A
- Erosion and Sediment Control Plan (ESCP): Appendix B
- Reclamation Rehabilitation Plan (RRP): Appendix C
- Marine Mammal Management Plan (MMMP): Appendix D
- Biosecurity Management Plan (BMP): Appendix E
- Construction Noise and Vibration Management Plan (CNVP): Appendix F
- Archaeological Management Plan (AMP) & Archaeological Authority: Appendix G
- Historic Heritage Plan (HHP): Appendix H
- Temporary Protection Plan (TPP): Appendix I
- Contaminated Site Management Plan (CSMP): Appendix J
- Temporary Traffic Management Plan (TTMP): Appendix K
- Construction Traffic Management Plan (CTMP): Appendix L
- Tier 1 Marine Oil Response Plan (Appendix M)
- Dredge Management Plan (Appendix N)

1.2 Statutory requirements

Upon consents being granted, Table 1-1 will identify the relevant consent conditions and where these are addressed in the CEMP.

Table 1-1: Relevant consent conditions to CEMP

Consent or Authority	Details	Section in CEMP

1.3 Updating the CEMP

This CEMP is a live and controlled document that will be continuously reviewed and updated throughout the duration of the project. Any changes must be made in accordance with the relevant conditions outlined in resource consent CRCXXXXXX.

This CEMP must be amended if:

- the scope of works or methodology changes
- the mitigation measures are not working sufficiently
- responsible parties change
- the environmental conditions change
- the season or time of day in which the works need to take place changes
- the area of works increases or changes
- you have identified improvements to the process or mitigation measures
- the duration of your works significantly changes
- any other changes occur that alter the effectiveness of the CEMP to manage the negative environmental effects of the works.

Table 1-2 below presents a document control register to track the changes made to the document.

Table 1-2: Document control register

Date	Page/s Amended	Nature of Change	Approved By

1.4 Roles and responsibilities

It is the responsibility of Christchurch City Council (CCC) to ensure that the staff responsible for implementing this CEMP understand and can implement its requirement. CCC is also responsible ensuring any contractors working on the site understand and are able to implement the requirements of the CEMP during their on-site work. **Table 1-3** details the personnel responsible implementing this CEMP.

Table 1-3: Roles and responsibilities register

Role	Person	Contact
CCC Project Manager	Jane Benton (CCC)	027 275 7498
Engineer to Contract	Jonathan Deaker (Projectum)	021 630 012
Environmental Manager	Jared Pettersson (Enviser)	021 679 838
Contractor's Project Manager	Gerome Mangalus (HEB)	027 531 0038
Foreman	TBA	
Subcontractor	TBA	
Supervising Heritage Adviser	William Fulton (Team Architects)	027 2692 759
Supervising Archaeological Adviser	TJ O'Connell (South Island Archaeology)	020 4178 3081
CCC Contact Person	Jane Benton (CCC)	027 275 7498
Technical Experts		
Erosion and sediment control	Technical advice as needed	Jared Pettersson (Enviser)
Wildlife (incl. avifauna)	Technical advice as needed	Leigh Bull (BlueGreen Ecology)
Marine mammals	Technical advice as needed	Deanna Clement (Cawthron)
Marine ecology & biosecurity	Technical advice as needed	Ross Sneddon (Cawthron)
Terrestrial noise	Technical advice as needed	Jon Farren (Marshall Day)
Underwater noise	Technical advice as needed	Matt Pine (Styles Group)
Archaeology	Technical advice as needed	TJ O'Connell (South Island Archaeology)
Heritage	Technical advice as needed	William Fulton (Team Architects)

1.5 Training

All staff carrying out construction, or those with site management responsibilities, will undertake a formal site induction that will identify the environmental risks and management processes described in this CEMP. Anyone who is unfamiliar with any of the control or mitigation measures, equipment, and/or incident response procedures will receive appropriate training.

Training may include (but is not limited to) such matters as spill response and equipment, erosion and sediment control, and cultural awareness. No one will be permitted to work on the site until they have completed the site induction process.

2 Site description

Akaroa Wharf is located on the foreshore within French Bay on the eastern side of Akaroa Harbour (Figure 1). The existing timber wharf is connected by an historic concrete abutment that interfaces with Britomart Reserve, to the south, and the historic former Wharfinger's Office and Fisherman's Rest shelter and their immediate surrounds to the north. The landward section of the abutment will be retained, including the section of the concrete parapet wall that runs parallel to the shoreline on the southern side of the Wharf. This area includes a number of listed Heritage items that are historically associated with the wharf.

There are two privately-owned buildings accessed via the existing wharf which will remain in-situ, and the new wharf built alongside with accessible connections to the re-established wharf.

The area surrounding Akaroa Wharf, and the proposed laydown areas adjacent to the wharf and at the Akaroa Recreation Grounds are all frequently used by members of the public, including visitors to Akaroa. Akaroa village is particularly busy during the summer months and weekends, and a large public presence is expected during site works.

Akaroa's narrow streets limit vehicle manoeuvrability and the site's location in Akaroa's commercial centre present accessibility constraints for vehicles delivering materials. Limited unused flat land adjacent to the site means that two smaller laydown areas will be utilised, and wharf construction works undertaken from both land and marine sides. A temporary berth pocket/landing ramp will be established on the southern side of the Akaroa Boat Ramp (at the Akaroa Recreation Ground), and it will remain for the duration of works. It will provide berthing space for a barge to transport materials between Laydown Area 1 at the Akaroa Recreation Ground (

Figure 2) and Laydown Area 2 adjacent to Akaroa Wharf (Figure 4).

Landward of the wharf, there are a mix of commercial and residential properties in the immediate vicinity of the site with a number of retail and hospitality businesses located on the opposite site of Beach Road.

On either side of Akaroa Wharf, intertidal beaches of gravel, pebbles, cobbles and boulders (and ephemeral layers of sand).[1] The shoreline immediately to the north side of the wharf is comprised of vertical seawalls with a shelf of rocks located at the toe that are exposed at low tide. To the south, the seawall fronting Britomart reserve is fronted by a narrow all-tide pebble and cobble beach, with an intertidal sand zone that transitions into sandy mud.

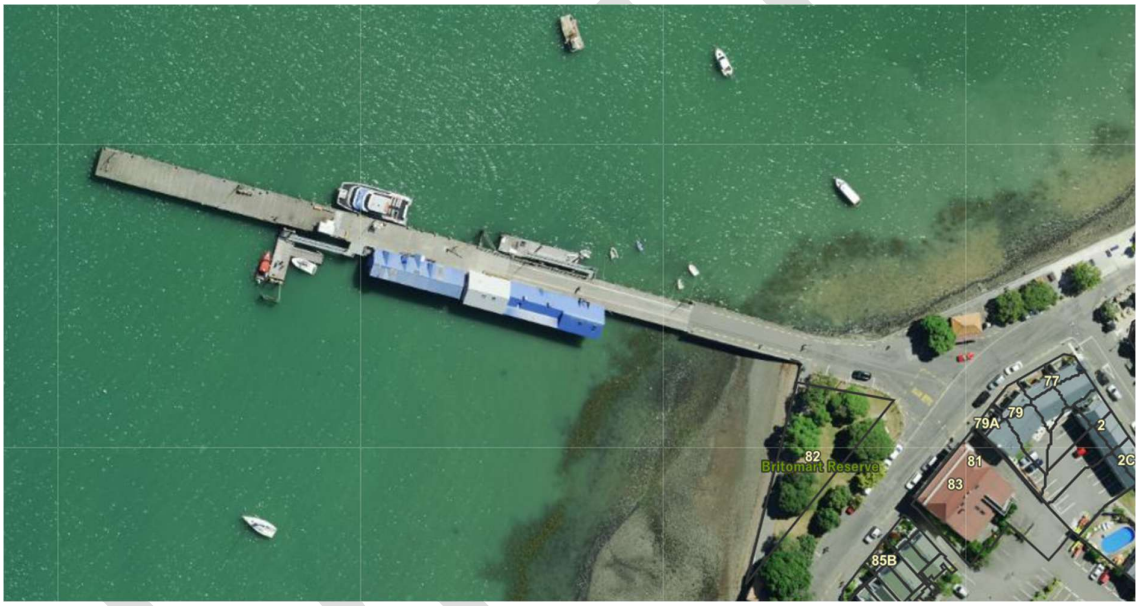

Figure 1: Akaroa Wharf within French Bay, Akaroa Harbour (Source: Canterbury Maps.)

[1] Sneddon R, Morrisey D. 2024. *Replacement of Akaroa Wharf: assessment of effects on benthic ecology. Nelson: Cawthron Institute. Cawthron Report 3921. Prepared for Christchurch City Council.*

2.1 Construction laydown areas

Two laydown areas will be established on the landside areas described below and shown in

Figure 2 and Figure 4. The perimeter of each laydown area will be demarcated by a 1.8 m security fence. Traffic management measures will be in place at both locations to direct traffic movements and maintain traffic flow.

Laydown Area 1 is located on unsealed ground at the Akaroa Recreation Ground and is the main load out facility for the project. An area of the carpark/road alongside the Akaroa Boat Ramp and across from the recreation grounds will also be closed off to the public, to allow for a temporary berth to be formed through reclamation and dredging alongside the Akaroa Boat Ramp (see Figure 3). The public boat ramp will remain accessible for the public for the duration of the project.

The temporary berth will allow the Patiki barge to berth while loading plant and materials to be transported to the main Akaroa Wharf construction site. Working plant, materials and storage containers will be present at Laydown Area 1.

Laydown Area 2 is located at the base of the Akaroa Wharf. This laydown area is the main base of operations and incorporates the former Wharfinger's office. and notable trees immediately north of the wharf abutment. A vehicle staging area, located 80 m further south down beach road (Bruce Slipway) will be closed off to the public to act as a holding point for concrete trucks during concrete pours. Laydown Area 2 excludes Britomart Reserve and Road Reserve which will remain publicly accessible for the duration of the project.

Figure 2: Laydown Area 1 at the Akaroa Recreation Ground.

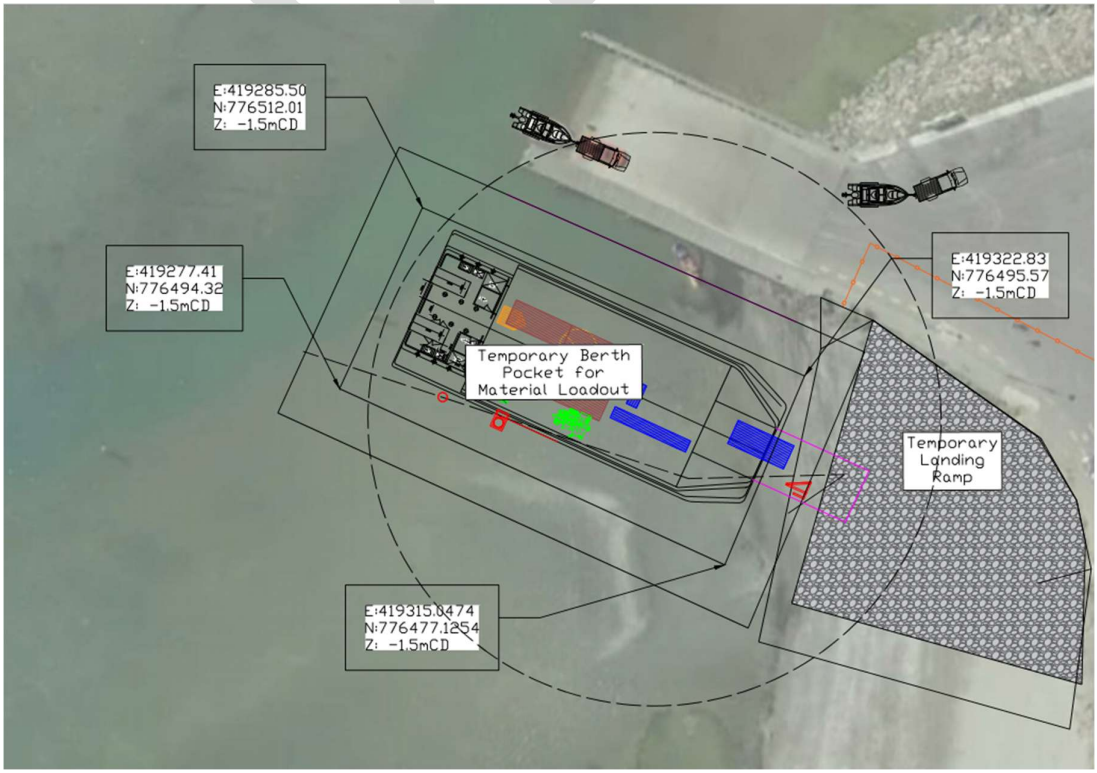

Figure 3: Temporary berth alongside the Akaroa Boat Ramp (HEB, 2025).

Figure 4: Laydown Area 2 at Akaroa Wharf and vehicle staging area at Bruce Slipway.

3 Project description

The Akaroa Wharf has reached the end of its useful life and needs to be replaced. CCC is building a new wharf (185 m long and 8 m wide) with two floating pontoon structures that link to the wharf. A summary of the key project phases is set out below.

3.1 Site set up and establishment

Establish contractor laydown facilities and storage areas at Laydown Area 1 (at the Akaroa Recreation Ground) and Laydown Area 2 (at the base of the Akaroa Wharf):

Laydown Area 1

- Install 1.8 m security fence at perimeter.
- Install security camera.
- Set up the traffic controls set out in Construction Traffic Management Plan (including gate/transport controller during operating hours).
- Set up erosion and sediment control measures set out in the Erosion and Sediment Control Plan.
- Undertake dredging and temporary reclamation to establish a berth to allow the Patiki to berth alongside to transfer plant and materials.
- Set up on-water navigation controls.

Laydown Area 2

- Install 1.8 m security fence at perimeter.
- Install security camera.
- Install protective measures and monitoring procedures for neighbouring heritage items - Beach Street Bridge, former Wharfinger's office, and notable trees.
- Set up temporary the traffic controls set out in Construction Traffic Management Plan.
- Set up erosion and sediment control measures set out in the Erosion and Sediment Control Plan.
- Set up on-water navigation safety controls.

3.2 Wharf demolition

- Install a floating boom prior to marine-based demolition works commencing.
- Salvage usable timber for re-use in new design, other marine structures or landscaping.
- Salvage iron fittings connected to the wharf (including steel ladders, cleats, bolts, metal caps and one cast iron service cover).
- Relocate crane from Akaroa Wharf to Daly's Wharf.
- R emove the two existing floating pontoons and associated structures.
- Demolish and remove the timber wharf, which will require landside storage of demolition materials. The demolition will involve the use of land and water-based equipment. The public will be excluded from water and landside construction areas. Existing piles will be removed or cut back to seabed level.
- Excavate and remove the abutment back to the line of the adjacent seawalls.
- Undertake limited piling and structural timber work to ensure the existing buildings are adequately supported during the construction phase.

3.3 Wharf construction

- Construct the 'L-wall' to provide support and staging space for the piling.
- Installation of 44-55 steel-cased concrete piles (710 mm diameter) for the main wharf, which will be socketed into the underlying basalt. Vibro or bored piling methods (using a 100-ton crawler crane with an ICE 28RF vibro hammer) to be used to drive the piles as far as possible.
- A percussion piling hammer will drive the piles until the desired embedment into the basalt is achieved. If the required embedment cannot be achieved with percussive piling, the pile may need to be removed, and a drill used to pre-drill a socket into the basalt before the pile is re-driven.
- Piles to be filled with concrete and the capping beams put in place.
- Temporary platforms/grillage installed on the capping beam to allow the piling rig to advance to the next bent. Temporary piles, the same diameter (or smaller) as the permanent piles may be installed to support the temporary works.
- Install 18 timber piles and supplementary timber beams adjacent to the wharf.
- A second, marine-based piling crew, will undertake a similar operation with a piling rig based on the barge. The marine-based rig will work from the outer end, install piles and then demolish the existing wharf. Once it has met up with the land-based rig, it will assist the land-based operation with the capping beams and placement of concrete in the piles. The marine-based plant will also be used to remove all the old timber piles that clash with the new, with the remainder cut at seabed level using hydraulic shears or by divers.
- Install formwork and pour the topping slab (concrete deck).
- Install fender piles (26, but these will be driven into the seabed but not socketed into the basalt).
- Install deck furniture, connections to the existing buildings and services.
- Install floating pontoons (north and south) including the piled platforms, gangways, fender piles (4) and associated services (water, power and fuel on the southern pontoon only). Approximately 12-16 steel piles (710 mm diameter) are expected to be required.
- Undertake any surface treatment on the landside (i.e. asphalt, whāriki, decking, install street furniture etc).

3.4 Demobilisation

- Remove equipment and site controls (all areas).
- Remove laydown areas and undertake any necessary make good repairs.
- Reinstate the temporary reclamation at the Akaroa Boat Ramp to its natural state in accordance with the Reclamation Rehabilitation Plan.

3.5 Project constraints and assumptions

The following notes provide additional information on the construction methodology and assumptions that informed this CEMP. These will be reviewed and updated once consents are granted.

- The existing buildings alongside Akaroa Wharf will remain in-situ and will be retained on their existing pilings (and structurally independent) with accessible connections to the re-established wharf.
- Dredging is required only alongside the Akaroa Boat Ramp to form a temporary berth, and not for vessel navigation purposes at Akaroa Wharf.

- All surplus material/soil etc from the abutment removal will be disposed of at an authorised land-based facility.
- Large construction materials (i.e. piles) transported to the wharf site via barge from the temporary berth alongside the Akaroa Boat Ramp. A crane pad and crane will be required at Laydown 1 for loading construction materials and unloading demolition materials.
- Placement of materials on the seabed will be confined to within the design footprints (including L-wall and riprap) for the wharf and floating pontoons.
- Dredge spoil at the Akaroa boat ramp temporary berth will be placed on the sea floor, to the southwest of the dredge pocket.
- Demolition and construction works will largely be completed by marine-based plant or be staged from the constructed sections of the wharf.
- Piles will be driven using a combination of percussive, bored and vibratory methods. The socket in the basalt will likely be drilled.
- Demolition material will be taken to the laydown areas prior to disposal.
- There will be limited contractors' temporary buildings located in the area immediately adjoining the existing wharf abutment off Beach Road. (This area is tightly constrained by heritage structures, public transport movements, and the parking and access needs for adjoining commercial businesses). It is anticipated that one small portacom for use as a messing facility will be placed in this area.

3.6 Timeframes

Demolition and construction works are anticipated to take place over an 11-to-14-month period.

[Indicative timeframes for each project phase to be added following appointment of a main contractor.]

3.7 Scope of this document

This CEMP addresses environmental effects associated with the construction works described above and must be read in conjunction with the attached additional management plans:

4 Summary table – project phase risk areas

Project Phase	Area of Risk	Section Reference
Site Establishment	Dust	8 and 22
	Recreation & Tourism	19
	Dredging	23
Demolition	Hazardous substances	7
	Erosion and sediment generation and stormwater	8
	Dust	8 and 22
	Coastal habitat and processes	9
	Marine avifauna	10
	Marine mammals	11
	Marine biosecurity	12
	Noise and vibration	13
	Archaeology	14
	Heritage	15
	Contaminated land	16
	Debris and waste minimisation	17
	Traffic management	18
	Recreation & Tourism	19
	Landscape, visual and natural character	20
	Lighting	21
Construction	Flowable materials	6
	Hazardous substances	7
	Erosion and sediment generation and stormwater	8 and 22
	Coastal habitat and processes	9
	Marine avifauna	10
	Marine mammals	11
	Noise and vibration	13
	Debris and waste minimisation	17
	Traffic management	18
	Recreation & Tourism	19
	Landscape, visual and natural character	20
	Lighting	21
	Dust	22

5 Environmental risk assessment

Before any risks can be managed or controlled it is necessary to know the nature, likelihood, and impact of those risks. Risk management involves the identification, assessment, control, monitoring, and reporting of risks for the project.

Table 5-1 below identifies the key risks and associated risk ratings for each.

The risk rating for each environmental effect was generated using the risk assessment tool described in **Appendix O**. Each environmental effect was assessed based on the likelihood of occurrence and the potential impact.

In each section, the highest risk identified was selected as the overarching risk classification for that activity.

Table 5-1: Project specific environmental risks

Environmental effect	Risk Rating
Flowable materials	LOW-MEDIUM
Hazardous substances	LOW-MEDIUM
Erosion and sediment generation	LOW
Coastal habitat and processes	LOW
Marine avifauna	LOW
Marine mammals (incl. underwater noise)	LOW-MEDIUM
Marine biosecurity	LOW-MEDIUM
Noise and vibration	HIGH
Archaeology	LOW-HIGH
Heritage	LOW
Contaminated land	MEDIUM
Debris & waste minimisation	LOW
Traffic/site management	LOW
Recreation and tourism	LOW
Landscape, visual and natural character	LOW-MEDIUM
Lighting	LOW
Dust	LOW
Dredging	LOW

The specific environmental risks are discussed in more detail in the following sections.

6 Flowable materials

Flowable materials	LOW-MEDIUM

6.1 Environmental risk assessment

Flowable materials includes any cohesive 'slurry' that can be used to fill (or backfill) voids. For this project, this is likely to include grout, concrete and polymers used to fill the piles and create the key into the basalt layer.

If flowable materials are not contained, they can inadvertently leak into the environment causing significant damage, costly delays and reputational harm for those involved. All works are within the coastal environment which is considered a sensitive receptor.

Flowable materials can vary in their nature, but grout/concrete is strongly alkaline and can cause adverse environmental effects if discharged in large quantities. In small quantities, the risk is low as seawater is an effective buffer and can neutralise the alkalinity with adequate mixing. However, a large discharge (or a smaller discharge into shallow water) could result in adverse effects and control measures are needed. Wash water or curing water from concrete/grout is also highly alkaline and requires the same management measures as the flowable material.

At Akaroa Wharf, flowable materials will be used:

- to install the pre-cast concrete 'L-wall' seawall at the new abutment
- to install the concrete-filled steel piles for the main wharf and pontoons
- for in situ concrete pours to form the main wharf deck surface and approach path.

The proposed methodology for pile-filling and the in situ pouring of the wharf deck and approach path mean that concrete will largely be contained within the steel piles and by the upturns on the pre-cast deck elements or by formwork.

The overall environmental risk posed by flowable materials associated with the replacement Akaroa Wharf is deemed to be low-medium.

6.2 Performance standards

No cement, grout or polymer-based products (or associated wash water) shall be purposefully discharged directly to the coastal marine area (CMA). Accidental discharges to be managed with spill response procedures.

6.3 Control measures

Table 6-1: Control measures for flowable materials.

Type of work	Risk	Controls
Installation of L-wall/new abutment using grout, concrete and/or polymers.	LOW-MEDIUM	Monitor weather forecasts prior to undertaking concreting and/or grout works and plan to undertake all concrete or grout works during calm weather to reduce risks of spillage or damage to the containment structures. Put protections in place before weather events occur to prevent damage to the formwork.

Type of work	Risk	Controls
		As far as practicable, undertake works during low tide. Ensure all formwork is well sealed to prevent leakage of concrete/grout and curing water. Inspect all machinery (i.e. pumps) prior to use to make sure all joins are sealed and working correctly. Lay catch trays/protective sheeting under the concrete delivery pipework/pump. Calculate volume of flowable substances required prior to filling and use only the calculated volume to enable early detection of material loss/spillage. Any wash water used or generated during concreting works should be captured and contained in settlement tanks for treatment rather than discharged into the marine environment. Collect and appropriately dispose of any waste wet concrete. Have appropriate spill kit/booms on site in case of spillage.
Installing concrete-filled steel piles for the main wharf and pontoons, and temporary berth.	LOW-MEDIUM	Monitor weather forecasts prior to undertaking concreting and/or grout works and plan to undertake all concrete or grout works during calm weather to reduce risks of spillage or damage to the containment structures. Use methods that achieve a good seal at the base of the pile to prevent grout/polymer loss. Use a custom chute to improve efficiency when filling steel piles. Chute to have high sides to limit spillage or overspray. Inspect all machinery (i.e. pumps) prior to use to make sure all joins are sealed and working correctly. Lay catch trays/protective sheeting under the concrete delivery pipework/pump. Calculate volume of flowable substances required prior to filling and use only the calculated volume to enable early detection of material loss/spillage. Have appropriate spill kit/booms on site in case of spillage. Collect and dispose of waste wet concrete and used polymer appropriately.

Type of work	Risk	Controls
In situ concrete pours to form the main wharf deck surface and approach path	LOW-MEDIUM	Monitor weather forecasts prior to undertaking concreting and/or grout works and plan to undertake all concrete or grout works during calm weather to reduce risks of spillage or damage to the containment structures. Precast outer panels of main wharf deck to include upturns to contain concrete and eliminate need for form work. Inspect all machinery (i.e. pumps) prior to use to make sure all joins are sealed and working correctly. Lay catch trays/protective sheeting under the concrete delivery pipework/pump. Calculate volume of flowable substances required prior to filling and use only the calculated volume to enable early detection of material loss/spillage. Have appropriate spill kit/booms on site in case of spillage. Collect and dispose of waste wet concrete appropriately.

6.4 Monitoring

The site construction team must continuously observe the works during the placement of flowable materials. Special attention should be paid to the identification of leaks and the level of flowable materials to avoid over filling and loss to the environment. If a leak or spill is detected, the filling operation shall cease immediately, spill response procedures instituted (as per the Spill Response Plan – **Appendix A),** and the methodology amended to prevent further spills before restarting the work.

6.5 Reporting

Reporting will be completed as per the Project Management Plan (provided by the Contractor), Contract and Consent requirements.

If there is an environmental incident the contractor's Project Manager will report it to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a Notice to Engineer (NTE) from the contractor's Project Manager.

6.6 Contingency/incident response

If flowable materials are discharged to the environment, the spill response procedures shall be followed, and the material cleaned up and disposed of appropriately. If the material cannot be cleaned up, the Site Supervisor shall seek advice from the Project Manager. All environmental incidents shall be reported to the Contractor's Project Manager.

7 Hazardous substances

Hazardous substances	LOW-MEDIUM

7.1 Environmental risk assessment

Hazardous substances include fuel and lubricants used in the operation and maintenance of vehicles and machinery. Using, storing and handling these substances presents risks to both the receiving environment and to the health and safety of workers.

All hazardous substances stored on site pose a risk as (unintentional) discharges can have significant impacts on humans and the environment. Given the public nature of the site, security of hazardous substance is an important consideration in addition to appropriate storage and containment.

Fuel and lubricants will be used at Laydown Area 1 to fuel, service and maintain the pile driving equipment and other machinery used for construction. Vessel refuelling (diesel) will occur at Daly's Wharf.

The overall environmental risk posed by hazardous substances associated with the replacement Akaroa Wharf is deemed to be **low-medium**.

7.2 Performance standards

Hazardous substances shall not be stored on site outside working hours unless stored in a secure locked containment facility. No hazardous substances shall be stored within 20 m of (or within or over) the CMA. All use and storage of hazardous substances shall comply with the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Staff involved in the use and storage of hazardous substance shall be suitably trained staff in the use and storage as well as how to use spill kits in the event of a spill.

A Tier 1 Marine Oil Response Plan (in accordance with Marine Protection Rules, Part 130B) must be submitted to the Harbourmasters Office (habourmaster@ecan.govt.nz) prior to works commencing.

7.3 Control measures

Table 7-1: Control measures for hazardous substances.

Type of work	Risk	Control
Storage of hazardous substances.	LOW	Store in a secure facility at least 20 m from the CMA. Must be covered and lockable. Do not store incompatible substances together. Have appropriate spill kits located at the storage facility. Where possible, food grade non-petroleum based lubricants should be used for plant and machinery that will be working within the CMA.
Refuelling of plant/equipment on site.	LOW-MEDIUM	Ensure any refuelling of plant/equipment (aside from vessels) is done at least 20 m away from the CMA. Use fuel delivery services to eliminate storing large quantities of fuel on-site.

Type of work	Risk	Control
		Have appropriate spill kit/booms at the refuelling site. No unattended refuelling. All refuelling to be constantly monitored.
Plant/equipment maintenance	LOW-MEDIUM	All plant maintenance shall be undertaken at least 20 m away from the CMA unless a breakdown occurs in the CMA. If this occurs, the plant operator must discuss with the CCC Project Manager before proceeding. The exception to this is the landside crane which cannot retreat back off the staging. Food grade non-petroleum based lubricants shall be used for any equipment used within the CMA. Have appropriate spill kit/booms on site in case of spillage.
Refuelling of barge	LOW-MEDIUM	Barge will be refuelled while berthed at Daly's Wharf. Refuelling must be attended at both the bowser and refuelling point on the vessel to prevent overfilling spills. Have appropriate spill kit/booms on site in case of spillage. Tier 1 Marine Oil Response Plan (in accordance with Marine Protection Rules, Part 130B) to be submitted to the Harbourmasters Office (habourmaster@ecan.govt.nz).

7.4 Monitoring

Continuous observation during refuelling and maintenance. Keep a register of all hazardous substances stored on site, update as substances are used, replaced and new substances stored. This register must be kept at the site office and made available to the Project Manager upon request.

The condition of the hazardous substance store shall be checked on a weekly basis to identify maintenance requirements, security issues and any spills.

The hazardous substance store shall be secure at all times and must be checked at the end of each working day.

7.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the contractor's Project Manager will report it to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the contractor's Project Manager.

7.6 Contingency/incident response

A Spill Response Plan shall be prepared setting out the procedures for how the Contractor will respond to any spills of hazardous substances. This plan shall address all the substances being stored/used on the site and include the provision of spill kits and associated training in their use.

8 Erosion and sediment generation & stormwater management

Erosion and sediment generation and stormwater management	LOW

8.1 Environmental risk assessment

Construction activities that disturb the ground have the potential to generate elevated levels of sediment during rainfall events. Disturbed soils/sediment more easily detaches from the ground surface via wind, rain, or water action. Consequently, if best practice controls are not established to mitigate this increase in erosion, significant adverse environmental effects may occur in the receiving environment.

This section addressed erosion and sediment control on land (i.e. outside the CMA) and construction-phase stormwater control. Disturbance of the CMA is addressed in Section 9.

The erosion and sediment control measures will focus on avoiding and/or reducing erosion which is more effective at minimising adverse effects than sedimentation controls.

The project involves minor amounts of earthworks, primarily associated with the partial removal and replacement of the seawall/abutment at the interface of the wharf with land, and with the trenching for services connections. Stormwater discharge will also be generated from the wharf deck and pontoon decks during the construction phase, which could be contaminated with fuels/oils if spills occur, or waste and debris that could be washed into the CMA.

In the context of the natural sediment flux in this tidal area, the potential quantity of sediment generated during the works is negligible to minor. Notwithstanding this, care should be exercised when undertaking activities that may generate sediment to minimise effects.

Overall, the environmental risks associated with sedimentation and stormwater discharges at the wharf site and laydown areas are deemed to be **low**.

8.2 Performance standards

Stormwater runoff from the construction phase of the project is allowed for under resource consent CRCXXXXXX.

Where stormwater discharges occur directly to the CMA, the water quality standards for class SG (being water managed for shellfish gathering, contact recreation and the maintenance of aquatic ecosystems)[2] apply.

Works shall comply with the conditions of consent CRCXXXXXX including, but not limited to:

- XXX
- XXX
- XXX

[2] Page 157 of the Regional Coastal Environment Plan.

8.3 Control measures

Prior to construction commencing, the contractor shall be responsible for preparing an Erosion and Sediment Control Plan (ESCP). The plan will include a separate site layout plan for Laydown Areas 1 and 2, and for the Akaroa Wharf site. The ESCP will address all potential contaminant-generating activities and contaminant sources at each site. Particular attention will be paid to areas where materials for the temporary reclamation are stockpiled and where demolition materials are stored. Treatment through portable facilities may be required, depending on the nature of the materials.

All control measures shall be in accordance with the requirements and intent of Environment Canterbury's Erosion and Sediment Control Guidelines (ESCG) and The Canterbury Regional Council Erosion & Sediment Control Toolbox for Canterbury, which can be found at http://esccanterbury.co.nz/.

The ESCP, once prepared, will be attached (**Appendix B**).

Table 8-1: Key erosion and sediment control measures.

Type of work	Risk	Controls
All works – Laydown areas.	LOW	Use stabilised entrances during the construction of the laydown areas to prevent tracking sediment offsite. Install cutoff bunds on the upgradient side of the site to prevent clean water running onto the site at unsealed sites (Laydown Area 1 at the Akaroa Recreation Ground) and sites where soil/granular material will be stored. Install sediment control devices on the down-gradient side of the site (if unsealed) to prevent sediment-laden water from discharging off the site. If the site is sealed, sediment control measures will only be needed around soil/gravel stockpiles. Locate sumps that may receive runoff from the laydown area, install sediment control features to prevent sediment entering the sump (filter sock or filter cloth). Stockpile materials away from the water's edge and surround with appropriate sediment control methods.
All works – Akaroa Wharf	LOW	Install cutoff bunds (or similar) at the wharf/land interface to divert water to reduce the amount of water flowing through the site. Runoff from within this portion of the site, following any treatment, to be discharged onto areas of the foreshore protected from erosion to minimise any scour and re-suspension of sediment.
Service trenching	LOW	If upgradient water may run into the excavation area, install cutoff bunds on the upgradient side to prevent clean water running onto the site.

Type of work	Risk	Controls
		Locate sumps that may receive runoff from excavation works, install sediment control features to prevent sediment entering the sump (filter sock or filter cloth). Install sediment control devices on the down-gradient side of the excavation (if unsealed) to prevent sediment-laden water from discharging from the disturbed ground. These may only be necessary at the start and finish of the excavation filling (i.e. when cut/fill levels are near to the surrounding ground levels). Stockpile materials away from the water's edge and surround with appropriate sediment control methods. Minimise open disturbed areas and replace any removed rock armour as soon as practicable.

8.4 Monitoring

Daily inspections of the control measures to check integrity during dry weather. If a rainfall event of >20 mm is forecast, the sediment control measures shall be inspected before the rainfall event. Similarly, inspection is required following a rainfall event >20 mm and any damage shall be repaired, and any accumulated sediment removed. Undertake maintenance as required to ensure the control measures function as designed and remove accumulated sediment as soon as possible.

Works shall comply with the conditions of consent CRCXXXXXX including, but not limited to:

- XXX
- XXX
- XXX

8.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the Contractor's Project Manager will report this to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

8.6 Contingency/incident response

The contractor shall have sufficient spare supplies to maintain the erosion and sediment control features and extra material to install emergency measures if required.

If sediment contaminated water is discharged to the stormwater system, or the marine environment, the Site Supervisor will report the environmental incident to the Contractor's Project Manager.

9 Coastal habitat and processes

Coastal habitat and processes	LOW

9.1 Environmental risk assessment

Akaroa Harbour, including French Bay and Childrens Bay, supports a diverse array of marine life including penguins, avifauna, fish species and invertebrates.

The Akaroa Wharf construction site is predominantly within the marine environment with a narrow corridor of land between the sea and Beach Road available to accommodate vehicles, machinery and materials associated with the construction works. The shoreline immediately north of the existing wharf is an historic sea wall. The high tide reaches the sea wall, and strengthening work, including filling of voids, was undertaken on the section to the north of the wharf during 2021. South of Akaroa Wharf, the discharge from Aylmers Stream has created a sandy deposit at the shoreline adjacent to the sea wall alongside Britomart Reserve.

On either side of the wharf, intertidal gravel, pebbles, cobbles and boulders extend in the subtidal zone and transitions into a soft sediment (sandy mud) bottom. Benthic surveys of the Akaroa Wharf site and the Akaroa Boat Ramp site (where the temporary berth will be constructed), found biota of shallow subtidal sediments were typical of other previously sampled areas within Akaroa Harbour and that the intertidal habitat supported a community of limited diversity, likely due to the absence of bedrock and the mobile nature of the cobble and pebble substrate. The surveys did not identify any marine invertebrates or macroalgae listed as 'Threatened' or 'At Risk' at either site. Intertidal seagrass (*Nanozostera muelleri*), a species and habitat of national conservation importance, was found adjacent to the temporary berth site and dredging spoil will be contained so as to avoid it.

Demolition of the existing Akaroa Wharf will involve removing existing timber piles and removing structural debris from the coastal floor within the CMA. To minimise disturbance and eliminate the need for heavy machinery to directly access the CMA, the demolition and construction works will take place from a barge and from temporary staging.

During construction, dredging to form the temporary berth, barge movements, installation of staging, and piling works all have the potential to cause disturbance and generate sediment. However, direct disturbance of the seabed will be spatially limited and any indirect effects (e.g. from propagation of turbidity plumes) are not expected to exceed natural resuspension events in severity/magnitude except close to the source.

At the conclusion of works, the reclamation will be removed, dredging spoil replaced and the area naturalised in accordance with the Reclamation Rehabilitation Plan (see **Appendix C**).

Overall, the environmental risks to coastal habitats and processes associated with the replacement Akaroa Wharf are deemed to be low.

9.2 Performance standards

Discharge water quality meets the standards in the coastal plan (Coastal water class SG), after reasonable mixing. Minimising the disturbance of the CMA and discharge of sediment plumes, and control of debris is critical to maintaining these standards.

9.3 Control measures

Table 9-1: Control measures to manage coastal habitat and processes.

Type of work	Risk	Control
Wharf demolition (including pile removal and pontoon relocation.)	LOW	Floating boom installed to capture any demolition debris. Regularly inspect the boom and remove debris that have accumulated on the boom. Strip the furniture, fittings and services from the wharf, as far as practicable, before commencing the main demolition. Deconstruct existing wharf in phases by removing decking, capping beams and bracing and lifting into the barge. Use careful deconstruction methods to avoid the loss of debris to the sea. Remove timber piles via barge. Cut remaining piles off at sea floor using hydraulic shears and / or divers. Transport demolition waste to laydown area away from CMA. Ensure debris are not lost to the CMA during the transfer from the barge to the land.
Piling – main wharf and pontoon piles.	LOW	Utilise the most effective and efficient equipment possible for installation of the piles to limit the amount of sediment stirred up. Use a pile guide to position piles in their installation position to avoid dragging the pile across the bed of the sea. During piling works, capture the water used to clean the water column, and the cement-laden water from the tremie pour and contain in settlement and dosing tanks for treatment and prior to discharge.
Piling – temporary berth at Akaroa Boat Ramp	LOW	Utilise the most effective and efficient equipment possible for installation of the piles to limit the amount of sediment stirred up. Use a pile guide to position piles in their installation position to avoid dragging the pile across the bed of the sea.
Dredging for temporary berth at Akaroa Boat Ramp	LOW	Install silt curtains or other containment measures to contain dredging spoil/turbid plume and protect sea grass beds within Childrens Bay. Undertake dredging during calm weather to minimise the generation of sediment plumes.

Type of work	Risk	Control
		Avoid swinging the excavator bucket underwater when full of dredge spoil to reduce sediment plume generation. Dredging spoil to be placed in the CMA immediately southwest of the dredged channel. See Figure 5 for indicative location. A 3 m sediment curtain will be placed around the material to reduce the likelihood of sediment migration. If necessary, the dredge spoil to be re-replaced at the end of the project, in accordance with the Reclamation Rehabilitation Plan.
Temporary reclamation for temporary berth at Akaroa Boat Ramp.	LOW	Scrape and remove loose surface material – to be stored and replaced during site rehabilitation. Apply a layer of geotextile fabric before placement of granular fill and rip rap protection. Remove granular fill and geotextile, and naturalise the reclaimed area at the end of the project in accordance with the Reclamation Rehabilitation Plan.
Barge movements	LOW	Minimise barge movements and speed when in close proximity to the existing wharf, temporary berth and shoreline to limit disturbance of the seabed.

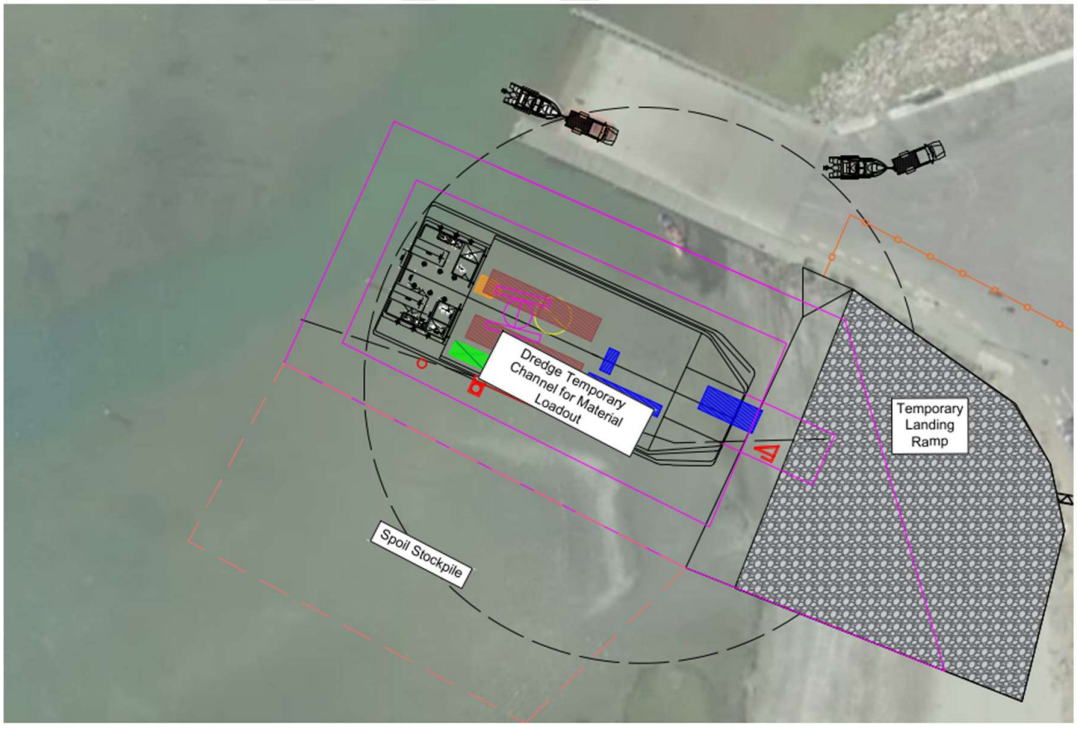

Figure 5: Indicative areas to be dredged and reclaimed, and dredge spoil dumping area alongside the Akaroa Boat Ramp.

9.4 Monitoring

Visual monitoring of sediment plumes and floating debris by site construction team during works to ensure the controls are effective.

Works shall comply with the conditions of consent CRCXXXXXX including, but not limited to:

- XXX
- XXX
- XXX

9.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the Contractor's Project Manager will report this to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager

9.6 Contingency/incident response

The Site Supervisor will report the environmental incident to the Contractor's Project Manager

10 Marine avifauna

Marine avifauna	LOW

10.1 Environmental risk assessment

The wider Akaroa Harbour area provides habitat for a range of coastal, shore and wading birds, and white-flippered penguins (an *At Risk* endemic subspecies that breeds only on Banks Peninsula).

The demolition and construction work at Akaroa Wharf have the potential to impact marine avifauna through habitat loss, injuries/mortalities, disturbance/displacement, food supply and foraging ability, the use of artificial lighting, contamination and debris/litter, and through cumulative effects.

A 2023 field survey recorded species abundance and diversity at six sites; four throughout the wider harbour (Duvauchelle Wharf, Duvauchelle Bay, Robinsons Bay, Takamatua Bay) and two in the vicinity of the construction site (French Bay and Akaroa Wharf). Notably, the survey did not identify any species listed as 'Threatened' or 'At Risk' on the existing Akaroa Wharf structure. (Birds were recorded foraging in the adjacent intertidal habitat, including in French Bay, or roosting on other wharf structures e.g. Drummonds Jetty.)

Five native species were recorded at the Akaroa Wharf and French Bay sites (little shag (*At Risk*), red-billed gull (*At Risk*), southern black-backed gull (*Not Threatened*), variable oystercatcher (*At Risk*) and white-faced heron (*Not Threatened*)).

A survey of two areas of potential white-flippered penguin habitat near the Akaroa Wharf construction site confirmed that no birds were breeding at those locations, including Akaroa Wharf. The assessment also found that high levels of public use and general disturbance in the bays surrounding Akaroa Wharf meaning it does not provide opportunities for other coastal birds to breed.

As the overall environmental risk to marine avifauna during construction are deemed to be low, the effects management is limited to applying the same controls on artificial lighting during construction as proposed for the operational wharf.

10.2 Performance standards

No movement or handling of any marine avifauna without seeking advice from a wildlife specialist.

10.3 Control measures

Table 10-1: Control measures to manage potential effects on marine avifauna.

Type of work	Risk	Control
Project establishment.	LOW	A visual inspection of the site (wharf and laydown areas) prior to construction activities beginning to identify the presence of any nesting birds. If any are found, seek the advice of the project Avifauna Specialist.
Artificial lighting during construction works.	LOW	Lighting kept to the minimum required for safe construction. Lighting should be directed downwards and

Type of work	Risk	Control
		shielded to reduce light projecting horizontally towards coastal waters and avoid light projecting vertically to passing birds.

10.4 Monitoring

A visual inspection of the site (wharf and laydown areas) prior to construction activities beginning to identify the presence of any nesting birds.

Visual monitoring by site construction team during works to ensure lighting is directed downwards and shielded.

Works shall comply with the conditions of consent CRCXXXXXX including, but not limited to:

- XXX
- XXX
- XXX

10.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the Contractor's Project Manager will report this to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

10.6 Contingency/incident response

The Site Supervisor will report the environmental incident to the Contractor's Project Manager.

11 Marine mammals

Marine mammals	LOW-MEDIUM

The marine mammal species most likely to be present in the vicinity of the project area are the endangered Hector's dolphin/upokohue and New Zealand fur seals/kekeno. Both are resident within Akaroa Harbour waters.

Pile driving has been identified as the primary activity that could directly adversely affect marine mammals through physical hearing injuries and/or displacement effects (due to the associated increase in underwater noise emissions from pile-driving).

Preliminary underwater acoustic modelling work was undertaken within the area of the wharf site and found unmitigated pile-driving noise is expected to be detectable throughout mid-harbour waters and throughout French Bay. Given the potential for temporary hearing impairment of Hector's dolphins, management actions are required to avoid these effects. These are set out in a project-specific Marine Mammal Management Plan (MMMP) is attached as **Appendix D**.

Prior to piling works commencing, the *in-situ* noise levels produced from pile-driving activities will be verified and compared to an established underwater noise limit. If necessary, the proposed management measures (i.e., size of shut-down zones, pile strikes per day etc) will be adjusted, based on recommendations from the Marine Mammal Specialist.

12 Marine biosecurity

Marine biosecurity	LOW-MEDIUM

12.1 Environmental risk assessment

Invasive marine species can be spread between harbours through vessel movements and the use of machinery without adequate decontamination measures prior to relocation. A barge is needed for construction activities and as there are no suitable vessels permanently berthed at Akaroa Harbour, the Pataki (see Figure 6), a self-propelled landing barge that operates throughout New Zealand waters, will be used. Its use will be in accordance with a Biosecurity Management Plan (BMP) (see **Appendix E**) prepared for the barge and any marine-based machinery used for construction activities.

Figure 6: Pataki barge to be used for construction activities at Akaroa Wharf. (Credit: Nautilus pacific.)

Invasive species may also be present on the existing wharf structure. Many invasive species can remain viable when disturbed and broken up, leading to further spread via tides, currents and wind. The demolition works have the potential to disturb these species (if present) and lead to further spread. Therefore, specific controls are required to help manage the risks associated with the presence of invasive species.

A 2024 biosecurity survey of the bays in Akaroa Harbour, including vessels and structures in French Bay, did not find the presence of any of the target species on a list of nine unwanted organisms. Although the survey did not find any of the target species, the complete absence cannot be

confirmed and while risk that the demolition and construction work at Akaroa Wharf will result in the spread of invasive unwanted organisms is deemed low, controls are still required.

The survey found a further two common marine pest species – *Undaria pinnatifida* (wakame/Asian seaweed) and *Didemnum vexillum* (carpet sea squirt) in the wider Akaroa Harbour area, with *Undaria pinnatifida* known to be present at the existing wharf. It may be attached to the elements that will be removed during the demolition works. Accordingly, permission will be sought under s52 of the Biosecurity Act 1993.

Overall, the marine biosecurity risks associated with the replacement Akaroa Wharf are deemed to be low-medium.

12.2 Performance Standards

The demolition methodology shall avoid dislodging invasive species as elements are removed and the discharge of any part of an invasive species to the marine environment during material handling or storage.

Marine activities shall be undertaken in accordance with Biosecurity New Zealand's hygiene procedures including ensuring machinery is free of plants and plant seeds prior to use and a Biosecurity Management Plan shall be prepared for the barge and marine-based machinery used for construction activities.

12.3 Control Measures

Table 12-1: Control measures to manage marine biosecurity risks.

Type of Work	Risk	Control
Wharf demolition	LOW	Methodology shall prevent dislodging invasive species (if present) from the marine elements during removal and the discharge of any part of an invasive species. Adhering biological matter will be removed from the piles whilst at the laydown area and placed in covered skip bins to prevent scavenging by birds.
Marine construction equipment in Akaroa Harbour waters.	LOW-MEDIUM	All marine plant from outside Akaroa, that are used for the works, shall have a Biosecurity Management Plan that shall include: • Description of the vessel and its attributes that affect risk (e.g. voyage speed, maintenance history, prior inspection, voyage history since last dry-docking and antifouling). • Description of the key sources of potential marine biosecurity risks.
Akaroa Wharf construction	LOW	All construction materials used in the upgrade of the wharf must be new (rather than used/relocated from outside of Akaroa Harbour). All construction materials removed from the wharf to be recycled for future design elements will be dried, water blasted and retreated prior to being returned to the wharf, free from invasive species on their return.

Type of Work	Risk	Control
Transfer and storage of materials	LOW-MEDIUM	The barge used for the transport of removed elements to laydown areas shall have a method to contain runoff water which may contain fragments of invasive species. If the barge has drains from the containment area, appropriately sized mesh filters should be installed on those drains. The method of transfer to land shall prevent any adhered invasive species from being dislodged and discharged to the marine environment or the intertidal area. Stored timber (and other removed elements) at laydown areas shall be bunded and covered to prevent birds picking biofouling and spreading it outside the storage area.

12.4 Monitoring

Constant monitoring of the demolition operation by the contractor to ensure the demolition and construction methodology achieves the performance standards and that demolition material is securely stored.

Monitoring as per the Biosecurity Management Plan prepared for the barge and machinery used for construction activities.

12.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the Contractor's Project Manager will immediately report this to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

12.6 Contingency / Incident Response

The Site Supervisor will report environmental incidents to the Contractor's Project Manager.

13 Noise and vibration

Noise and vibration	HIGH

The construction work at Akaroa Wharf will require mobile mechanical equipment which can generate elevated levels of noise and vibration. Modelling and assessment by Marshall Day indicate that construction noise levels, with the exception of impact piling near the landward end of the wharf, will be below the applicable limit of 70 dB LAeq at the nearest occupied commercial and residential activities along Beach Road.

Impact piling has the potential to exceed the 70 dB LAeq limit and to manage these potential effects of noise and vibration, a project specific Construction Noise and Vibration Management Plan (CNVMP) will be prepared attached as **Appendix F.**

The effects of noise and vibration generating activities on marine mammals and the associated control measures are set out in the separate Marine Mammal Management Plan in **Appendix D**.

The CNVMP must be submitted to Christchurch City Council for certification at least 5 days prior to the commencement of the works. The certified CNVMP must be followed for the duration of the construction phase.

14 Archaeology

Archaeology	LOW-HIGH

The current Akaroa wharf was constructed in 1887/1888 and is a recorded archaeological site (N36/229). Original elements that remain include the solid landward approach formed by a concrete abutment and the timber jetty, supported by timber piles.

Prior to European settlement, the area now known as Akaroa township was used and occupied by Māori for several centuries and there is a general risk that groundworks at the wharf abutment and laydown areas will uncover sub-surface (Māori and European) archaeological remains.

To manage these risks, an Archaeological Management Plan has been prepared for the project and is attached (see **Appendix G**). An Archaeological Authority has also been obtained for the project and provided with **Appendix G.**

15 Heritage

Heritage	LOW

15.1 Environmental risk assessment

Akaroa Wharf and its surroundings hold significant historical and social, cultural and heritage value. The current wharf, constructed in 1887/1888, replaced an earlier jetty and is integral to Akaroa's identity as a seaside settlement.

The proposed new wharf is approximately the same dimensions as the existing structure, offset by 1.5 – 2.5 m to the north to allow ramp access between the new, higher wharf and the existing commercial buildings which are remaining in situ. While the old and new wharves will share the same physical dimensions, the new wharf will be constructed from different materials and have a modified approach pathway due to changes to the partial removal of the original abutment and the installation of an L-wall.

To mitigate the heritage loss associated with the wharf replacement project, heritage items will be salvaged prior to demolition, the work will be recorded (prior to demolition, during construction and upon completion), and listed heritage items are in proximity to the wharf construction site and laydown areas will be protected and/or monitored. These measures will be formalised in a Historic Heritage Plan (HHP) and a Temporary Protection Plan (TPP) and appended to this document as **Appendix H** and **Appendix I**, respectively.

The HHP will identify the features and material from the 1888 Wharf and abutment which are proposed for salvage and identify the timeframe and methods for the removal, storage and installation of materials within the replacement wharf.

The TPP will identify potential risks to heritage items and setting and set out measures to safeguard them during the demolition of the 1888 Akaroa wharf and abutment and construction of the replacement wharf. It will include the listed heritage setting and heritage items within and adjoining Britomart Reserve, and the protection of the Beach Road Bridge.

15.2 Performance standards

At least twenty working days prior to the commencement of works under this consent, the Consent Holder shall provide a Historic Heritage Plan (HHP) to the Consent Authority Manager. A copy of the HHP shall be provided to the Heritage Team Leader of the Christchurch City Council or by email to rcmon@ccc.govt.nz.

At the completion of works, the heritage items and settings will be returned to their existing condition and all suitable salvaged heritage items re-used on new Akaroa Wharf, repurposed elsewhere or donated to Akaroa Museum.

At the completion of works, a photographic record of the 1888 wharf, its demolition and the construction of the replacement wharf will be provided to Christchurch City Council.

An interpretation panel incorporating the story of the wharf replacement project will be installed to the landward end of the wharf at the completion of works.

Works shall comply with the conditions of consent CRCXXXXXX including, but not limited to:

- XXX
- XXX
- XXX

15.3 Control measures

Table 15-1: Control measures to manage heritage risks.

Type of Work	Risk	Control
Site establishment	LOW	Install protective fencing to provide a 2 m buffer around heritage listed items in accordance with the project TPP and provide monthly monitoring to ensure this protection is maintained. Commence photographic records of the process from prior to demolition through to completed construction.
Akaroa Wharf salvage works	LOW	Ten working days prior to commencement of works, a HHP will be provided to the Heritage Team Leader of the Christchurch City Council or by email to rcmon@ccc.govt.nz. Salvaged timber to be repurposed/recycled for building material where possible. Salvaged iron wharf fittings to be re-used on new wharf or repurposed where possible. Remaining unusable fittings to be offered to Akaroa Museum and to local residents as memorabilia. Continue photographic record of the process from deconstruction through to completed construction.
Abutment removal	LOW	Protect the section of the concrete parapet wall that runs parallel to the shoreline on the southern side of the Wharf. Record external aspects of the concrete abutment components in line with Level 1 of Heritage New Zealand Pouhere Taonga's levels of building recording. Removal the internal fill from the abutment under archaeological supervision. Record the first two bents of the timber jetty structure inline with Level 1 of Heritage New Zealand Pouhere Taonga's levels of building recording. Record representative portions (to be specified in the archaeological management plan) of the remaining parts of timber jetty and associated piles in line with Level 3 of

Type of Work	Risk	Control
		Heritage New Zealand Pouhere Taonga's levels of building recording. Groundworks at Akaroa Recreation Ground to take place under archaeological supervision. Follow Accidental Discovery Protocol (ADP) (**Appendix P**) if an item of potential interest is discovered during any of the works: • Stop work in the affected area (20 m radius) and marking off the affected area. • Notify CCC, Canterbury Regional Council and Heritage New Zealand Pouhere Taonga (HNZPT) of the disturbance. Take a photographic record of the process from demolition through to completed construction.
All wharf and pontoon construction works.	LOW	Take a photographic record of the process from demolition through to completed construction.

15.4 Monitoring

Continuous observation of heritage setting and listed heritage items in accordance with the TPP.

15.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an incident, the Contractor's Project Manager will immediately report this to the CCC Contract Representative and if necessary, to Environment Canterbury and Heritage New Zealand Pouhere Taonga. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

15.6 Contingency/incident response

Follow Accidental Discovery Protocol (ADP).

The Site Supervisor will report the environmental incident to the Contractor's Project Manager.

16 Contaminated land

Contaminated land	MEDIUM

The existing abutment and surrounds at the interface between the wharf and land may contain contaminated fill. Therefore, all material excavated from Akaroa Wharf and the abutment must be removed from the site and disposed of off-site at a facility authorised to receive such material, with the exception of any material to be reinstalled into the replacement wharf.

A Contaminated Site Management Plan (CSMP) will be prepared by a Suitably Qualified and Experienced Practitioner and provided to Council by email to rcmon@ccc.govt.nz no later than 10 working days prior to the commencement of earthworks. No earthworks are to commence until the CSMP has been accepted and installed.

Once prepared, it will be attached as **Appendix J**.

The CSMP must include:

1. A site investigation plan to be undertaken prior to the removal of the abutment or any trenching works, the objective of this investigation shall be:
    - To identify if remedial actions are required for soil contamination that may exist on site.
    - To determine the appropriate disposal location/facility for soil that may need to be removed offsite
2. Stockpiling procedures and controls.
3. The process for the handling and disposal of contaminated soil.
4. Environmental controls to prevent the discharge of contaminants from the site.
5. Documentation requirements to verify the soil has been handled and disposed of correctly.

17 Debris and waste minimisation

Debris and waste minimisation	LOW

17.1 Environmental risk assessment

To create a healthy and prosperous city CCC is seeking to eliminate all harmful materials and chemicals from its public infrastructure. CCC has developed a Resource Efficiency and Greenhouse Gas Emission Policy which must be considered as part of all Council projects. This will ensure new infrastructure is healthy for people and nature, and taking a precautionary approach will help mitigate the future burden of managing and removing harmful materials and the burden on society of caring for those affected.

Measures to minimise waste production, appropriately manage waste generated within the project area, and the future repurposing of products used on each project are key considerations throughout project design and delivery.

For this project, the demolition methodology must include appropriate controls to prevent the loss of material to the harbour during the demolition, in addition to the standard controls covering the reuse and recycling of materials generated during the demolition and construction to divert waste from landfill.

17.2 Performance standards

As a minimum, provision shall be made to separate waste streams to promote recycling and minimise landfill waste.

Demolition shall be undertaken according to materials shall be disposed of to an appropriate facility.

17.3 Control measures

Table 17-1: Debris and waste minimisation control measures.

Type of work	Risk	Controls
Wharf demolition	LOW	Demolition methodology must include debris booms to trap any construction material which may fall into the harbour and demolition methods that avoid materials being broken apart in an uncontrolled manner. Regular inspections and removal of debris from the structure and water during works. Salvaged timber to be repurposed/recycled for building material. Salvaged iron wharf fittings to be re-used on new wharf or repurposed. Demolition material may be re-used at base of rock armour profile.

Type of work	Risk	Controls
		Excess demolition cleanfill to be disposed of to an appropriate local facility (Dacks Quary) to reduce travel distance from source to disposal.
All wharf and pontoon construction works (including laydown areas).	LOW	Minimise waste generation by using reusable products. Collect all waste within a contained area and remove from site on a daily basis to a licenced waste disposal facility. Ensure any waste/recycling collection containers are covered to prevent windblown loss of material and scavenging.
Completion of works.	LOW	All spoil and other waste material from the wharf site and laydown areas on completion of works.

17.4 Monitoring

Visual monitoring and awareness by site construction team for the duration of works.

17.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the contractor's Project Manager will report it to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the contractor's Project Manager.

18 Traffic/site management

Traffic/site management	LOW

The Akaroa Wharf construction area will encompass part of Akaroa's main street (Beach Road), with several accommodation and hospitality businesses located on the opposite side of the road. It is on the main route for foot traffic and road traffic for anyone accessing the Akaroa Wharf and other areas further south. During weekends and holiday periods it can get busy with both pedestrian and vehicle traffic and the risks associated with these will need to be managed for the duration of the project. The construction methodology must maintain traffic flow on Beach Road, limit closure of this road to the absolute minimum, and limit closures to off-peak times where possible.

Laydown areas will be established at the Akaroa Recreation Ground and adjacent to the construction site, and at times, temporary parking restrictions may be required to facilitate construction vehicle manoeuvring between the wharf site and the laydown areas. Where possible, materials will be transported by barge to the wharf site.

An Assessment of Traffic Effects of the temporary construction activities (prepared by Stantec) found that a project of this nature which relies on use of public roads, parking spaces and other boat ramp/wharf areas will have a low level of transport effects provided suitable traffic management processes are implemented.

A Temporary Traffic Management Plan (TTMP) and a Construction Traffic Management Plan (CTMP), for both the Akaroa Wharf and the Akaroa Boat Ramp is required and will be attached as **Appendix K**. specifically details how traffic will be managed during a construction project.

A TTMP submitted to CCC by the contractors is a requirement (outside of the resource consent process) of working in the public road space. In addition, a Construction Traffic Management Plan will be prepared for the project as a condition of consent and attached as **Appendix L**.

The purpose of the CTMP is to ensure that the change in use of roads during construction is suitably planned for by the contractor to ensure the road network operates safely and efficiently and responds to changes in the Akaroa traffic environment such as during holiday weekends. The CTMP will need to address:

a) construction programme and construction activity time restrictions
b) laydown and site access arrangements, and reference to any specific temporary traffic management plans required, including temporary detours if required
c) heavy vehicle travel routes within Akaroa
d) estimated daily heavy traffic volumes
e) management plan for oversize loads (numbers and transport times)
f) driver protocols for ensuring safe access routes through Akaroa
g) monitoring, including recording of actual heavy vehicle movements through Akaroa township, and identifying any route changes that may be necessary
h) Specific planning for movement on public holidays and when cruise ships are in the area
i) communication / complaints arrangements.

The CTMP will be prepared once a contractor is appointed and certified by CCC prior to works commencing.

19 Recreation and tourism

Recreation and tourism	LOW

19.1 Environmental risk assessment

Akaroa Wharf is used for recreation by pedestrians, swimmers, casual fishers, tourists, recreational boats and for dinghy tie-up. It is also used by commercial tour operators to load and unload passengers. During the wharf replacement works, these recreational and commercial activities will be redirected to Dalys and Drummonds Wharves.

The surrounding marine area is also often busy during summer periods and weekends with marine recreational users including powered and non-power watercraft and swimmers, trailered boats (sail and motor), kayaks and windsurfing. A large number of vessels are moored close to the wharf site in French Bay, with users accessing these vessels from shore via small dinghies.

Landside, the area immediately surrounding the wharf construction site accommodates temporary bus parking, hospitality and retail businesses. The proposed laydown areas adjacent to the site, and at the Akaroa Recreation Grounds and Akaroa Boat Ramp are also frequented by recreational users. Access to the public boat ramp will be maintained throughout the project through traffic management though there will be some loss of parking spaces. Similarly, access to the Akaroa Sports Pavilion at the recreation grounds will be maintained, with only the area occupied by Laydown Area 1 inaccessible to the public.

The contractor should be very aware of the timing of their works in relation to surrounding land and marine-based activities (including sports and community events) at the wharf site, temporary berth and the laydown areas, especially during times of likely high use. The presence of a wide range of powered and unpowered craft with a broad range of user skill level, creates potential safety challenges for the use of large marine-based plant and a number of controls are proposed to help mitigate associated risks.

19.2 Performance Standards

The demolition method and timing shall minimise effects on the informal recreational use of the area and shall not create a hazard for other marine users.

19.3 Control Measures

Table 19-1: Control measures to manage risks due to recreation and tourism activities.

Type of Work	Risk	Control
All wharf, berth pocket and pontoon construction works.	LOW	Ensure the works are well communicated to the public and clear direction on how to navigate around the works is provided. Ensure the works (or vessels doing the work) do not cause a hazard for the moored vessels. Use appropriate marker buoys to demark the works site.

Type of Work	Risk	Control
		Ensure all staff are aware of the risks and navigate in a safe manner with slow speeds. Be particularly aware of operating around unpowered craft. Constant observation to ensure the public have not strayed into the works area. Ensure all marine elements (including partially demolished structures) are well marked, including with lights to provide for safe navigation in all conditions. Time all works to avoid periods of high use and planned events as far as practicable. Communicate with user groups/operators in advance of commencing works. Use signage and marine navigational aids as required.

19.4 Monitoring

Constant monitoring during the works to ensure the location of other users are identified.

Regular monitoring of any signage, buoys, and lights to ensure they are secured and operating.

Regular communication with user groups if required.

19.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

19.6 Contingency / Incident Response

The Main Contractor shall ensure it has equipment available should additional navigation safety controls need to be installed.

If there is an incident the Contractor's Project Manager will immediately report this to the CCC Contract Representative and if necessary, to the Harbourmaster, Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

20 Landscape, visual and natural character

Landscape effects	MEDIUM
Visual effects	MEDIUM
Natural character effects	LOW-MEDIUM

20.1 Environmental risk assessment

The demolition and construction associated with the replacement Akaroa Wharf will result in moderate landscape, visual effects during the development period. These are primarily due to the removal of the existing wharf, exclusion of people from laydown areas and closed roads, and the presence of cranes and other construction machinery. Visual effects arise from the construction works occurring adjacent to residential areas, public roads and the foreshore and because the works are set against an open water backdrop. However, these effects will be occurring within a visually complex existing setting, which naturally provides a level of mitigation.

Disturbance of the seabed may result in sediment plumes and the wharf's removal will displace encrusted communities attached to the existing piles, altering natural character values, albeit in a short-term, localised manner. Experiential values will also be impacted, with the presence of cranes, barges, fencing, and a marginal increased vessel activity contrasting with existing natural qualities.

Overall, the resulting landscape, visual and natural character effects arising from the construction works are anticipated to be low-medium and of a temporary nature, lasting only for the duration of works.

20.2 Performance standards

The contractor shall reinstate all areas affected by the works to their condition prior to the works commencing and leave the work areas in a tidy condition.

Temporary reclamation at the Akaroa Boat Ramp removed and naturalised in accordance with the Reclamation Rehabilitation Plan.

Any roading or other Council assets that have been affected/damaged as a result of the construction activities at the site shall be repaired or reinstated in accordance with the relevant Council Construction Standard Specification (CCSS).

20.3 Control measures

Table 20-1: Control measures to manage landscape, visual and natural character risks.

Type of work	Risk	Controls
Reclamation removal at Akaroa Boat Ramp.	LOW	Remove granular fill and geotextile, and naturalisation of the reclaimed area at the end of the project in accordance with the Reclamation Rehabilitation Plan.
Completion of works/demobilisation	LOW	All work areas to be reinstated to their condition prior to the works commencing and work areas left in a tidy condition.

20.4 Monitoring

No specific monitoring requirements.

20.5 Reporting

No specific reporting requirements.

20.6 Contingency/incident response

No specific requirements.

21 Lighting

Lighting	LOW

21.1 Environmental risk assessment

Artificial lighting will only be used to provide safe working conditions at either end of day during the winter months (when daylight hours are reduced) as construction work will be undertaken only between 7.30 am and 6.00 pm, Monday to Saturday, to remain in compliance with the Construction Noise Standard NZS6803:1999.

The following artificial lighting sources may be present during the project either at the wharf construction site or the laydown areas: standard vehicle head and taillights, mobile lighting plant (e.g. diesel powered LED floodlights on extendable poles, typically 9 m high) used for construction activities or as security lights, and interior lights inside portacoms/site offices (which may be visible from the exterior due to lack of window coverings).

Where artificial lighting is used during wharf construction activities, it has the potential to result in direct spill light effects that exceed the maximum thresholds set by the Christchurch District Plan, glare effects where lighting is not installed with horizontal flat glass (e.g. headlights, flashing vehicle safety lights, and safety lighting), and sky glow effects.

These lighting effects can be obtrusive for neighbours. Artificial lighting may also attract avifauna making them visible to predators or resulting in collisions with structures, and attract fish which in turn attracts marine mammals. However, by directing lighting downwards wherever possible and limiting its use, the risk of effects will be reduced to a low level.

21.2 Performance standards

The Christchurch District Plan (Table 6.3.6.1) sets out light spill restrictions per zone:

Zone	Permitted light spill (lux)	Project areas within zone
Commercial Banks Peninsula (CBP)	10	Adjacent to wharf site and Laydown Area 2
Open Space Community Parks Zone (OCP)	4	Laydown Area 1
Residential Banks Peninsula Zone (RBP)	4	Vehicle staging area/Bruce Slipway

Artificial lighting during construction may exceed these restrictions at times to ensure safe working conditions and for security reasons. Therefore, the primary performance standard is to follow the project complaints procedure set out in Section 24.2 to respond to any complaints about construction lighting.

21.3 Control measures

Table 20-1: Control measures to manage risks associated with construction lighting

Type of work	Risk	Controls
All work phases for full duration of project.	LOW	Contractor to undertake a risk analysis for any lighting requirements for each task and duration to ensure health and safety is not compromised and effects to neighbours are minimised. Use of artificial lighting kept to the minimum required for safe construction. Light spill over water avoided. Lighting should be directed downwards and shielded to reduce light projecting horizontally towards coastal waters and to avoid light projecting vertically to passing birds, and to minimise spill light and glare effects for neighbours. Where practicable, reduce the intensity/output of lighting fittings. Locate and aim lighting adjacent to roadways and intersections to ensure safety of road users is not compromised whilst minimising the effects to dwellings. Install blinds to windows and glass doors where portacoms/site offices will be used after dark.

21.4 Monitoring

Visual monitoring against lighting risk analysis during operation of artificial lighting.

21.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the contractor's Project Manager will report it to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the contractor's Project Manager.

22 Dust

Dust	LOW

22.1 Environmental risk assessment

Dust from construction activities, vehicle movements and/or stockpiles can contribute to sediment runoff as well as creating a nuisance to the public, neighbouring properties and adjoining roads. Similarly, odour and plant/vehicle fumes can be offensive to nearby sensitive receptors. Suitable controls are required to avoid offensive or objectionable effects of dust and fumes both on-site and in the surrounding environment.

Recreational users and workers in areas immediately adjacent to the site may be potentially affected by dust (largely associated with the laydown site movements as no earthworks are proposed).

Members of the public using the marine area may also be potentially affected by dust.

22.2 Performance standards

The contractor shall implement methodologies for reducing levels of dust to prevent dust becoming a nuisance for the surrounding area. The measures should include minimising the area of disturbed ground, keeping exposed ground damp, covering stockpiles and appropriate monitoring.

The discharge of dust from construction activities will comply with the conditions of Rule 7.3 of the CARP:

1. *The discharge does not cause or is not likely to cause an adverse effect beyond the boundary of the property of origin when assessed in accordance with Schedule 2 of the CARP.*

The discharge does not cause an offensive or objectionable effect beyond the boundary of the property of origin when assess in accordance with Schedule 2.

22.3 Control measures

Table 22-1: Control measures to manage dust.

Type of work	Risk	Controls
Landside construction works at Akaroa Wharf and laydown areas.	LOW	Ensure any wood cutting/drilling and shaving etc is completed on land away from the water when possible. If the works are being completed on an existing wharf item, make sure there is a collection system in place to collect the dust/cuttings. Ensure that the work is sheltered from the prevailing wind or undertaken during periods of low or no wind. Implement standard dust control measures e.g. wetting, covering and minimising exposed areas. Ensure any exposed ground is stabilised as soon as practical.

22.4 Monitoring

Continuous observation and awareness by site construction team during works

22.5 Reporting

Reporting will be completed as per the Project Management Plan, Contract and Consent requirements.

If there is an environmental incident the Contractor's Project Manager will report this to the CCC Contract Representative and if necessary, to Environment Canterbury. The reporting of the incident will be followed up with a NTE from the Contractor's Project Manager.

22.6 Contingency/incident response

The Site Supervisor will report the environmental incident to the Contractor's Project Manager.

23 Dredging

Dredging	LOW

To facilitate construction activities, and transportation by barge of construction materials, a small loading ramp will be constructed on the southern side of the Akaroa boat ramp. This will require reclamation including the disturbance of the seabed, placement of geotextile, granular fill and rip rap protection. A concrete surface may be required. Up to 4 steel piles (610mm diameter) will be driven along the southern side of the existing boat ramp to form a training wall to facilitate barge loading/unloading.

The seaward approach requires dredging to facilitate barge access / navigation channel. The dredge channel will be to a depth not exceeding 1.5m and extend some 90m from the shoreline at a width of 30m. A total volume of 1500m^3 of seabed will be disturbed (dredged) with the spoil material to be placed in the CMA immediately to the southwest of the dredged channel.

A Dredge Management Plan will be prepared by the contractor prior to works commencing at the site. Once prepared, it will be attached as **Appendix N**.

The Dredge Management Plan must include:

1. Identification of areas for the temporary stockpile of dredged material and confirmation of separation from established seagrass beds.
2. Measures of protection (such as silt fences) against the longshore transport of sediment plumes.
3. Monitoring to identify the avoidance of sediment plumes to an extent that would significantly affect established seagrass beds.

24 Communication/signage

24.1 Signage

At least 10 working days prior to the start of construction, a sign will be erected at the site explaining the nature of the work, timeframes expected for the completion of the works, and a contact name and telephone number.

24.2 Complaints procedure

In the absence of any project specific Communication Plan, the following procedure shall be followed for all complaints:

- All complaints should be immediately directed to the person listed on the signage as the primary point of contact.
- It is important that any interaction with the complainant is polite and does not belittle their concern.
- As soon as the complaint is received it will be recorded on the project complaints register (See **Appendix Q**)
- An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the type of work pending investigation, replace an item of equipment, apply additional control (e.g. water sprayer for dust), or reinstate a damaged control device. However, in some cases it might not be practicable to provide immediate relief. CCC and the complainant will be informed of actions taken.
- Where the initial response does not address the complaint, the CCC Manager will be informed and will undertake (either themselves or delegated to the Contractor) further investigation, corrective action and follow-up monitoring as appropriate. The complainant will be advised of the outcome of this process.
- All actions will be recorded on the project complaints register and the complaint will then be closed.

Complaint recording

Information	Timeframe
Complaint received	Within 24 hours
Complaint closed	Within one week of receipt

All paper/electronic files relating to this CEMP will be kept in the Site Office. This will include:

- A copy of this CEMP and all appendices
- Consultation and complaints registers
- Monitoring/auditing reports
- Signed training/induction records which show that people inducted onto site understand what is required of them under this CEMP

25 Applicability

Enviser Ltd has prepared this report for CCC to assist in managing the construction effects of the replacement of Akaroa Wharf in accordance with the agreed scope. No other party, aside from CCC and its contractors, may rely on this report, or any conclusions or opinions within it, for the management of construction effects without the express written permission of Enviser Ltd. This does not preclude the use of this report to inform the consenting of the project.

The opinions and conclusions within this report are based on the information that was viewed during preparation of the report.

Prepared for Enviser Ltd by:	Authorised for Enviser Ltd by:
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Appendices

Appendix A: Spill Response Procedure

Appendix B: Erosion and Sediment Control Plan (ESCP)

Appendix C: Reclamation Rehabilitation Plan (RRP)

Appendix D: Marine Mammal Management Plan (MMMP)

Appendix E: Biosecurity Management Plan (BMP)

Appendix F: Construction Noise and Vibration Management Plan (CNVP)

Appendix G: Archaeological Management Plan (AMP) & Archaeological Authority 2025-571

Appendix H: Historic Heritage Plan (HHP)

Appendix I: Temporary Protection Plan (TPP)

Appendix J: Contaminated Site Management Plan (CSMP)

Appendix K: Temporary Traffic Management Plan (TTMP)

Appendix L: Construction Traffic Management Plan (CTMP)

Appendix M: Tier 1 Marine Oil Response Plan

Appendix N: Dredge Management Plan

Appendix O: Risk assessment tools

Table A-1: Risk assessment matrix

		Impact				
		Insignificant	**Minor**	**Moderate**	**Major**	**Extreme**
Likelihood	**Almost Certain**	Medium	High	High	Very High	Very High
	Likely	Medium	Medium	High	Very High	Very High
	Possible	Low	Medium	High	High	Very High
	Unlikely	Low	Low	Medium	High	High
	Very Unlikely	N/A	Low	Medium	Medium	High

Table A-2: Risk impact definitions

Element	Insignificant	Minor	Moderate	Major	Extreme
Environmental		Moderate effects on biological or physical environment but little or quickly remedied impact to ecosystem. Short term reversible damage	Serious environmental effects such as displacement of species and partial impairment of ecosystem. Reversible but widespread medium-term impact/damage.	Significant impact on highly valued species or habitats. Reversible, but long-term damage. Some impact not reversible	Long term destruction of highly significant ecosystem or very significant effects on endangered species or habitat. Irreversible damage.
Legislative		Minor non-compliance with no legal / regulatory requirements.	Non-compliance with legal / regulatory requirements, or cessation of works.	Non-compliance with enforcement action, possible prosecution.	Prosecution.
Financial	Operational cost overrun up to $2%	Operational cost overrun of between $2% and $5%	Operational cost overrun of between $5% and $25%	Operational cost overrun of between $25% and $50%	Operational cost overrun greater than $50%.

Element	Insignificant	Minor	Moderate	Major	Extreme
Reputational / Image	No or negligible (one-off) media coverage or comment.	Minor short term media coverage with negative correlation and small/local audience	Negative media coverage with broader audience (regional and/or some national coverage) and involving more than one media agent. Short term focus (<5days).	Negative national media coverage with extended coverage (>5days) involving multiple news and media agents.	Sustained negative national and/or international media coverage, with focus investigative segments, re-occurring coverage and involving multiple news and media agents.
Customers	Negligible or isolated impact to customer(s) with no impact to normal levels of complaints	Impact to small groups of customers with some notable trend/similarity in complaints.	Community group impact with formal/justifiable complaints lodged or complaints in relation to public health.	A number of community groups affected (e.g. with some protest action)	Widespread impact to city population.

Table A-3: Risk likelihood definitions

Rating	Probability	Description
Almost Certain	> 90%	Virtually guaranteed to occur
Likely	> 70%	Will probably occur in most circumstances
Possible	> 40%	Common occurrence
Unlikely	> 10%	Could occur at some stage
Very Unlikely	< 10%	Some history of occurrence

Appendix P: Accidental Discovery Protocol

Appendix Q: Project complaints register