

Appendix D: Draft Construction Environmental Management Plan (CEMP)



Pohara Drainage Improvements

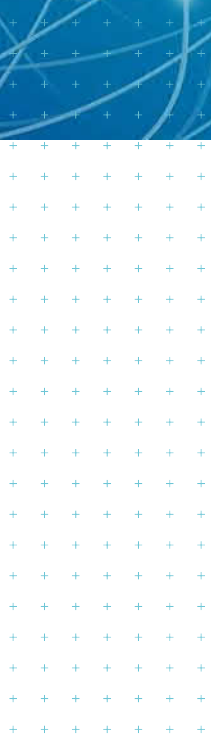
Draft Construction Environmental Management Plan

Prepared for
Tasman District Council

Prepared by
Tonkin & Taylor Ltd

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1 Introduction

The Tasman District Council (TDC) are seeking resource consents for the construction of the Pohara West drainage improvements (the project). This Construction Environmental Management Plan (CEMP) has been prepared to support the resource consent application and sets out the construction and management procedures for these proposed works.

The CEMP details the environmental management activities for the Contractor undertaking the works to ensure compliance with consent requirements.

The objectives of the CEMP are:

- To provide guidance on environmental management for the physical works;
- To comply with the conditions of the Resource Consents and other RMA requirements; and
- To avoid, remedy or mitigate any adverse environmental effects associated with the physical works.

1.1 Statutory requirements

Upon consents being granted by TDC, this section will identify the relevant consent conditions and where these are addressed in the CEMP.

1.2 Contractual requirements

TDC will require the following environmental management responsibilities for its contractors:

- Take all reasonable steps to care for and protect the environment;
- Be familiar with the relevant resource consents;
- Be responsible for the implementation of the CEMP and have appropriate procedures to comply with environmental management requirements; and
- Adhere to the requirements of any other relevant plan that has been prepared for the project (i.e. Health & Safety Plan).

The Contractor will be issued with a controlled copy of the CEMP. A copy of the CEMP will be kept on site at all times that physical works authorised by the associated resource consents is being undertaken.

1.3 Updating the CEMP

The draft CEMP will require to be updated, as a result of the identification of additional methods and feedback from the selected Contractor(s).

A final CEMP will be prepared and submitted to TDC by the selected Contractor(s) for certification prior to works commencing.

It hasn't yet been confirmed whether the proposed works will be undertaken by a single Contractor or split into a number of separate packages to be undertaken by different Contractors. Final CEMP's will be prepared as needed based on the works packages.

1.4 Roles and responsibilities

The Consent Holder shall be responsible for ensuring that the site works are undertaken in accordance with this CEMP. This also includes ensuring that all site staff and subcontractors are aware of and comply with the procedures and the health and safety requirements contained within this document.

Table 1.4: Roles and responsibilities

Title	Name	Responsibilities
Project owner and Consent holder	Tasman District Council	Compliance with the CEMP and resource consents for works. Appointing the Engineer to the Contract and the Contractor.
Engineer to the Contract and Representative	To be appointed	Inspection to ensure that the site works are undertaken in accordance with the finalised CEMP.
Contractor	To be appointed	Implementing site management controls during works, daily inspections, recordkeeping and reporting to Engineer. Updating and finalising the CEMP to reflect proposed construction methods and sequences. Distributing finalised CEMP and any updates to the Engineer. Providing training on CEMP to all workers onsite, and ensuring CEMP is distributed to all sub-contractors.
Site Supervisor (Contractor)	To be appointed	Daily inspections of site. Weekly reporting. Environmental Actions Register.

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2 Project Overview

Numerous properties in the Pohara area experience ongoing flooding issues. Of note was the significant rainfall event in 2011 which caused debris flows, flooding and property damage in Pohara. TDC wish to increase the level of service to properties within the Pohara West floodplain. A number of improvements are proposed to be undertaken at various locations to provide protection to properties affected by flooding of the local creeks. The project involves the following main components:

- Upgrade to 14B Kohikiko Street culvert;
 - Upgrade of twin 900 diameter culvert to be replaced by twin 1350 diameter culverts. Culverts to be embedded to allow for fish passage;
 - New headwall to be constructed;
 - Local channel widening to accommodate the new culverts;
 - Quarry access road to be raised;
 - New timber pole flood barrier along 14B Kohikiko Street property boundary along with new earthfill embankment; and
 - Formation of preferential overland flowpath in the event of culvert blockage.
- Bartlett Creek stopbank between 17 Selwyn Street and 14B Kohikiko;
 - Construction of earth bund along northern side of Bartlett Creek; and
 - New 450 mm diameter culvert to be installed underneath bund to connect Bartlett Creek with the swale that runs along the western side of Abel Tasman Drive.
- Abel Tasman Drive culvert;
 - Upgrade of 1350 diameter culvert with new 4 m by 1.3 m box culvert; and
 - Stream channel widened upstream and downstream of culvert. Downstream channel to be protected with rock armour.
- Lansdowne Street;
 - Raising of a low area on adjacent to 59 Selwyn Street by placement of hard fill.
- Lansdowne Street swale;
 - Minor reshaping and grading of paper road located between Ellis Creek and Clifton Creek.
- 59 Selwyn Street works;
 - New timber pole flood barrier and new earthfill embankment.
- Ellis and Clifton Creek confluence widening;
 - Channel widened; and
 - Installation of rock rip rap to provide protection upstream and downstream of confluence.
- Boyle Street culvert upgrade;
 - Installation of two additional 1200 mm diameter concrete culverts;
 - Stream widened to accommodate new culverts; and
 - Rock armour to be installed to provide protection.

At this stage it is unknown if or how the sites will be allocated and if the same contractor will complete all of the works. Therefore, this CEMP provides a general overview of all the works and sites.

3 Environmental Setting and Principles to Minimise Effects

The project is located in Pohara, Golden Bay. The flood mitigation works span from Kohikiko Place through to Selwyn Street. The works largely take place within the properties listed below:

- 82 Richmond Road;
- SEC 8A Town of Clifton BLK VII Waitapu S D (property adjoining Abel Tasman Drive);
- 59B Selwyn Street;
- 59C Selwyn Street;
- 85 Selwyn Street;
- 89 Selwyn Street;
- 23 Lansdowne Street; and
- 97 Boyle Street.

In addition there will be works in the road reserves of Abel Tasman Drive and Lansdowne Street (Paper Road).

3.1 Potential adverse environmental effects

The project will involve activities that can potentially lead to the following adverse environmental effects:

- Noise;
- Discharge of contaminants to air;
- Discharge of sediment from disturbed land;
- Erosion of soil;
- Contamination of water, soil, ground and stormwater from construction activities;
- Litter;
- Damage to archaeological features;
- Traffic effects;
- Effects on fish, birds, lizards and other fauna; and
- Effects on native vegetation and flora.

3.2 Environmental effects register

Based upon the potential adverse effects listed in Section 3.1 above and the construction activities listed in Section 2 of the CEMP an Environmental Effects Register refer Table 3.1: Environmental Effects Register has been prepared. The purpose of the register is to ensure awareness of potential adverse effects and methods to avoid, minimise or mitigate them throughout the project where possible. The register will be updated throughout the life of the project on a monthly basis by the Environmental and Compliance Manager.

Table 3.1: Environmental Effects Register

Adverse Effect	Cause	Avoidance and/or Minimisation	Potential Mitigation	Proposed Monitoring and Reporting	Contingency
Noise	Equipment in poor condition. Use of unsuitable equipment.	Secure chains, tailgates and fixtures. Good/courteous practices around vehicles. Keep equipment in good condition. Training of operators. Selection of appropriate equipment.	Install noise suppression equipment where possible. Allowable hours of work.	Daily inspection.	Cease work until equipment repaired or climatic conditions allow for resumption of works.
Discharge of contaminants to air.	Dust discharges from earthworks or transport of materials.	Minimise the areas of disturbance. Controlling vehicle speeds. Covering loads. Training of operators.	Water carts or sprinklers to dampen dust sources.	Daily inspection.	When dust becomes a nuisance, work to stop until conditions improve.
Harm to fish	In stream works	Undertake in stream works between October and March to avoid peak migration period. Capture and relocate fish out of the work area.	Fish management plan. Capture and relocate fish out of the work area.	As detailed in the fish management plan.	Work to stop until fish are relocated.
Sediment discharges to water, land, stormwater and/or seawater.	Runoff from disturbed area.	Minimise the area of disturbance. Compact and cover all stockpiles. Avoid direct discharge of runoff into the stormwater system.	Treatment using cut off drains, silt fences, DEBs, filter socks, hard site access routes and settlement tanks.	Daily inspection. Weekly and monthly reports.	Increase the capacity and scale of sediment treatment works.
	Discharge of sediment laden water from dewatering process.	Prevent water from entering the excavations. Avoid scour/erosion when	Treatment using sediment tanks, etc.	Daily inspection.	Increase the capacity of sediment treatment works.

Adverse Effect	Cause	Avoidance and/or Minimisation	Potential Mitigation	Proposed Monitoring and Reporting	Contingency
		discharging, e.g. discharge across a geotextile mat.			Work to stop until conditions improve.
	Discharge of sediment laden water from in stream works.	Divert stream away from works area e.g. overpumping from upstream to downstream. Plan works for when weather forecast is dry.	Use of silt fences / straw bales downstream of the works area.	Daily inspection.	Work to stop until conditions improve.
Erosion of soil	Runoff from adjacent areas.	Prevent water from entering the excavations. Limit areas of open excavation.	Don't open new trench when poor weather forecast. Fill / repair erosion damage.	Daily inspection.	Work to stop until conditions improve.
Discharge of contaminants to water, ground, ground water, and stormwater.	Discharge of oil, fuel, cement slurry or hazardous substances.	Ensure proper storage facilities are available. Ensure proper handling procedures are used. Ensure equipment is in good condition. Training of operators. Ensure adequate storage / tankering available when working at the pump stations.	Bunded storage areas. Dispersants to be available. Use dangerous goods stores. Use wash out and settlement pits for cement slurry. Emergency spill kit available on site at all times.	Weekly inspections of storage facilities. Inspection of fuelling operations.	Alert TDC of any spills. Spill kits to be carried with fuel tankers. Spill kits to be located in close proximity to operating equipment. Follow emergency spill procedures including removal of contaminated material.
Litter	Waste materials not cleaned up.	Ensure waste bins are readily available. Training.	Establish regular collection and disposal service.	Daily inspection.	Clean up litter.
Damage to / loss of native vegetation	Removal of vegetation to construct flood wall / bund.	Align bund/ wall on site to avoid vegetation. – agree with landowners.	Minimise removal of natives – agree with landowners.	Daily reporting in affected zones.	
Harm to nesting birds	Clearance of vegetation	Undertake vegetation clearance outside	Ecologist on site to check that no nesting birds	Daily inspection.	If bird nests are found, works are only

Adverse Effect	Cause	Avoidance and/or Minimisation	Potential Mitigation	Proposed Monitoring and Reporting	Contingency
	where birds are nesting.	of breeding season (September – February).	are present prior to starting work.		to be commenced once the birds have fledged, or the nest has naturally been abandoned.
Harm to lizards (Selwyn Street West)	Removal of vegetation to construct flood wall / bund.	Minimise vegetation clearance.	Lizard management plan - check for the presence of lizards / move / relocate / provide alternative habitat in advance of site works.	As detailed in the lizard management plan.	
Damage to archaeological items.	Excavation of earth and placement of fill.	Identify areas of potential remains in advance. Use a monitor in probable areas / as required.	Ongoing liaison with project archaeologist and iwi monitors.	Ongoing project monitoring.	Work to stop until archaeologist approves further work.
Traffic effects on Abel Tasman Drive	Excavation within the road carriageway.	No work in peak holiday season. Work in one lane only.	Traffic Management measures. Advance warning and communications with residents and businesses so they can plan around works.	Daily assessments of whether any adverse effects on traffic.	Work at night when pipe has to cross road.
Nuisance effects on property occupiers.	Working within private property close to dwellings.	Programme works for when occupiers are not on site.	Advance warning and communications with residents and businesses so they can plan around works.	Daily communication with residents.	

4 Procedures

This section identifies a series of procedures that will be adopted to avoid, minimise or mitigate adverse environmental effects during the construction of the Pohara West Drainage Improvements. The procedures cover the following:

- Approved plans and commencement of works;
- Operating hours;
- Construction area;
- Site access and security;
- Earthworks;
- Stream works;
- Sediment control;
- Dust control;
- Machinery condition and operation;
- Noise control;
- Storage of fuels, lubricants and hazardous material;
- Waste management; and
- Sewage.

4.1 Approved plans and commencement of works

No part of the works will be undertaken until a construction method statement has been prepared by the Contractor and approved by the Engineer.

No part of the works will be undertaken until a fauna management plan (including plans for fish, lizards and birds) has been prepared by the Contractor and approved by the Engineer.

No earth works will be undertaken until the Site Supervisor has inspected the marked out area and confirmed the location and extent of earthworks are in accordance with the design drawings.

4.2 Hours of work

The works will generally be carried out from 07:00 to 18:00 five days a week (Monday to Friday). Noisy machinery shall be operated only from 8.00 am when residences are nearby.

Construction to be programmed to take account of the following restrictions:-

- Along Abel Tasman Drive to occur outside of the peak holiday season of mid-December to mid-February;
- In stream works to take place between October and March to avoid peak fish migration season; and
- Undertake vegetation clearance to take place outside of bird breeding season of September – February.

4.3 Construction areas

Construction will occur at a number of different locations and may be split into separate work packages rather than a single package of work (details yet to be confirmed).

The ten distinct work areas / work types where construction and related works will occur are:

- New culverts and associated works adjacent to 14B Kohikiko Place;
- Earth bund from Kohikoko Place to the east side of Abel Tasman Drive;
- New culvert and associated work at Abel Tasman Drive;
- Earth bund to the west of Abel Tasman Drive from 1 to 17 Selwyn Street;
- Infilling on Lansdowne Road;
- Swale drain along Lansdowne Road;
- Earth bund and associated retaining wall and stormwater pipeline at 59B Selwyn Street;
- Timber Pole Flood Barrier / Earth bund around 59B and 59C Selwyn Street;
- New Stormwater pipeline from 89 Selwyn Street;
- Channel excavation and rock protection at the junction of Bartlett and Clifton Creeks;
- New Culverts at Boyle Street; and
- The Contractors construction yard(s) (location and requirement to be confirmed by Contractor (s)).

Suitable signage, fencing or other measures shall define those areas as a “Construction Zone” and prevent public access.

4.4 Site access and security

Access to the site will be limited to people who have been inducted.

Any legitimate short term visitors will be escorted by a member of staff at all times.

Construction yards and other areas may also need to be locked or made secure at certain times of the work.

4.5 Parking

Parking will be at the construction / compound areas or other designated areas off the road. The Contractor will ensure appropriate traffic management measures are in place in relation to vehicle movements.

4.6 Earthworks

Prior to any earthworks commencing, the Site Supervisor will confirm that all environmental controls are in place and the potential location of any archaeological sites or wahi tapu are identified and archaeological monitoring is in place where required.

4.7 Stream Works

Stream works will be undertaken between October and March during low flow conditions. Where possible when constructing the new culverts or other in stream works the flows in the streams will be maintained, away from the work area and through the existing culvert / stream, where not possible over pumping may be required. Silt fences and straw bales should be installed downstream of any excavations which will catch any falling debris.

Stream works methodologies are to be prepared by the Contractor for each works location / type and be approved by the Engineer and TDC's regulator prior to construction.

4.8 Erosion and sediment control

The works have the potential to cause adverse erosion and sedimentation effects. Section 8 below sets out an outline Erosion and Sediment Control Plan for the proposed works. Erosion and sediment control measures are to be installed before any work begins. Detailed Erosion and Sediment Control Plans are to be prepared by the Contractor for each works location / type above and approved by the Engineer and TDC's regulator prior to construction.

Control measures may include minimising the extent of disturbance, stabilising erodible surfaces, cut-off drains and silt fences.

4.9 Dust control

Dust can be generated from areas of bare soil and from the delivery or movement of materials.

Areas that may produce dust will be kept to a minimum and they will be compacted and covered if necessary. Access tracks and roads will be kept clean and a water cart will be used to limit any dust produced. A tyre wash will be used for access from the compound to the main road. Strict control of vehicle speed will also limit dust generation.

4.10 Trench dewatering

Some of the excavations may intersect the water table, requiring dewatering of trenches and other excavation sites. Dewatering could result in sediment laden discharges to land or water. The Contractor will be required to minimise the effects of the sediment load on the receiving environment. Treatment could include sediment tanks or other settlement device prior to discharge.

4.11 Noise

The works will be carried out in accordance with New Zealand Standard NZS 6803: 1999 'Acoustics-Construction Noise'. To meet these requirements, the Contractor will need to minimise the effects of noise generation during the works. This should include in their planning of the work, such factors as placing of plant, programming the sequence of operations and other management functions. Where possible, the Contractor will ensure noise producing plant is equipped with silencers and noise insulation. Plant shall be properly maintained to reduce the potential noise impact, Machinery condition and operation.

All construction machinery to be used on site will be required to be in a good state of repair and maintained in that condition during the project.

The Site Supervisor and or Site Engineer will identify any machinery that is in a poor state or condition and will ensure the necessary steps to have the equipment repaired or removed from site.

Examples of poor condition would be:

- Missing engine panels;
- Fuel and hydraulic oil leaks;
- Broken or damaged exhaust systems; and
- Loose equipment that causes unnecessary noise – chains/hatches/covers/lids.

4.12 Storage of fuels, lubricants and hazardous materials

It is envisaged that mobile tankers or trailers will be used to fuel plant on site. All fuel tankers will carry a suitable spill kit. If bulk storage of fuel is planned for the project then the Contractor shall provide bunding and containment measures to prevent spillage of fuel.

A dedicated hazardous substances container will be used on site to store all hazardous materials. These hazardous substances to be stored will include fuels for hand-held equipment, lubricants and oils and construction chemicals. The storage container will have an internal bund to capture and contain any spillages. Gas bottles will be stored in external racks with large vents to minimise the risk of any gas build up.

An inventory of fuel, lubricants and hazardous materials will be maintained and checked on a monthly basis to ensure there is no leakage of these materials. All storage facilities will be inspected on a weekly basis to ensure that there is no leakage of materials. MSD sheets for all substances will be kept in the storage container and site office.

A sign identifying the spills protocol will be placed on the wall of the container.

4.13 Waste management

Bins will be provided around the site for the placement of waste material. The bins will be covered and be emptied on a regular basis. The bins will be the only facility on site where waste may be placed.

4.14 Sewage from site works

Only toilet facilities with holding tanks or attached to the TDC's sewage system will be permitted on site.

Facilities with a suitably sized septic / holding tank will be installed at the construction yard if there is no possible connection to the TDC sewer.

4.15 Decommissioning of site

Once the proposed works have been constructed and is operational each area will be cleaned up and the site reinstated to the original state unless shown otherwise on the drawings.

Any and all hazardous materials will be removed from site as part of the decommissioning process.

4.16 Health & safety

The awarded Contractor will prepare a health and safety plan for the project as a separate document. The Health & Safety document will be prepared in accordance with the Health and Safety at Work Act 2015 (HSWA) and any other appropriate Regulations, and will include (but not be limited to):

- Hazard analysis, and control of identified hazards (e.g. working around water, unstable ground. existing services, remote area);
- Planning and communication procedures;
- Staff competency and training;
- Procedures for managing hazardous material if required (i.e. fuel); and
- An Emergency Plan, which includes procedures for ceasing works under heavy rainfall and potential flood conditions (refer section 6.2).

5 Inspections, Reporting and Recording

The Contractor will undertake regular inspections and audits of the construction activities and will report and maintain records of the outcome of these. In addition records and responses to incidents to public inquiries or complaints will be maintained.

5.1 Inspections/audits

A number of inspections are required to ensure compliance with the CEMP.

The Contractor will undertake the following inspections:

- Daily site inspection by the site supervisors; and
- Weekly audit by the site based environmental and compliance manager.

The inspections/audit will cover the following:

- The security;
- Entrances ways for tracking of mud;
- Public road access to the works area condition;
- Stormwater treatment measures;
- Machinery condition;
- Waste management and litter;
- Noise, vibration and dust prevention measures; and
- Hazardous substance storage facilities and use of substances.

To assist in undertaking these inspections and audits a check sheet will be used. A copy of the check sheet can be found in Appendix B. The inspections will record non-compliances or improvements.

5.2 Reports

A monthly report will be prepared by the Site Supervisor which will include reporting on compliance with the CEMP.

5.3 Incidents

An incident register will be maintained to record any incidents onsite that may be considered to have potential for adverse environmental effects. Such incidents include:

- Discharges from un stabilised areas not treated by erosion and sediment control measures;
- Failure of any erosion and sediment control measures;
- Any spill of fuel, wastewater or hazardous substances; and
- Any other incident which either directly or indirectly causes, or is likely to cause, adverse environmental effects.

5.4 Monitoring

In addition to the inspections ongoing monitoring of noise and vibration, air quality and stormwater quality will be undertaken. The results of the monitoring will be used to assist in reviewing the effectiveness of the environmental management and the individual construction method statements.

5.5 Records

The following records will be maintained in the Site Office:

- Daily Inspections;
- Weekly Reports;
- Monthly Reports;
- Incident records;
- Site induction register; and
- Training records.

5.6 Documentation

The following documentation will be kept in the site office as reference material:

- Resource Consent conditions;
- CEMP – and any subsequent updates;
- Construction, commissioning and decommissioning method statements; and
- Health & Safety Plan.

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6 Contingencies

There is potential for unforeseen events to occur resulting in emergency action being required. Unforeseen events may include:

- Natural Hazards:
 - Earthquakes;
 - Floods;
 - Extreme rainfall events;
 - Extreme wind events; and
 - Tsunamis.
- Operational Errors;
- Failure of Equipment;
- Ecological events; and
- Vandalism.

The potential outcome of these emergency events is:

- Discharges of sediment to storm water;
- Discharges of fuels, lubricants or hazardous materials into stormwater and / or ground water; and
- Discharges to air of nuisance dust emissions or contaminants.

6.1 Discharges of sediment

The most likely reason for the discharge of sediment from site would be an extreme rainfall event or poor performance of a treatment device.

When this occurs all practical steps will be taken to remove any sediment discharged from the site and deposited on the road or in the field next to pump station. These actions will include:

- Clearing of field area;
- Cleaning out of shoulder drains and sumps downstream of the site; and
- Advise TDC of the event.

Following the event a review will be undertaken of the reasons for the discharge and what improvements are required to prevent a reoccurrence.

6.2 Discharge of fuel, lubricants and hazardous materials

The nature of the risk of discharges of fuel, lubricants and hazardous materials varies depending upon the volume of materials involved and location. Section 5.11 identifies the actions to be taken to minimise the potential for a discharge of fuel lubricants or hazardous substances. In the event of a spill the following procedure will be followed:

- Evaluate the material being spilled to determine nature of risk and volume of material;
- Report spillage to the Site Supervisor and Environmental and Compliance Manager;
- Stop all operations in the immediate area of concern and remove or shut down any ignition sources;
- Wear protective clothing;
- Isolate the source of spillage by closing off valves, rotating punctured drums, plugging leaks;

- Contain and control the spill by using a spill kit and dispersants and if necessary use earth moving equipment to create an earth bund to contain the spill;
- Start clean up and request help if necessary;
- Dispose of material used in clean-up to a consented landfill;
- Clean-up site and remove all contaminated soil to a consented landfill;
- Replace used material in spill kits;
- Review contingency plan and procedures by determining the cause and the actions taken to contain and clean up the spill; and
- Amend site operational procedures and oil spill response as necessary.

6.3 Air discharges

In the event of dust or contaminants being discharged into the air, the first action will be to stop the discharge. This will be achieved by wet-down or covering the source of dust or shutting-off the source of contaminant.

Once the discharge is stopped, action will be taken to avoid, mitigate or eliminate the risk of re-occurrence.

6.4 Fire

Fire extinguishers will be carried on all vehicles and at site offices. In the event of a fire being identified the first action will be to extinguish the fire if possible. If it is not possible to extinguish the fire, the Fire Service will be contacted.

6.5 Review

Immediately following an event where a contingency action was required, a review of the circumstances leading to the event will be examined, along with the response and its effectiveness. Based upon the outcome of the review, the CEMP may be updated.

7 Traffic Management Plan (TMP)

The Contractor will be responsible for development of the Traffic Management Plan (TMP) and management of traffic within the project area. Effective Temporary Traffic Management (TTM) planning and implementation during construction of the project is critical to the success of the project.

The Abel Tasman Drive culvert crosses the main road into Pohara. This may require the closure of one lane of the main road in and out of Pohara for extended periods of time.

Work will also be required in the road for Boyle Street culvert.

Objectives of the TMP are:

- Manage the effects of construction traffic to minimise impacts for road users, cyclists, pedestrians, residents and local businesses;
- Manage any roading improvements [if required] in advance of transport of construction materials to provide a safe road environment;
- Provide TTM that complies with the relevant standards;
- Focus on safety in transport and TTM;
- Limit where possible the number of construction vehicle trips on the roads;
- Minimise the impact of construction parking;
- Development of traffic management plans having consideration for key stakeholders including road users, cycle trail users, residents, businesses and Council;
- Provide effective communication to affected parties; and
- Identify issues and have a planned traffic management plan submitted to and approved by the relevant Road Controlling Authority (RCA) before implementation.

7.1 Standards

The following standards shall be adhered to in planning and implementing TTM during construction of the Project:

- 1 NZTA Code of Practice for Temporary Traffic Management (COPTTM);
- 2 NZTA Manual of Traffic Signs and Markings (MOTSAM);
- 3 Austroads "Road Design" and "Traffic Management" guides; and
- 4 TDC requirements.

7.2 Temporary Traffic Management

In order to provide TTM that will meet the objectives listed above, the following impacts shall be identified and considered in the design and delivery of TTM:

- Communication and the need to inform the public of changes or activities occurring on the roads;
- The effect TTM activities will have on traffic flows;
- The impact of incidents/crashes;
- The effect of TTM activities on key stakeholders, school buses, road users, cyclists, business and local residents;
- Special events;
- The impact on road condition from the use of construction vehicles; and

- The effect on safety of road users.

The impact of noise and dust will be managed through the construction process and is detailed elsewhere in the CEMP.

7.3 Construction sequencing

The TMP will present the details of sources of key materials such as fill, how much traffic will use particular portions of road, as well as the approximate durations. In particular, it will provide the detailed schedule of the various work stages as the construction process proceeds. From this, the various parties will be able to understand the type and frequency of vehicles to expect, and where construction traffic can be expected.

In general, the following key requirements shall be followed:

- TTM implementation will take into account special events and the needs of stakeholders in the area. Special consideration shall be given for implementing TTM during high risk periods such as the weekend;
- Parking of site vehicles and visitors on within site compounds and other designated areas shall be provided;
- Access to all businesses and residents will be maintained at all times except where not possible for short durations where specific activities are taking place. In the event that access is not possible for short durations then the affected businesses or residents will be given advance notice of this;
- Safe pedestrian and cycle access will be maintained at all times; and
- Noise and dust impacts will be managed through appropriate management plans.

7.3.1 Site Specific Temporary Traffic Management Planning

Site Specific Temporary Traffic Management Plan's (SSTMPs) are documents that outline the TTM procedures to be implemented to ensure the safety of both the public and contractors is maintained throughout the duration of each construction activity.

Following programming of construction tasks associated TTM requirements shall be identified and SSTMPs prepared to ensure construction activity is conducted using an approved methodology, with agreed mitigation measures in place. There need not be a unique SSTMP for every construction activity, where appropriate generic SSTMPs can be used.

7.3.2 SSTMP development

Each SSTMP prepared shall comply with the principals detailed in this CTMP and each of the relevant standards outlined in Section 2. Templates of a standard SSTMP can be found in COPTTM:

<http://www.nzta.govt.nz/resources/code-temp-traffic-management/copttm.html>

Long term and short term SSTMPs may be required for the Project.

Long term SSTMP's relate to sites that require continuous TTM, such as:

- Site access;
- Trenching works; and
- Road maintenance works.

Short term SSTMP's relate to discrete activities, such as:

- Surfacing pavement works;

- Remedial works; and
- Delivery of plant and materials.

At the completion of all TTM activities the site must be made safe for the travelling public such that no hazard remains as a result of the work. Construction methodologies shall maintain safety and the level of service provided to the travelling public at all times.

7.4 Special considerations

The following sets out the special considerations the Contractor shall address in the detail of all TTM activities and health and safety procedures during construction.

7.4.1 Delay

Under COPTTM, delays caused by the TTM are generally not permitted to be greater than five minutes in typical traffic conditions. All practical steps shall be undertaken to minimise traffic effects caused by construction activities or TTM measures. The impact of TTM shall be considered in each SSTMP, including the expected level of delay in order to satisfy that the impacts are understood.

Where delays are deemed to be unacceptable, construction staging methodologies will be revised to reduce the duration or impact of the activity.

7.4.2 Site access

Site access points will be clearly defined prior to construction. The site specific requirements for use of site accesses will be outlined in this CTMP, which may include but is not limited to:

- Required signage and delineation;
- Permitted entry and exit movements;
- Permitted hours of use;
- Measures to be put in place, including TTM to ensure general public safety; and
- Types of vehicles allowed, and any procedures related to particular classes of vehicles (including oversize or over dimension loads).

Entry and exit movements will be operated in a manner that will minimise disruption to other road users and maximise safety.

7.4.3 Road improvements

The CTMP will detail the design, standard, construction programme and temporary traffic management arrangements for the nominated transport routes, any improvements to the routes (if required) as well as maintenance programmes during construction.

Detailed plans will be prepared in conjunction with adjoining landowners, businesses and Council.

7.4.4 Passenger transport services

At this stage it is anticipated that construction activities will not impact on school bus operations, although care must be taken when passing loading/unloading busses and school children waiting for busses.

Activities likely to impact on school bus services will be identified at the construction planning stage to allow for methodologies to be developed to minimise impacts.

It is recommended that construction traffic is limited to 30 km/h when passing children walking along or waiting beside any roads.

7.4.5 Stock

Farmers will be able to continue to use roads to move stock if needed. It is recommended that farmers have the ability to notify the project team of stock movements which are planned in advance, so that construction deliveries can be managed accordingly.

Drivers are to be made aware of the risk of encountering wandering stock on roads.

7.4.6 Residents

Construction vehicle travel at night on roads in close vicinity to dwellings may cause amenity issues.

Drivers shall exhibit the following behaviours:

- Constant travel speeds, minimising accelerating and braking;
- Avoiding leaving vehicles idling for long periods of time; and
- Minimise vehicle movements in the early morning and early evening periods and avoid any vehicle movements at night.

7.5 Implementation

Implementation of TTM shall be in accordance with COPTTM and the approved SSTMP.

All delivery of plant and materials to the site shall be conducted via approved site accesses. Where the delivery of plant or materials requires TTM, the activity will be conducted under an approved SSTMP.

Over-dimension or overweight vehicle loads that require special measures for delivery, will be advised to the STMS 24 hours in advance to arrange for special requirements. A SSTMP will be implemented if required.

Movement of overweight and over-dimension vehicles will be conducted according to any required permits.

7.5.1 Emergencies

An emergency action plan will be produced prior to implementation of any TTM activities. The plan will outline procedures, requirements and responsibilities in the case of an emergency. In addition to this plan, each SSTMP will address specific requirements in the case of an emergency.

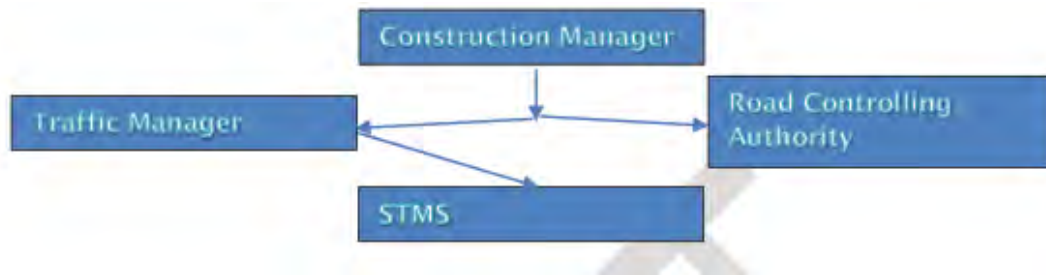
In the event of a crash or significant incident, the Contractor will provide immediate assistance and where necessary, contact the emergency services. Incident reports shall be completed for all incidents or near-misses.

Emergency Contact: TBA

DDI:

7.5.2 Team structure

(Note the fields below will be completed as part of the development of this CTMP). The TTM Team is responsible for developing, implementing and managing all TTM measures in accordance with the relevant standards in Section 2 and the approved SSTMP's.



7.5.2.1 Construction Manager

The Construction Manager will be responsible for delivering resources to ensure TTM is managed and maintained

Contact: TBA
DDI:
Email:

7.5.2.2 Road Controlling Authority

The role of the Road Controlling Authority (RCA) is detailed in COPTTM. The RCA will be consulted in both the content and appropriateness of TTM measures that have been applied for and for approvals.

TDC TMC: TBA
DDI:
Email:

7.5.2.3 Traffic Manager

There may be a Traffic Manager as part of the Project. Due to the nature of this role in this Project it may be held by a member of the construction team. The Traffic Manager has the responsibility for safe operation of the traffic control measures and will design and plan TTM activities. The Traffic Manager will have responsibility for gaining approval of all SSTMP's.

Contact: TBA
DDI:
Email:

7.5.2.4 Site Traffic Management Supervisor

A designated Site Traffic Management Supervisor (STMS) will supervise TTM on-site, providing 24 hour coverage if necessary. Due to the nature of this role in this Project it may be held by a member of the construction team and may be a dual role as Traffic Manager. The STMS has the ultimate responsibility for overall traffic management at the site. The STMS will inspect the site in accordance with COPTTM and ensure the site remains in satisfactory condition.

STMS: TBA
DDI:
Email:

7.6 Approvals

An internal approval procedure will be implemented by the Contractor to address all relevant issues and provide necessary notice and consultation prior to application for the SSTMP's.

The SSTMP shall be prepared and reviewed for compliance with COPTTM and issued to the approvals team of the RCA. [Note the fields below will be completed as part of the development of this CTMP].

All TTM applications will go to the following contact as appropriate:

CIC TMC: TBA
DDI:
Email:

All departures from COPTTM will be addressed via the EED process outline by COPTTM.

The Contractor is to allow up to five days for certification of a SSTMP.

7.7 Monitoring

The CTMP will provide a detailed schedule of the various elements of monitoring relating to public roads and transport. This will include:

- Traffic generation levels;
- Pavement condition;
- Major activities;
- Safety and methodology of oversize load piloting; and
- Public feedback.

The schedule will also include the specific data to be measured, the method of monitoring, the frequency with which monitoring will be undertaken, trigger levels for intervention, and the corresponding response.

7.8 Communications

Communication protocols are important to the success of the CTMP. This includes providing information to the community, receiving responses back, and communication with project drivers.

Specific contact arrangements will be made for farmers and other members of the community to contact the project team. Information, including planned stock shifts, will then be communicated to project drivers enabling them to anticipate the occurrence and reduce their speed as appropriate.

Finally, the CTMP will record a list of people and organisations that the CTMP will be distributed to. All amendments and updates to the CTMP will then be forwarded to those named on the list.

All feedback on the operation of the SSTMP is to be directed to the Site Traffic Management Supervisor (STMS). The STMS will be contactable by phone or two-way radio for the duration of the Project.

STMS: TBA
DDI:
Email:

8 Erosion and Sediment Control Plan (ESCP)

This ESCP demonstrates the proposed approach for erosion and sediment control for the project. It provides a framework for the management of earthworks to avoid accelerating or causing the generation of sediment, and, where this is not possible effective and efficient treatment

This ESCP shall be prepared by the Contractor in accordance with Tasman District Council's Engineering Standards and the requirements below.

8.1 Objectives

This ESCP has been developed in line with the following four fundamental objectives:

- Control run-on water;
- Separate clean from dirty water;
- Protect the land surface from erosion; and
- Prevent sediment from leaving the site.

8.2 Erosion sediment control practices

In order to minimise sediment discharges and provide effective treatment, a range of best practice erosion and sediment control measures that will be used are outlined in Table 8.1 and Table 8.2 below. They are split into erosion control and sediment control practices which can be used in response to the different aspects of the project.

The proposed works will involve approximately 350 m³ of excavation, and 2,500 m³ of fill within a proximity to a water body, along with in-stream construction works and the construction of flood protection structures.

Erosion and sediment control measures for this work will primarily involve:

- Staging the bund earthworks to minimise the area of exposed soil;
- Sediment fences around the sites to preventing the discharge of sediment;
- Constructing all exposed surfaces so stormwater flows in a controlled manner to minimize erosion; and
- Stream diversion by temporary damming and fluming or over pumping.

Temporary stockpiles of earth and fill material will be protected from surface water by covering the surfaces or, where required, bunding around the stockpiles.

Table 8.1: Erosion Control Practice

Erosion control practice	Comment
Minimising extent of disturbance	Careful control of works (e.g. staging of excavation and rehabilitation of work areas quickly) will minimise the areas of exposed earth and the duration of disturbance.
Stabilisation of erodible surfaces (e.g. access tracks, stockpiles)	Sealing off surfaces - Areas of loose, fine grain material will be rolled at the end of each day to seal the surface, in order to minimise the entrainment of sediment in the event of rain. Grassing and soil surface mulching in grassed areas.
Perimeter diversion measures	Diversion channels will divert upslope runoff away from areas of disturbance.

Table 8.2: Sediment Control Practices

Sediment control practice	Comment
Sediment fences	Where required, sediment fences will be erected to intercept sheet flow, and will be constructed in general accordance with Drawing No. 506 in the TDC Engineering Standards.
Filter socks	If required, filter socks will be used in conjunction with sediment fences, as an easily portable perimeter control to trap sediment in sheet flow runoff.

8.3 Maintenance and monitoring

8.3.1 Maintenance

Erosion and sediment control devices will be regularly monitored and maintained to ensure their ongoing effective operation. General visual inspections around the site will be undertaken by the Contractor at the end of every working day and after a major rainfall event. The Engineer will undertake a formal erosion and sediment control audit every two weeks (as described in the CEMP).

The specific maintenance and monitoring undertaken for each device, and the frequency, is provided in Table 8.3 below.

Table 8.3: Maintenance programme for erosion and sediment control devices

Device	Maintenance	Frequency
Diversion channels.	Inspect for blockages and clean out as necessary.	After each rainfall event.
	Inspect its general condition, repairing as necessary.	Every two weeks.
Site exit points, access roads, and hard stand areas.	Sweep to remove debris.	At the end of each day.
	Inspect any structure used to trap sediment and clean out as necessary.	After each rainfall event.
	Inspect its general condition, repairing as necessary.	Every two weeks.
Sediment fences	Inspect for defects, such as collapse and Ineffectiveness.	Every two weeks and after each rainfall event.
	Remove sediment deposits when bulges occur or when sediment accumulation reaches half way up the fabric height.	As necessary, based on inspection.
Filter socks	Inspect for clogging.	Daily.
	Remove accumulated sediment and debris and clean, or replace the sock.	As necessary, based on inspection.

8.3.2 Monitoring

The clarity of the water will be visually assessed as an indication of suspended sediment levels. In the event that suspended sediment is not at a level acceptable for discharge, the construction methodology will be reviewed and adjusted as necessary.

8.4 Contingency measures

8.4.1 Predicted heavy weather

A plan and check list of measures to be undertaken in advance of wet weather will be prepared and updated by the Contractor. The measures identified are summarised below:

- Sealing off of fill surface and covering stockpiles; and
- Checking of all erosion and sediment controls to ensure they are operational.

The Contractor will be required to monitor the weather, and in advance of any predicted rainfall event, ensure that all erosion and sediment control measures are in place and the wet weather measures are completed.

Similarly, if site works are to cease for a period of greater than 24 hours the Contractor will ensure the measures identified above are followed.

8.4.2 Contingency measures

In the event of natural hazards, extreme climatic events or human error the contingency actions identified in Table 8.4 below may need to be enacted.

Table 8.4: Contingency Measures

Cause	Effect	Contingency action
Human error	Failure of treatment device	Determine extent of loss of sediment, contain lost sediment with silt fences, direct water away from damaged/disturbed repair or replace treatment device.
Extreme rainfall event	Failure of silt fences	Repair or replace.

8.5 Review and update

The ESCP is a 'living' document and will be updated as required to reflect changes to works on site and improved knowledge and practices of erosion and sediment control.

The ESCP will be formally reviewed in response to a request from Tasman District Council or in response to a complaint or incident. This review will ensure that the matter is investigated adequately, and, if required, a programme will be in place to implement the changes. The ESCP would be updated to reflect the changes.

8.6 Site responsibilities

The responsibilities in regard to the preparation and implementation of the ESCP are shown in Table 8.5 below.

Table 8.5: Contingency Measures

Position	Name	Responsibilities	Contact details
Environmental and Compliance Manager	TBC	Erosion and sediment control design.	TBC
On Site Environmental and Compliance Delegate	TBC	Supervision of installation Weekly formal audits.	TBC
Site Supervisor	TBC	Installation and maintenance of sediment control measures. Daily inspections. Measures in advance of heavy rainfall.	TBC

9 Applicability

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

Tonkin & Taylor Ltd

Report reviewed by:

Authorised for Tonkin & Taylor Ltd by:

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Neville Laverack

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Mark Foley

Senior Water Engineer

Project Director

EMCF

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Appendix A: Resource Consent Conditions

- To be provided post granting of consent

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Appendix B: Inspection Checklist

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Environmental Site Inspection Check list

Compliance with measures outlined in CEMP and ESCP	Pump station works	Bartlett Creek Crossing	Ellis Creek Crossing	Pipeline trenching/works along the pipeline alignment	Comments
Silt fences- ensure well bedded, not flapping or ripped					
Filter sock – ensure not undercut or ruptured					
Collection drains – ensure clean of debris or litter					
Diversion drains – ensure that in a condition to effectively divert water					
Storm water grills – ensure grill are clear with no accumulation of litter or sediment					
Spill kits – in response sheds ready for use					
Litter/ rubbish – site clean and tidy					
Material that is a potential dust nuisance					
Hazardous materials storage					
Hazardous material outside storage area					
Areas requiring additional measures e.g. new dump areas					
Machinery condition- excessive noise, exhaust emissions, dripping oil					
Actions	Description	By whom		By when	
Previous actions not completed					
No	Date			Action	
Inspection by					
Date					
Weather conditions					
Signed					

