

Canterbury Regional Code of Practice

for defences against water and drainage schemes

Date: April 2019



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1 INTRODUCTION

This Code of Practice sets out standards and guidelines for undertaking works within the riverbed to install, maintain, use or remove defences against water and for drainage network maintenance activities. It is intended to be used by local authorities and network utility operators which undertake works on flood protection assets and defences against water within the Canterbury region.

The proposed Canterbury Land & Water Regional Plan, Rule 5.138, provides for the installation, maintenance, use and removal of defences against water as a permitted activity subject to a number of conditions. One of these conditions is that the work is undertaken by, or on behalf of, a local authority or network utility operator in accordance with a plan that has been certified by Environment Canterbury as being in accordance with this Code of Practice.

Local authorities and network utilities operate a range of assets which are located within or adjacent to the riverbed. This includes flood protection assets such as stopbanks, groynes, rock protection, and berm planting, as well as essential infrastructure assets that require protection from flood waters to maintain functionality (for example, intake structures, bridge or power

pylon foundations, and roads). Installation, maintenance, use, or removal of these works has the potential to cause adverse environmental effects if it is not managed and undertaken appropriately. This Code of Practice sets out the way these works can be undertaken in a way that avoids, remedies or mitigates potential adverse environmental effects.

Certification of work plans as being in accordance with the Code of Practice is only one condition required to be satisfied to undertake works as a permitted activity. All conditions of Rule 5.138 must be satisfied to undertake works as a permitted activity. If these conditions cannot be satisfied, resource consent may be required.

Similarly, other rules in the Land and Water Regional Plan and District or City Council rules may also apply to the activities.

In addition, approvals under the Flood Protection and Drainage Bylaw 2013 may be required for any works within the vicinity of flood protection and flood control works owned or controlled by Environment Canterbury, where those activities have the potential to adversely affect the integrity or effective operation and maintenance of the works. More information on the Bylaw can be found at www.ecan.govt.nz/floodbylaw.

1.1 Works covered by this Code of Practice

The works covered by this Code of Practice are those within the beds of lakes and rivers where they are undertaken for the purpose of installing, maintaining, using or removing defences against water and to undertake maintenance activities for drainage schemes where the work is undertaken by, or on behalf of, a local authority or network utility operator.

For the purposes of this Code of Practice:

- **“River”** has the meaning defined in the Resource Management Act 1991: “A continually or intermittently flowing body of freshwater; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal).”
- **“Installation”** means any works required to maintain the functionality and design performance standard of an asset or scheme defined as a defence against water. It does not include installation of new capital works to create a new flood protection scheme, or the installation or improving of an existing asset to a higher performance standard. However, new physical works may be installed where there is no change in the scheme’s designed level of service or functionality (for example, addition of a groyne to protect existing assets and maintain level of service). See also the definition of “Maintenance” below, particularly in respect of upgrade works.
- **“Maintenance”** has the meaning defined in the proposed Canterbury Land & Water Regional Plan: “Repairing and keeping a structure, land or vegetation in good and safe condition and includes upgrading and minor alterations as long as any upgrading or minor alteration does not materially increase the footprint, height or external envelope of the structure.” Upgrades to existing assets can occur under this Code of Practice where there is no increase in the design performance standard of the scheme. For example, stopbank upgrades such as buttressing or slope correction do not increase the level of protection (design height and design flood

event or return period), but do improve the likely performance of the stopbank in an under-design or design flood event. Similarly, stopbank heights may be increased where they currently do not meet the scheme design height (which may occur, for example by degradation at vehicle crossing points, riverbed aggradation or foundation settlement).

- A material increase in the footprint, height or external envelope of the structure would be one which has a more than minor effect on flood carrying capacity or river geomorphology does not meet the definition of maintenance in the proposed Land & Water Regional Plan (that Plan allows for some change to the footprint, height or external envelope of the structure).
- **“Defence against water”** has the meaning defined in the proposed Land & Water Regional Plan: “Any structure or equipment, including any bund, weir, spillway, floodgate, bank, stopbank, retaining wall, rock or erosion protection structure, groyne, vegetation (including anchored tree protection) or reservoir, that is designed to have the effect of stopping, diverting, controlling, restricting or otherwise regulating the flow, energy or spread of water, including floodwaters, in or out of a waterbody, artificial watercourse, or artificial lake. For the purpose of this definition, dams are excluded.”

This Code of Practice only applies to works undertaken **within the bed of a river or lake**. This has the meaning defined in the proposed Land & Water Regional Plan:

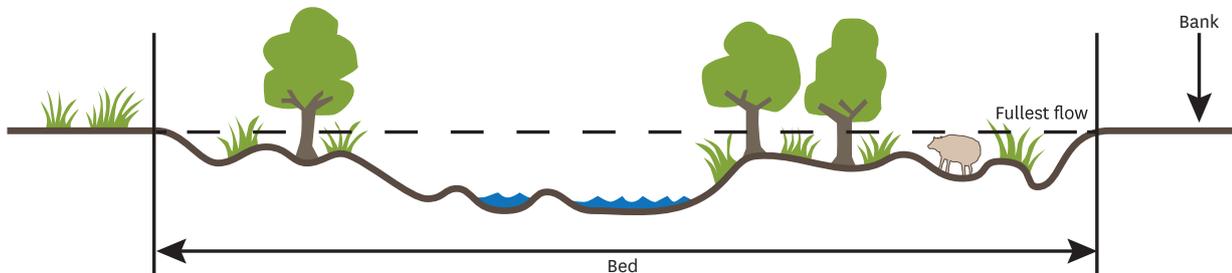
- **“Bed”** means the space of land extending between the outward extremities of any stopbank or any flood protection vegetation, as shown on the maps which form part of the CRC Flood Protection and Drainage Bylaw 2013, and where there is no stopbank or flood protection vegetation or relevant map in the CRC Flood Protection and Drainage Bylaw 2013, means:
 - (a) in relation to any river–
 - (i) ...;
 - (ii) ..., the space of land which the waters of the river cover

- at its fullest flow without overtopping its banks; and
- (b) in relation to any lake, except a lake controlled by artificial means,–
 - (i) ...;
 - (ii) in all other cases, the space of land which the waters of the lake cover at its highest level without exceeding its margin; and

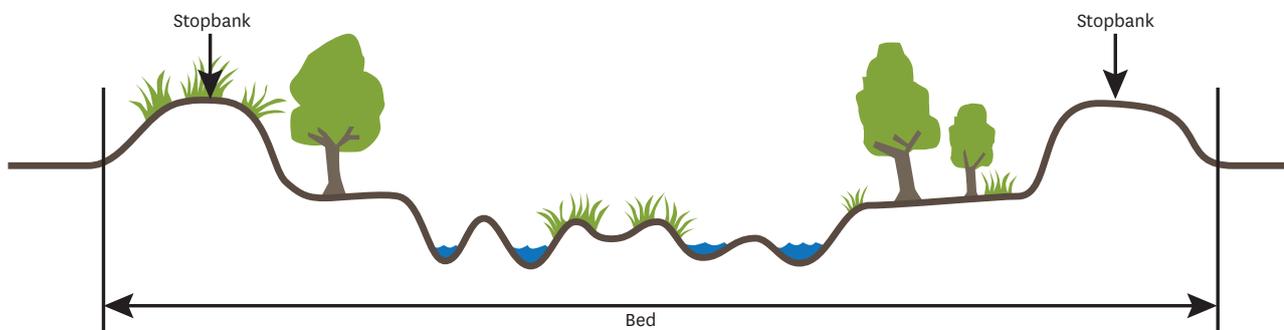
(c) in relation to any lake controlled by artificial means, the space of land which the waters of the lake cover at its maximum permitted operating level.”

Note: Should this definition in the Land and Water Regional Plan change, then the definition for bed should be read as what is stated in the current version of the Plan. The area defined as the bed of a river is summarised in the following diagrams:

Riverbed definition: Rivers without stopbanks



Riverbed definition: Rivers with stopbanks



1.2 Structure of Code of Practice

This Code of Practice is set out in four sections:

- **Section 1** provides background information as to its purpose and how it is to be used. Users should review Section 1 to determine whether the Code is relevant to their proposed works and make sure those works are not excluded from consideration under the Code.
- **Section 2** sets out general requirements which must be met for all activities to be undertaken under the Code. The requirements in Section 2 are specified for all activities.
- **Section 3** provides guidance on requirements for a range of activities that may be undertaken in the installation, maintenance, use and removal of defences against water. Users should:
 - Check whether the proposed activity is listed in *Table 3* on page 17 (refer also to the relevant activity description in Section 3.1 for detail)
 - If the proposed activity is listed in *Table 3*, identify the relevant requirements for that activity as set out
 - Refer to the relevant requirements and develop a work plan including them
 - If the proposed activity is not listed in *Table 3*, but does fall within the definition of “installation, maintenance, use and removal of defences against water”, consider the potential environmental effects of the activity and determine measures required to address them.

- **Section 4** provides details of the process for gaining certification of work plans. Users are encouraged to submit annual work plans, standard work instructions or operational and maintenance plans where those documents adequately address relevant requirements set out in this Code. Where such documentation is provided, and sufficiently meets the criteria, Environment Canterbury will issue certification for works to be undertaken for up to three years.

1.3 Legislative context

This Code of Practice has been developed to enable local authorities and network utility operators to undertake works to install, maintain, use and remove defences against water and drainage schemes. Works under this Code may be undertaken by the local authority or network utility operators themselves, or by third parties (such as contractors) where they are working on behalf of a local authority or network utility operator.

The primary types of work to be undertaken under this Code are flood protection works carried out by Environment Canterbury and other local authorities within the Canterbury region as part of their statutory responsibilities for providing defences against water and drainage. In addition, works to defend from water other infrastructure within the bed of a river or lake may also be undertaken under this Code.

Statutory responsibilities for provision of defences against water

Under the Soil Conservation and Rivers Control Act 1941, Environment Canterbury has a statutory function to minimise and

prevent damage by floods and erosion. It also has powers under that Act to maintain and improve defences against water.

In some areas, local authorities also provide local drainage and flood protection measures under the Soil Conservation and Rivers Control Act 1941 and the Land Drainage Act 1908. In addition, all infrastructure provided by local authorities is subject to the provisions of the Local Government Act 2002 which, among other things, requires the Council to provide “good quality infrastructure” which is “efficient, effective and appropriate to present and anticipated future circumstances”.

Works undertaken by network utility operators

“**Network utility operator**” is defined in section 166 of the Resource Management Act 1991 and includes persons or organisations which undertake and provide a range of network utilities including, but not limited to, energy transmission and pipelines; telecommunications and radio communications; electricity distribution; water distribution including irrigation; drainage or sewerage systems; and transportation. Users seeking to undertake works under this Code of Practice as a network utility operator should refer to section 166 of the Resource Management Act to confirm that they meet the criteria.

The functioning of networks sometimes requires assets to be located within the riverbed and such assets may require defences against water to maintain their functionality. Depending on the network utility and organisation, a range of statutory powers and/or functions may apply.

Resource Management Act

Functions undertaken under all of the above statutes are subject to the provisions of the Resource Management Act. The purpose of that Act is to “promote the sustainable management of natural and physical resources”.

Section 13(1) states:

“No person may, in relation to the bed of any lake or river, –

- (a) Use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed; or
- (b) excavate, drill, tunnel, or otherwise disturb the bed; or
- (c) introduce or plant any plant or any part of any plant (whether exotic or indigenous) in, on, or under the bed; or
- (d) deposit any substance in, on, or under the bed; or
- (e) reclaim or drain the bed –

unless expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.”

There is no national environmental standard relevant to the installation, maintenance, use or removal of defences against water.

The proposed Canterbury Land & Water Regional Plan contains a rule which provides for the installation, maintenance, use and removal of defences against water as a permitted activity.

This Code of Practice has been developed to detail how defences against water can be installed, maintained, used and removed in a way which avoids, remedies and mitigates potential adverse environmental effects so that it is appropriate for these works to be undertaken as a permitted activity under this regional rule.

While this Code of Practice has been written to help with compliance with regional rules for associated activities for works in river and lake beds, it is the responsibility of those working in accordance with this Code to make sure they comply with the regional rules for associated activities (for example, refuelling, storage of hazardous substances and discharges to air). The certification process outlined in Section 4 states that work plans are in accordance with this Code; it does not include certification that work complies with all relevant rules.

In developing this Code of Practice, the relevant Objectives and Policies of the proposed Land & Water Regional Plan have been considered – see that proposed Plan for a list of Objectives and Policies.

Canterbury Water Management Strategy

The Canterbury Water Management Strategy vision:

“To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework”

The 10-year goals in the Strategy which are relevant to this Code of Practice include:

- Ecosystems, habitats and landscapes will be protected and progressively restored, and indigenous biodiversity will show significant improvement
- Water quality will be protected and starting to return to within healthy limits for human health and ecosystems
- Opportunities to exercise kaitiakitanga and rangitiratanga will be operative, and increasing
- Opportunities for recreational activities will be returning and improving.

To achieve the vision of the Canterbury Water Management Strategy, targets have been developed which set goals to measure progress over time. The targets relevant to this Code are for:

- Ecosystem health and biodiversity
- Natural character of braided rivers
- Kaitiakitanga
- Recreational and amenity opportunities

Specific catchment notes

If working within the Pareora catchment, any diversion of water to maintain, repair or replace existing infrastructure may be subject to rules in the Pareora Catchment Environmental Flow and Water Allocation Regional Plan.

If working within the Waipara catchment, any taking, diversion or use of water to maintain, repair or replace existing infrastructure may be subject to rules in the Waipara Catchment Environmental Flow and Water Allocation Regional Plan.

If works are undertaken within the Waimakariri River, the tributaries of the Waimakariri River upstream of the Waimakariri Gorge Bridge or in the Eyre River, refer to the Waimakariri River Regional Plan to make sure the activity complies with the requirements of this plan.

Catchment-specific plans will be replaced by sub-regional sections of the Land & Water Regional Plan as they are developed. Refer to the Environment Canterbury website to determine the current planning framework for your area. In addition to the region-wide rules in the Land & Water Regional Plan, additional

rules may be introduced by the sub-regional sections of the Land & Water Regional Plan. Check the relevant sub-regional section to determine whether there are any additional requirements.

1.4 Objectives and principles

This Code of Practice has been developed to give effect to the objectives and policies of the proposed Land & Water Regional Plan. It enables local authorities and network utility operators to undertake works associated with defences against water and drainage scheme maintenance in an efficient and effective manner, while at the same time avoiding, remedying or mitigating potential adverse environmental effects.

The objective of the Code of Practice is therefore:

To avoid, remedy or mitigate any adverse effects on the environment associated with the installation, maintenance, use and removal of defences against water and drainage scheme maintenance while enabling the efficient and effective operation, ongoing maintenance, repair, development and upgrading of infrastructure.

The Code has been developed on the following principles:

- Instream environmental and ecological values (such as native and sports fish and their habitat) shall be identified and appropriate measures put in place to avoid, remedy or mitigate adverse effects including minimising instream works, avoiding sediment deposition, and avoiding or mitigating effects on fish passage
- Flood protection works do not adversely impact on berm and riparian values wherever possible. This includes avoiding native vegetation and the habitats of indigenous species
- Environmental enhancement opportunities (such as restoring or enhancing fish passage or carrying out native planting) shall be considered and, where funding and site conditions allow, incorporated into the work
- Cultural matters shall be investigated, sites of significance identified, and appropriate construction and accidental discovery procedures adopted to avoid, remedy or mitigate adverse effects. This should occur through engagement with tangata whenua to identify issues and determine appropriate measures
- Waterway and riparian amenity and recreational values shall be maintained
- Waterways shall not be narrowed, restricted, or realigned to a degree that reduces flood capacity, increases erosion risk, or destabilises river alignment
- Riverbed elevation change shall be neutral or conform with design bed level requirements, if available – areas of cut and fill are acceptable provided the overall elevation change is either neutral or trending towards target bed level elevations. Target bed levels, if relevant, can be obtained from the Environment Canterbury river engineering team
- Existing flood and erosion protection infrastructure shall not be weakened
- Performance of other infrastructure such as bridges, water intakes and power pylons shall not be adversely affected
- New flood protection infrastructure shall be maintained on an ongoing basis by the local authority or network utility operator
- Location, timing, duration and scale of works shall be considered

- The effects of flood protection work on Significant Natural Areas (SNA) are minimised and steps are taken to maintain or enhance these areas where practicable. Note: SNA are defined in district plans, refer to the district plan in your area to determine if works will be carried out within a SNA.

1.5 Potential effects to be managed

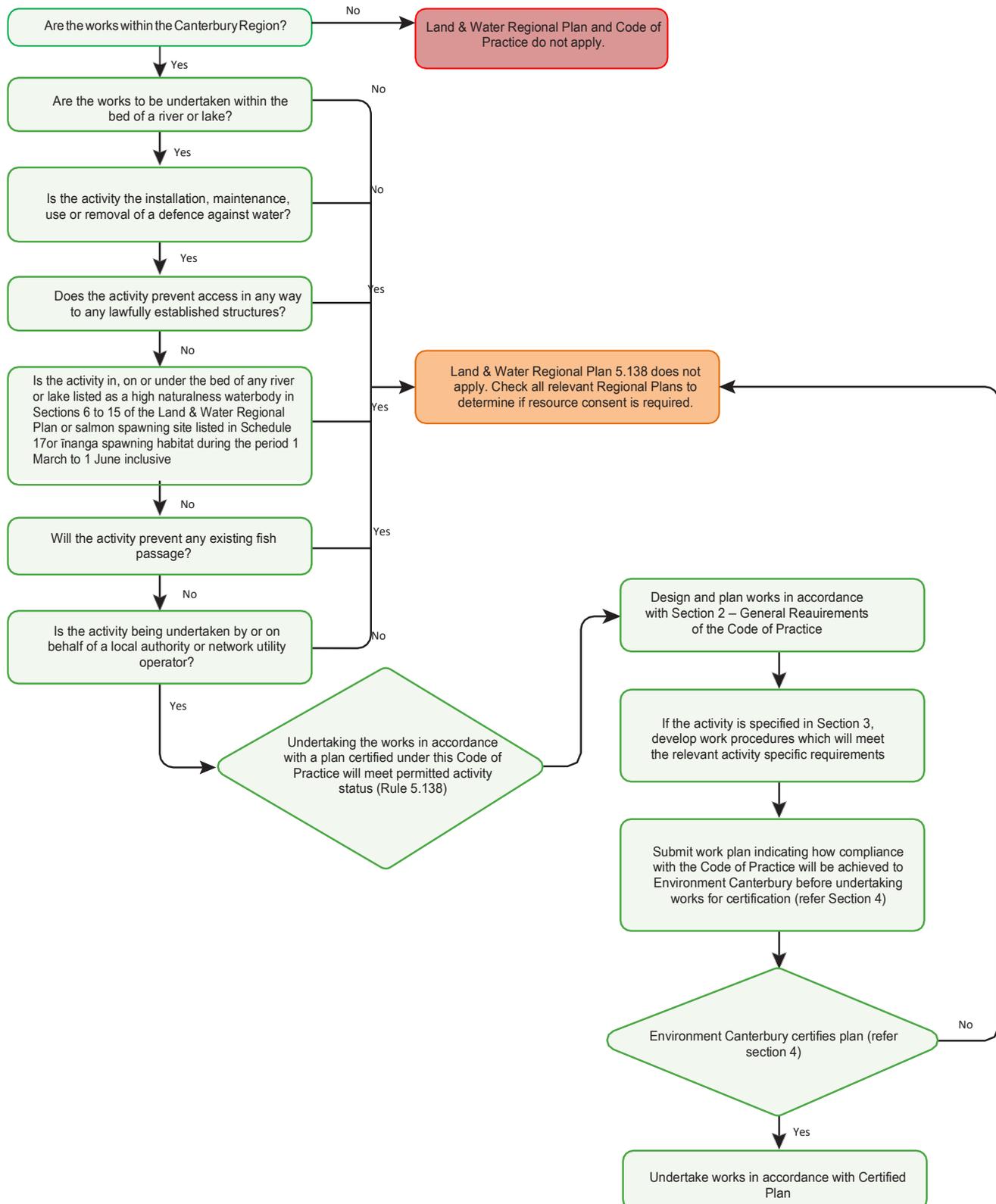
Potential effects on the environment associated with works detailed in this Code of Practice generally fall within the categories set out in Table 1 (see section 3.1 for full descriptions of possible adverse effects). There are both potential adverse and potential beneficial effects of undertaking activities detailed in this Code. The procedures set out in Sections 2 and 3 of the Code are designed to avoid, remedy or mitigate potential adverse effects as far as practicable, while at the same time maximising potential beneficial effects.

Table 1: Potential Environmental Effects

Effects type	Potential adverse effect	Potential beneficial
Effects on flooding and erosion	<ul style="list-style-type: none"> • Reduced flood-carrying capacity • Cause areas of erosion • Threaten existing flood-protection works or other structures • Increased flooding of developed land adjacent to watercourses 	<ul style="list-style-type: none"> • Enhancement of flood-carrying capacity • Stabilise areas of potential river bank erosion • Enhance and protect existing flood protection works or other structures • Reduced flooding of developed land adjacent to watercourse
Effects on riverbed plants and animals	<ul style="list-style-type: none"> • Spread of introduced exotic species • Removal of fish and large invertebrates (e.g. koura, kākahi) • Negative impact on water quality • Destruction or reduced quality of habitat • Loss of natural character of rivers • Loss of ecosystem health • Impede fish passage • Reduce fish abundance • Disturb nesting and rearing sites • Interrupt fish spawning or migrations 	<ul style="list-style-type: none"> • Positive impact on water quality • Potential to create or enhance quality of habitat through appropriate planning of works • Create open gravels for native bird nesting habitat • Remove habitat for mammalian predators • Remove pest plant species and minimise weedspread
Effects on Significant Natural Areas	<ul style="list-style-type: none"> • Destruction or reduced quality of habitat • Removal of indigenous vegetation • Loss of biodiversity • Disturb nesting, rearing or roosting sites 	<ul style="list-style-type: none"> • Potential to create or enhance quality of habitat • Removal of pest plant species. • Increased protection of these areas from the effects of flooding and erosion
Effects on cultural values	<ul style="list-style-type: none"> • Reduced abundance of mahinga kai • Disturb culturally, historically or archaeologically significant areas 	<ul style="list-style-type: none"> • Enhancement of habitat quality • Protection of culturally, historically or archaeologically significant areas
Effects on amenity values	<ul style="list-style-type: none"> • Decline in amenity values • Visible dirty water • Unsightly vehicles and machinery • Odour from spraying, machinery fumes, and weed decomposition • Noise of machinery 	<ul style="list-style-type: none"> • Potential for enhanced recreational opportunities (e.g. via regional parks) • Access ways and tracks within river berms created for recreation
Effects on people and communities	<ul style="list-style-type: none"> • Reduced quality of recreational opportunities • Disruption to recreation areas • Impacts on structures, including bridges, gauging sites and intakes 	<ul style="list-style-type: none"> • Provide flood protection • Enhanced public access • Economic benefits (e.g. allowing land to be used for productive purposes)

1.6 User guide

The following diagram sets out the process for deciding whether works on defences against water are able to be undertaken as a permitted activity under the Land & Water Regional Plan. This diagram does not include works to maintain drainage schemes, as not all of those activities are not covered by rule 5.138 of the Land & Water Regional Plan but are included in this Code for operational purposes.



1.7 Exclusions

This Code of Practice is concerned only with **how and when** activities are undertaken within the beds of rivers and lakes to help in compliance with permitted activity provisions under the Land & Water Regional Plan.

The Code does **not** cover any of the following matters and certification of work plans under this Code does not provide approval of any of the following:

- a) **Design or performance standards and guidelines** – the Code does not provide guidance on what activities should take place or to what standard in order to achieve any specific performance standard for defences against water. Works falling within this Code relate to the installation, maintenance, use and removal of defences against water to maintain scheme functionality or asset performance. It is the asset owner’s responsibility to determine the level of maintenance or other works required to maintain scheme functionality and performance
- b) **Health and safety requirements** – it is the responsibility of the local authority or network utility operator undertaking the work to meet all requirements of the Health and Safety at Work Act 2015 and any relevant regulations and approved Codes of Practice
- c) **Site access arrangements** – certification of work plans under this Code does not provide the local authority or network utility operator with legal access to any sites. The local authority or network utility operator must arrange all necessary legal access to sites to undertake the proposed works
- d) Any other **statutory approvals** which may be required to complete the works, including but not limited to district plan requirements which may include requirements for works in Significant Natural Areas
- e) This Code of Practice does not cover activities undertaken in the coastal marine area and gravel extraction activities

To facilitate gravel extraction for flooding and erosion hazard control purposes, Environment Canterbury has developed the River Gravel Extraction Code of Practice. This Code enables the extraction of gravel as a permitted activity. For more information about how gravel can be extracted under the Code, go to www.ecan.govt.nz/gravel

2 GENERAL REQUIREMENTS

This section of the Code of Practice details requirements which apply to any works associated with the installation, maintenance, use and removal of defences against water and drainage scheme maintenance activities covered by the Code. Irrespective of the specific work type or activity, the general requirements must be met. Section 2 and 3 of the Code of Practice set out **what** must be achieved, work plans must set out **how** these requirements will be achieved.

2.1 Planning the works

One of the most effective methods of avoiding and minimising potential environmental effects for works in the bed of rivers or lakes is to undertake effective planning. This involves:

- Planning to undertake the work **at a time when the potential effects can be minimised**. Consideration should be given to:
 - Avoiding sensitive spawning and migration times with consideration of the locations of native and sports fish (refer to Section 2.3 for details regarding sensitive times)
 - The nesting season and location of native birds
 - Where works are within recreational areas, avoiding times of high recreational use (public holidays, weekends, times of specific events). Working on Saturdays is not precluded but consideration should be given to effects on recreational users
 - Long-range weather forecasts and whether conditions (weather and flow) are likely to be favourable for the duration of the works
- Planning to undertake the work **as quickly as practical** in order to minimise the length of time that potential adverse effects may occur. Consideration should be given to:
 - Ensuring materials, equipment and machinery are available before starting
 - Making sure that once works start, they can proceed uninterrupted
- Planning to undertake the work in a way that **minimises the area to be disturbed**. Consideration should be given to:
 - Whether there are any areas of significant indigenous vegetation or significant habitats of indigenous fauna¹
 - Can the site be accessed by an existing track or does a new track need to be created?
 - The extent of the area that needs to be worked
 - Whether the work can be undertaken outside flowing water
- **Planning for the unexpected**. Consideration should be given to what will need to happen:
 - In the event of unfavourable weather or flow conditions
 - If there is a spill on site
 - If archaeological discoveries are made

¹ Note that areas identified within district plans (such as Significant Natural Areas) do not cover all areas of significant values. Appendix 3 of the Canterbury Regional Policy Statement provides guidelines for determining the ecological significance of any area and these are available online at www.ecan.govt.nz.

- **Consideration for the wider environment:**

- Have conditions changed since the defence against water or drainage scheme was originally constructed, such as new habitats developed in the wider environment?
- Have there been improvements in technique and technology which could be used rather than working to status quo?
- Does the activity impact on habitats surrounding the main works area, including downstream habitats and in areas such as wetlands or springs which may be present in the areas surrounding rivers or lakes?

Detail to help in planning are provided in section 2.3 of this Code of Practice.

2.2 Engagement and notifications

Users are encouraged to engage with tangata whenua, Fish & Game, the Department of Conservation and local authorities where works are likely to be undertaken in culturally or environmentally significant areas (including Significant Natural Areas). Detail of the consultation undertaken should be included in works plans. If Environment Canterbury considers that consultation is necessary, then this may be required before certification will be given.

Statutory Acknowledgement, Silent Files and Rūnanga Sensitive areas

Persons intending to undertake works as a permitted activity in accordance with this Code of Practice are required to confirm whether the worksite areas are within Silent File or Statutory Acknowledgment areas as identified in the Ngāi Tahu Claims Settlement Act 1998. These areas can be checked as follows:

- Statutory Acknowledgement areas in the Canterbury region are listed in Schedule 19 of the Land & Water Regional Plan. They are also mapped on the Canterbury Maps tool available at www.canterburymaps.govt.nz
- Silent File areas can be checked using the Canterbury Maps tool
- Other sensitive areas, as identified on Canterbury Maps under “Rūnanga Sensitive Areas (Ngai Tahu)”

The Statutory Acknowledgement and Silent File areas are not default layers on the Canterbury Maps tool. These layers need to be added to the individual user’s viewer in order to become visible. Refer to the help guide on www.canterburymaps.govt.nz under “Adding other Canterbury Map’s Layer”.

Where works are to occur in a Statutory Acknowledgement or Silent File area, or Rūnanga Sensitive area, the Papatipu Rūnanga is to be notified of the intention to carry out the works and the intended type and scope of works, not less than 10 working days before commencement, to enable the Rūnanga to advise of any matters that need to be addressed before carrying out the work.

Works shall not interfere with any sites of significance identified by Papatipu Rūnanga unless expressly agreed with them.

Absence of a Statutory Acknowledgement, Silent File, or Rūnanga Sensitive area does not necessarily mean that a proposed worksite does not have cultural values or is not significant to the Papatipu Rūnanga. Users are encouraged to engage with Papatipu Rūnanga regarding their work programme to identify any areas of significance and agree appropriate measures to avoid, remedy or mitigate any effects, and “accidental discovery” protocols must be in place. This consultation may be identified as a requirement before certification of a work plan can be obtained in areas where Environment Canterbury consider it is necessary for prior engagement with tangata whenua to occur.

Significant Natural Areas

Where a local authority has mapped areas of a river bed as a “Significant Natural Area”, prior to any clearance of indigenous vegetation within these Significant Natural Areas, the relevant local authority will also be given advance notification of these works occurring. The local authority, depending on the provisions in its district plan, may need to give approval prior to works in Significant Natural Areas occurring. This may mean that a resource consent is obtained from the local authority. Except in the case of an emergency, any advance notice of work must be given five working days prior to work starting.

Additional engagement to be undertaken by Environment Canterbury

In addition to the above, Environment Canterbury shall invite Papatipu Rūnanga, the Department of Conservation, Fish & Game and Environment Canterbury environmental science and hazards team on an annual basis to discuss and review their annual works programme including, but not necessarily limited to:

- Sites of anticipated significant bed disturbance
- Channel realignment works
- Spraying operations
- Areas of vegetation disturbance or clearance
- The proposed location, duration and timing of these works

The purpose of these discussions will be to inform these stakeholders of proposed works and to agree, where necessary, appropriate methods of reinstating cultural and ecological values where they may be affected. A discussion of the effectiveness of the Code of Practice and of any work plans that Environment Canterbury has certified during the previous 12 months will also be part of the agenda.

Where required (for example, works in flowing water during trout or salmon spawning seasons, and in Rūnanga Sensitive areas) Environment Canterbury will notify the local Rūnanga, Department of Conservation and Fish & Game before works are undertaken. Such notification will generally occur five working days before works start.

2.3 Work practices

This section sets out the work practices required to be followed for all activities undertaken in accordance with this Code of Practice.

In considering these general requirements, as well as the activity-specific requirements set out in Section 3, users should be mindful of the overall objectives and principles set out in Section 1. Some requirements are subject to practicability and, in certain circumstances, the environmental effects of following the requirements may be greater than using alternate methodologies. The following factors will be taken into account when deciding whether complying with the requirements of the Code is practicable:

- Increased environmental impacts – the methodology proposed in the Code may increase the environmental impact of the activity in certain locations (for example, bunding around an activity may release more sediment than undertaking the activity itself)
- Weather conditions – adverse conditions may compromise the mitigation methodology (such as revegetation).
- Safety constraints – the site may have particular constraints that will require an alternative methodology in order to be able to work in a safe manner
- Emergency works – departures from standard procedure may be required to address emergency situations.

Alternative methodologies should be discussed with Environment Canterbury before submitting workplans for certification.

2.3.1 Worksite design, layout and establishment

- Prior to establishing on site, identify the existing values on site such as areas of native vegetation and areas of native species habitat.
- All works shall be planned, scheduled and designed to take account of the following requirements:
 - The natural character of the river, which includes impacts on natural river processes and habitat development.
 - The likelihood of suitable weather and river flow conditions
 - The spawning and migration seasons and locations of salmon, trout and native fish. Refer to “General Requirements: Timing of Works” for details
 - The nesting season of native birds. Refer to “General Requirements: Timing of Works” for details
 - Recreational interests and amenity (including contact recreation)
 - The nesting, rearing and feeding habitat of gamebirds and associated recreational hunting areas
 - Activities on adjoining properties
 - Access to the worksite
 - Safety on and around the site
 - The impact of traffic, dust and noise on the environment
 - The location of key mahinga kai sites
 - The presence of native fauna and flora and key habitat for species such as lizards and bats

- The potential for fire risk
- Effects of hydraulic changes resulting from the work (such as weed cutting or diversions)
- Where possible, works should avoid areas of cultural or heritage significance
- If the work involves tree disturbance in the long-tailed bat habitat area, the Department of Conservation is first consulted to determine if trees to be damaged or removed are known, or possible, roost trees. Locate the habitat area on Canterbury Maps
- The layout of each worksite shall be determined before the start of the work and shall be designed and formed to avoid potential environmental effects as far as practicable
- Where practicable, site work areas shall be accessed via existing tracks and existing stream crossings. Vegetation disturbance shall be kept to a minimum – see below
- Where practicable, the natural character of the river is to be preserved including by reinstating the site and carrying out enhancement work
- Works and structures shall not reduce flood-carrying capacity or cause erosion to the bed or banks
- Works shall be planned to be undertaken outside the area of flowing water. Where this is unavoidable, all measures shall be taken to minimise bed disturbance and release of sediment
- Crossing of the active flowing channel shall be kept to a practical minimum, so that any potential sediment disturbance and impacts on instream habitats will be minimised. For example, use only one crossing point typically upstream of riffles, sediment control or minimisation measures
- The work site set up and the works must not prevent fish passage
- Provide appropriate signage or other controls when the worksite is in areas open for public access
- Risk management measures shall be in place to minimise the potential for damage arising from inclement weather and/or elevated river levels during the carrying out of the work
- Risk management measures shall be in place to minimise the potential for the works to start a fire

Advice Note: River flow conditions can be checked on Environment Canterbury’s website. Refer to www.ecan.govt.nz for further information.

Commentary

Particularly when working in remote areas, access to the worksite can be a significant cause of potential environmental effects of undertaking works. Wherever possible, access should be planned to occur via existing access tracks, even though these may not necessarily be the most direct route to the worksite. Any vegetation disturbance to access the site should be kept to the minimum practicable and shall be determined taking into account not only the extent of area disturbed but also the type of species and their ecological value. Reinstatement works should restore disturbed vegetation as far as possible. Disturbance of any vegetation that provides a flood protection or attenuation purpose requires prior written approval of the authority responsible for the flood protection scheme (typically Environment Canterbury).

Where there is public access through a worksite, design of the site and access should take into account how public access can be managed around the worksite and / or alternative access can be provided. The need to provide alternative access will need to take

into account the duration of the works proposed, the frequency of use by the public and whether it is safe and practicable to provide alternative access. If access is to be disrupted, consultation should be carried out with the agency responsible for managing the area.

Before undertaking works, it is recommended that the site is checked for any historic or culturally significant areas. This can be undertaken by reference to district plans, search of the Heritage New Zealand register and consultation with iwi groups.

It should also be determined if the work is to occur within a Significant Natural Area, these areas are also found in district plans. Separate requirements may be imposed by the District Council for works in these areas.

The site should also be checked to identify whether the work area is likely to contain any threatened fish, plant and animal species. This can be done by consulting the Department of Conservation Threat Classification System/Conservation status at: www.doc.govt.nz/nature/conservation-status/ and the New Zealand Freshwater Fish Database (for fish only). Particular care should be taken to avoid any effects on threatened flora and fauna and their habitat.

2.3.2 Timing of works

All works shall be timed to minimise the potential for adverse environmental effects arising from the proposed works. This shall include:

- All practicable measures shall be undertaken to minimise adverse effect on amenity values. This includes:
 - No work (other than emergency works or works required for safety or infrastructure operational requirements such as for works required on the rail network) shall be carried out on Sundays or public holidays
 - Works shall only occur between the hours of 7am and 7pm, except in the case of an emergency or if necessary for safety or infrastructure operational requirements
 - Public access shall not be prevented for longer than is necessary to undertake the works safely
- If works undertaken in braided rivers involving disturbance of the riverbed are to be carried out between 1 September and 1 February, the following shall be undertaken to prevent any disturbance of nesting birds:
 - A suitably qualified person shall inspect the proposed area of works no earlier than eight days before the works are carried out and shall locate any nesting or chick rearing sites of birds listed as 'Threatened – Nationally Critical, Nationally Vulnerable or Nationally Endangered' or 'At Risk' under the New Zealand Threat Classification System. A copy of the current threat classification series can be found on the Department of Conservation website as described above
 - The person carrying out the inspection shall prepare a report or site plan that identifies all the located bird breeding or nesting sites
 - Any person carrying out works within the riverbed are to be informed of any nesting or chick rearing sites. No vehicle or machinery shall operate within 100 metres of any nesting or breeding bird sites unless alternative distances are recommended as acceptable in the inspection report.
 - Where work ceases for more than eight days, the site is to be re-inspected for bird nesting sites and chick rearing in

accordance with the above procedure

- If works are disrupted by a major flood event (eg a bank to bank flood event) and works do not resume within eight days of the resumption of normal river flows, the site will be re-surveyed in accordance with the above procedure.
- Where works are not in braided rivers (such as in the drainage networks or single thread channels), but involve disturbance of the bed or clearance of trees between 1 September and 1 February, the person undertaking the works shall check the waterway banks and riparian vegetation, including the area 100 metres upstream and 100 metres downstream of the site, for any nesting or breeding birds listed as 'Threatened – Nationally Critical, Nationally Vulnerable or Nationally Endangered' or 'At Risk' under the New Zealand Threat Classification System, before starting the work. If nesting or breeding birds listed as 'Threatened – Nationally Critical, Nationally Vulnerable or Nationally Endangered' or 'At Risk' are identified, works shall be planned to ensure that no vehicle or machinery operates within 100 metres of any identified nesting or breeding birds.
- No work in inanga, salmon or trout spawning habitat may be carried out during spawning seasons without separate resource consent. Any works in spawning sites listed in Schedule 17 and on the planning maps of the Land & Water Regional Plan is outside Permitted Activity Rule 5.138. For inanga, the spawning season is 1 March to 1 June (inclusive). For salmon, it is April to August (inclusive) and for trout the spawning season is May to November (inclusive).

Note: Consent may also be required for any works within habitat areas of other native species as provided for in the Land & Water Regional Plan.

- Where practicable, works in the active riverbed or any associated lagoon or drainage habitat shall not be carried out during the opening weekend of duck shooting season (the first weekend in May) and angling season (Note: High Country rivers open the first Saturday in November with remaining rivers and lakes opening 1 October. Check the local Fish and Game website to confirm specific dates for target rivers) in any given year.

2.3.3 Accidental discovery protocol

This procedure relates to the accidental discovery of archaeological material. It does not replace the requirement to undertake reasonable investigation before starting works to make sure known archaeological sites are not affected by proposed works.

Any disturbance of archaeological material is subject to the provisions of the Heritage New Zealand Pouhere Taonga Act 2014.

Local authorities and network utility operators working under this Code of Practice shall ensure they are able to comply with the provisions of the Heritage New Zealand *Pouhere Taonga* Act 2014.

1. In the event of any discovery of archaeological material the operator shall immediately:
 - a) Cease work and mark off the affected area
 - b) Advise Environment Canterbury of the disturbance
 - c) Advise Heritage New Zealand *Pouhere Taonga* of the disturbance
2. If the archaeological material is determined to be *koiwi tangata* (human bones) or *taonga* (treasured artefacts) by Heritage New Zealand *Pouhere Taonga*, the person undertaking the works shall immediately advise the office of the appropriate rūnanga (office contact information can be

obtained from Environment Canterbury) of the discovery.

3. If the archaeological material is determined to be *koiwi tangata*, the authorisation holder shall immediately advise the New Zealand Police of the disturbance.
4. Work may recommence if Heritage New Zealand *Pouhere Taonga* (following consultation with *rūnanga* if the site is of Māori origin) provides a statement in writing to Environment Canterbury that appropriate action has been undertaken in relation to the archaeological material discovered. Environment Canterbury shall advise the person undertaking the works on written receipt from Heritage New Zealand *Pouhere Taonga* that work can recommence.

Note 1: This may be in addition to any agreements in place between the authorisation holder and the Papatipu Rūnanga (Cultural Site Accidental Discovery Protocol).

Note 2: Under the Heritage New Zealand *Pouhere Taonga* Act 2014, an archaeological site is defined as any place associated with pre-1900 human activity, where there is material evidence relating to the history of New Zealand. For sites solely of Māori origin, this evidence may be in the form of accumulations of shell, bone, charcoal or burnt stones. In later sites, artefacts such as bottles or broken glass, ceramics and metals may be found or evidence of old foundations, wells, drains, tailings, races or other structures. Human remains/*koiwi* may date to any historic period.

It is unlawful for any person to destroy, damage, or modify the whole or any part of an archaeological site without the prior authority of Heritage New Zealand *Pouhere Taonga*. This is the case regardless of the legal status of the land on which the site is located, whether the activity is permitted under the district or regional plan or whether a resource or building consent has been granted. The Heritage New Zealand *Pouhere Taonga* Act 2014 provides for substantial penalties for unauthorised damage or destruction.

2.3.4 Fuel and hazardous materials management

Note: Separate rules control refuelling and storage of hazardous substances in the bed of a river. Those operating under this Code of Practice shall ensure they can comply with the rules in the Land & Water Regional Plan or obtain a resource consent. The following requirements have been written to help compliance with the rules on refuelling and hazardous substances storage.

All works shall be carried out in a manner which avoids the potential for fuel and any other hazardous materials to enter the water. This includes:

- All practicable measures shall be undertaken to avoid the spillage of fuel or any other hazardous materials anywhere in the bed of a river or watercourse
- Fuel and hazardous materials shall not be stored within:
 - 20 metres of a surface water body or bore; or
 - A group or community drinking water protection zone as set out in Schedule 1 of the Land & Water Regional Plan
- The refuelling of machinery shall not take place over the wet bed of a river or lake, or in any area where spills may enter surface water
- All refuelling and bulk deliveries shall be directly supervised by the equipment operator
- All mobile plant shall be refuelled in a designated area, on an impermeable base, away from drains or watercourses. Where

this is not practicable, drip trays shall be used

- All non-mobile plant shall have drip trays or other spill containment measures installed
- Fuel shall be stored securely or removed from site overnight
- A written spill response plan shall be developed and communicated to all persons responsible for fuel storage and refuelling on site. A copy shall be kept on site at all times
- If a spill occurs, the following steps should be undertaken, in addition to any actions required under the site's spill response plan:
 - a) Be safe
 - b) Identify the spilt material
 - c) Put on the necessary personal protective equipment
 - d) Stop the source if you can to prevent the spill getting any worse or spreading
 - e) Try to soak as much of the spill up with appropriate absorbent material
 - f) If the spilt material has soaked into the ground, the area of the spill should be scooped up and removed off site and disposed of at a suitable disposal facility
 - g) Complete the spill response form and send it to Environment Canterbury
 - h) If the spill is more than 1 litre or has the potential to cause harm, contact the Incident Response Hotline immediately (0800 76 55 88).

The above requirements assume temporary worksites and that any fuel or hazardous substances stored are temporary measures in approved containers only. Establishment and use of permanent storage sites is not covered by this Code of Practice. Refer to the Land & Water Regional Plan for further details.

2.3.5 Pest species control

Works shall be undertaken in a manner that avoids the potential for distribution of pest species. This includes:

- Construction material imported from another catchment, such as rock, shall be free of plants and plant seeds before depositing it on the bed or banks of any waterbody
- No species listed in the Biosecurity NZ Unwanted Organisms Register or the Canterbury Pest Management Strategy may be planted or introduced
- To prevent the spread of pest species, including but not limited to didymo, the operator shall ensure that activities are undertaken in accordance with Biosecurity New Zealand's hygiene procedures and that machinery shall be free of plants and plant seeds before use in the riverbed
- If you are moving items between catchments you must, if staff and/or machinery and gear have been in contact with water:
 - i. **Check:** Before leaving the river, remove all obvious plant material, including clumps of algae, seeds and stems. Leave it at the affected site. If you find any later, do not wash it down drains. Treat it with the approved cleaning methods below, dry them and put them in a rubbish bin
 - ii. **Clean:** Soak and scrub all items for at least 1 minute in either hot (60°C) water, a 2% solution of household bleach or a 5% solution of salt, nappy cleaner, antiseptic hand cleaner or dishwashing detergent

- iii. *Dry*: If cleaning is not practical, after the item is completely dry to touch, wait an additional 48 hours before contact or use in any other waterway

Commentary

Note: The South Island is a controlled area for didymo. This makes it a legal requirement to clean all gear used in the water before going from one waterway to another.

Didymo has been declared an unwanted organism under the Biosecurity Act 1993. It is an offence to spread an unwanted organism. Didymo is a member of the group of single-celled aquatic plants (freshwater algae) known as diatoms. Although it is microscopic, didymo can form dense colonies called algal blooms which can be seen with the naked eye. Young colonies look like raised pimples on the surfaces of river rocks, but as the mucilage elongates to form stalks, the colonies form impenetrable mats that form thick strands and can cover all surfaces, including other plants, logs and debris. It can also form flowing 'rat's tails' that can turn white at their ends and look similar to tissue paper.

- *Colour* – Didymo is beige/brown/white but can appear green when filamentous algae grows on it
- *Touch* – although it looks slimy, it doesn't feel slimy, but rather spongy and scratchy like cotton wool
- *Odour* – live didymo has no distinctive odour
- *Strength* – didymo is very securely attached to river stones and does not fall apart when rubbed between fingers

Definitive identification requires microscopic analysis.

2.3.6 Erosion and sediment control

Works shall be undertaken to minimise the disturbance of sediment and its discharge into waterways, and to avoid the potential for erosion to occur or be exacerbated as a result of the works. This includes:

- All practicable measures shall be undertaken to minimise the discharge of sediment to the waterway arising from the works, including the use of sediment traps where practicable
- Works and structures shall not cause erosion to the bed or banks of any waterway
- Works and erosion and sediment control measures shall not prevent the passage of fish or cause the stranding of fish in pools or channels
- Machinery shall be kept out of water as far as practicable. Where this is unavoidable, all measures shall be taken to minimise bed disturbance and release of sediment (for example, use of a single crossing point, sediment and erosion control measures)
- Where the temporary diversion and damming of flow paths is undertaken, this shall not cause unplanned erosion of the bed or banks of any waterbody, and shall be reinstated so the waterbody is aligned similarly to that which existed before the diversion, unless ecological values are improved by it. Measures shall be undertaken to provide for fish passage through the diversion
- Discharges of sediment or other contaminants (but excluding diverted water) from the site shall not occur for more than 10 hours in any 24-hour period, and for not more than 40 hours in any calendar month
- The placement, stockpiling or movement of excavated sediment or sediment laden material shall not occur within

the river bed, unless it is a necessary component of a defence against water.

Note: Refer also to the Erosion and Sediment Control Toolbox for Canterbury available at esc.canterbury.co.nz. This toolbox provides details of methods of erosion and sediment control for a range of construction activities and operations.

2.3.7 Worksite reinstatement

Upon completion of works, the site shall be reinstated to similar, if not better, quality than before the works.

This includes:

- All unused materials, offcuts and equipment shall be removed from the site as soon as practicable following completion
- Any natural material disturbed by the works shall be reshaped and formed to a state consistent with the surrounding area. If this is in a gravel river bed, care must be taken to ensure that gravel is not excessively levelled or compacted. Creating a series of pool-riffle-run sections can help facilitate repopulation of invertebrates and fish when flows return to that area of the bed
- All litter and empty containers shall be removed
- All fences, gates and access ways that were in a useable condition prior to works commencing shall be reinstated to a like for like condition
- All disturbed areas must be stabilised to minimise the chance of ongoing sediment generation which may include replanting with grass, flood protection vegetation, or where site conditions and funding allow, native plant species. Revegetation responsibilities extend beyond the initial grassing and/or planting of areas and include sufficient time to achieve suitable grass strike or plant establishment
- In Significant Natural Areas, if native vegetation has been removed native plant species should be incorporated into replanting where site conditions and funding allow

Commentary

The above requirements relate to completion of works and do not preclude windrowing of material (for example, associated with drain-clearing activities) when undertaken in accordance with the relevant work-type requirements in section 3 of this Code of Practice.

2.3.8 Incidents and adverse effects management

Works should be undertaken so as not to cause adverse effects and, if any such effects do occur, these are investigated and addressed in a timely manner. This includes:

- An Incident register shall be kept recording the details of any reports of incidents received and actions taken. Details recorded shall include:
 - Time of incident
 - Works being undertaken at the time of the incident
 - Conditions at the time of the incident (weather, flow)
 - Investigations undertaken
 - Nature of any remedial action taken

The incident register shall be made available to Environment Canterbury on request.

- If adverse effects are identified either through reported incidents or observations/audits on site, action shall be taken as soon as practicable within a 48-hour period to address the cause of the effect and undertake any remedial or mitigation measures considered necessary
- In the event of a significant adverse effect occurring, works shall cease immediately, and steps undertaken to remedy the effect(s) within 24 hours of the incident occurring. These incidents must be reported to Environment Canterbury as soon as possible after the incident occurs, and no later than 24 hours after the incident has occurred.
- Accidental discovery protocols shall be in place and work shall cease if any kōiwi tangata or taonga are discovered

Commentary

Environment Canterbury will engage with Papatipu Rūnanga annually to seek input on the appropriateness of measures in addressing cultural values and to provide notification of works to be undertaken in the beds of rivers and lakes. It has been agreed that such engagement will occur via an annual hui to review the Code of Practice and work plans Environment Canterbury is certifying. Environment Canterbury will work with Papatipu Rūnanga to discuss and identify needs or opportunities for cultural or environmental training of operators undertaking works, as well as opportunities to promote use of native species for bank stabilisation through the implementation of this Code of Practice or other works undertaken by Environment Canterbury.

2.3.9 Areas of Cultural Significance

The following measures have been included throughout this Code of Practice to ensure that any potential effects of works on areas of significance to Papatipu Rūnanga are avoided, remedied or mitigated as appropriate:

- Sites of significance must be identified prior to works, and appropriate construction and accidental discovery procedures adopted to avoid, remedy or mitigate adverse effects. This should occur through engagement with the relevant Papatipu Rūnanga to identify issues and determine appropriate measures
- Persons intending to undertake works as a permitted activity in accordance with this Code of Practice are required to confirm whether the worksite areas are within Silent Files or Statutory Acknowledgement areas as identified in the Ngāi Tahu Claims Settlement Act 1998 or in Rūnanga Sensitive areas
- Where sites are within Statutory Acknowledgement Areas, Silent File areas or Rūnanga Sensitive areas, the Papatipu Rūnanga shall be notified of the intention to carry out the works and the intended type and scope of works, not less than 10 working days before commencement to enable the rūnanga to advise of any site of significance that may be affected by the proposed works
- Works shall not interfere with any sites of significance identified by Papatipu Rūnanga unless expressly agreed with Papatipu Rūnanga
- Work is to be planned to avoid disturbance of mahinga kai wherever practicable

2.3.10 Areas of ecological significance

The following measures have been included throughout this Code to ensure that any potential effects of works on areas of ecological significance (such as Significant Natural Areas defined in district plans or areas of known habitat of rare indigenous species) avoided, remedied or mitigated as appropriate:

- Sites of ecological significance must be identified before works commence on site and a record of the nature of the site (such as a description of any native species present, the presence of key areas of likely habitat for indigenous species) must be made. These features must be communicated to all workers on site, to ensure they can be avoided as far as practicable
- Where site conditions and funding allow, opportunities shall be taken to carry out ecological enhancement work such as planting appropriate indigenous plants (plant a variety of species including grasses, shrubs and trees) and creating areas of bird nesting, lizard habitat or fish habitat (such as pools and riffles in an otherwise flat area of river bed)
- Works shall be planned to avoid disturbance of lizard habitat. This includes the more stable areas of river bed which are not frequently inundated by river flows, where there are rocky/stony outcrops and areas of the berm which are not frequently disturbed by mowing or grazing. Habitable vegetation can include both exotic vegetation such as gorse, broom and rank grass and native grasses and shrubs



- Works in long-tailed bat habitat areas must be carried out in accordance with the special requirements set out under section 3.2.5 below.
- Works shall be planned to avoid any adverse effects on the habitat, spawning times or migration of native fish
- Worksites shall be checked before commencement to determine whether any native nesting birds are present. Where such birds are present, works shall be planned to avoid any adverse effects on them

Note 1: this section has not included reference to the requirements for works in salmonid spawning habitat as works in these areas are covered by separate resource consent requirements.

Note 2: Clearance of native vegetation in designated Significant Natural Areas must be notified to and approved by the relevant local authority (check the requirements that may apply for that local authority).

3 WORK TYPE REQUIREMENTS

In addition to the general requirements set out in Section 2 of this Code of Practice, there is a range of additional measures that are required depending on the specific activities carried out. Activities carried out in managing defences against water and maintaining drainage schemes reflect the various techniques that can be used including stopbank works, maintenance of flood-carrying capacity (eg drain clearing), measures to control and manage the direction and location of flood flows within the riverbed (such as rock or other groynes), and measures to protect the berm (eg rock lining or berm vegetation). Works involved in managing defences against water typically involve the following work types:

- Earthworks and land disturbance
- Works adjacent to or in flowing water
- Maintenance of culverts and structures
- Diversions (within the riverbed)
- Vegetation removal carried out in the dry parts of the bed and berms
- Vegetation and silt removal carried out in flowing water
- Use of agrichemicals

This section of the Code of Practice contains work-type requirements that must be followed when undertaking activities involving any of the above work types.

Table 3 provides a link between activity types and the work type requirements.

Activities not listed in *Table 3* may be certified as being in accordance with this Code of Practice provided they meet the general requirements, adequately address management of potential adverse environmental effects, are not specifically excluded by section 1 of the Code and are considered to be activities associated with the installation, maintenance, use and removal of defences against water as defined in Section 1.

This section of the Code of Practice is set out as follows:

- *Section 3.1* provides background information on each of the activities including a description of the activity and potential environmental effects to be managed
- *Section 3.2* contains work-type requirements for each of the identified work types

3.1 Activity descriptions and potential effects

This section provides a description of the activities and potential environmental effects to be managed. The “work type requirements” referred to under each of the activity types are found in section 3.2.

3.1.1 Drain works

The waterways which form drainage schemes are typically modifications of natural waterways which would have existed prior to the land being developed. While they may look artificial and lacking in habitat value, drains should be managed as natural waterways and opportunities should be sought to enhance aquatic and riparian habitats if this can be done without adversely affecting the function of the drainage system.

If drains are identified as inanga spawning habitat in Schedule 17 or on the planning maps of the Land & Water Regional Plan, works in these areas must be avoided during inanga spawning season. A resource consent is required if works are carried out during the spawning season in spawning habitat areas.

Outside the spawning season, consideration must be given to undertaking drain works in a manner that minimises the impact on inanga and trout spawning habitats. Consideration should also be given to the potential loss or damage of native and game bird habitat.

Weed removal is carried out to maintain effective drainage and channel capacity for conveyance of flood flows.

Aquatic weed cutting

Aquatic weed cutting is undertaken using a purpose built weed cutter boat or hand cut manually with scythes. Weed is generally removed and stockpiled on the berm so it can dry before disposal. Aquatic weed cutting is undertaken to mitigate the effects of excessive aquatic weed growth on waterway capacity and water quality. Compared with other available aquatic weed control methods, weed cutting minimises disturbance to the bed and banks of the watercourse and does not require chemicals.

Further, riparian vegetation is not disturbed, and birdlife can remain in the vicinity while the activity is carried out. The use of the weed cutter boat is limited by the size and dimensions of the waterway, and similarly hand cutting can only occur where it is safe enough to do so.

Potential effects

- Erosion of the bed and banks of the watercourse at access locations and where concentrated flows from the drying weed enters the watercourse
- Destruction of habitat and removal of a potential food source for aquatic life in the reach where the activity is undertaken
- Removal of fish and invertebrates from the watercourse
- Mobilisation of fine sediment
- Temporary loss of public amenity during activity
- Odour and amenity effects from weed drying and decomposition on berms
- Downstream effects on water quality and aquatic fauna resulting from decomposition of cut weed if it is not removed from the watercourse
- Blockage of downstream structures, such as culverts and floodgates, from cut weed

Table 3: Activities covered by Work-type Requirements

Activity type	Activity	Work-type requirements								Use of agrichemicals
		General requirements	Earthworks and land disturbance	Works adjacent to or in flowing water	Culverts and structures	Diversions	Vegetation planting	Vegetation removal – dry	Vegetation and silt removal – wet	
Drain works	Aquatic weed cutting	✓		✓					✓	
	Chemical control of weeds	✓								✓
	Mechanical weed clearance	✓		✓					✓	
	Silt removal	✓		✓					✓	
	Culvert and flood/tide gate installation and maintenance	✓		✓	✓					
	Drain bank maintenance and battering	✓	✓	✓						
	Drop structure maintenance	✓		✓						
	Lateral erosion control of drains	✓	✓	✓	✓					
River works	Stopbank construction	✓	✓							
	Stopbank maintenance	✓	✓							✓
	Channel realignment	✓		✓		✓				
	Placement of rock	✓		✓	✓	✓				
	Groyne fence construction and maintenance	✓	✓	✓		✓				
	Anchored tree protection	✓		✓				✓		
	Rock groyne construction and maintenance	✓	✓	✓		✓				
	Rock stockpiling on river berms	✓						✓		
	Hayman protection erosion or scour control	✓	✓	✓						
	Removal of flood debris	✓		✓	✓					
Tree works	Enhancement planting	✓	✓				✓			
	Pole planting and layering	✓	✓	✓				✓		
	Tree removal	✓		✓				✓	✓	
Vegetation and fairway clearance	Mechanical clearance	✓		✓				✓	✓	
	Spraying - riverbeds, drains and berms	✓								✓
	Fairway widening	✓		✓			✓	✓		
Other	Pest control	✓								✓
	Fencing, gates, signage and staff gauges	✓								
	Flood pumping	✓								
	Road / track construction and maintenance	✓	✓							
	Maintain or enhance wetlands and habitat	✓	✓	✓						

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to or in flowing water
- Vegetation and silt removal in water

Chemical control of weed

Note: Separate rules in the Land & Water Regional Plan control agricultural use. Those operating under this Code of Practice shall make sure they can comply with those requirements in the Plan, or otherwise obtain their own resource consent.

This activity involves use of chemical sprays to control target weed species on beds and banks of waterways. This is a ground-based (not aerial spraying) operation carried out to maintain drainage capacity and remove pest plants from the riparian margin area.

The activity is undertaken using spot-spraying techniques (rather than blanket spraying) as far as practicable to avoid, or mitigate potential adverse environmental impacts on the drain bank and aquatic habitats.

Potential effects

- Adverse effects on non-target species of flora and fauna
- Spill of chemicals into adjacent drains with adverse effects on aquatic life
- Short-term amenity effects of dead weeds and chemical spray odours
- Fish abundance and spawning success affected by water de-oxygenation during plant decomposition
- Removal of aquatic habitat and cover for fish and invertebrates
- Removal of inanga spawning habitat
- Spray drift into waterways or neighbouring properties

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Use of agricultural chemicals

Mechanical weed clearing

This activity involves clearance of pest plants which cannot be achieved by weed cutting or applying herbicides. These works can be undertaken together with removal of accumulated sediment and reshaping of drainage banks to restore the design capacity of drainage channels if needed.

The activity typically involves excavation of material from the drain using a hydraulic excavator with a cleaning bucket. A slotted, self-drainage weed-clearing bucket is normally used. The excavator typically operates from one bank when clearing a drain, although sometimes work from both banks may be required for wider channels. Material removed from the drain is disposed of to make sure it neither re-enters the drain nor impedes surface drainage.

Potential effects

- Mechanical clearing is non-selective and desirable plant species may be removed
- Removal of fish and invertebrates from the waterway with excavated material
- Loss of cover and spawning vegetation for native fish and invertebrates
- Deterioration of water quality from sediment release which can persist for significant periods and have the following effects on aquatic fauna:
 - Fish and invertebrates killed by water de-oxygenation and mobilisation of contaminants in heavily silted waterways
 - Fish migrations interrupted
 - Reduced food availability for invertebrates and fish
- Reduced native fish and invertebrate abundance
- Short-term adverse visual and odour effects

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation and silt removal in water

Silt removal

Silt removal involves excavation of material from the bed of a drain using a hydraulic excavator. The purpose is to remove excess sediment deposited on the channel bed to maintain channel capacity, typically in drains with a low gradient. Excavated material is generally placed adjacent to the drain in windrows where it may remain for drying before disposal.

Note: Separate resource consent is needed for this activity.

Potential effects

- Removal of fish and invertebrates from the waterway with excavated material
- Reduced native fish and invertebrate abundance
- Loss of cover and spawning vegetation for native fish and invertebrates
- Deterioration of water quality from sediment release, which can persist for significant periods and have the following effects on aquatic fauna:

- Fish and invertebrates killed by water de-oxygenation in heavily silted waterways
- Fish migrations interrupted
- Reduced food availability for invertebrates and fish
- Short-term suspended solids loading in waterways, affecting water quality
- Short-term disturbance of aquatic habitat
- Damage to drain batters, causing erosion and stability issues
- Loss of amenity from restriction of access, placement of windrows and drying of excavated material before disposal

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation and silt removal in water

Culvert and floodgate installation and maintenance

Culverts provide permanent access across drains and natural watercourses, without obstructing water flows or impeding fish passage. Floodgated culverts provide for water to be drained into a watercourse but prevent backflow through the floodgate in order to prevent flooding of upstream land. Similarly, tide gates close to prevent tidal waters travelling upstream, which can impede drainage and cause localised flooding.

Please refer to the specific regional rules for culvert installation, alteration, extension, and use to ensure compliance with those rules. Failure to comply with the regional rules for temporary or permanent culverts will require a resource consent. Refer to the New Zealand Fish Passage Guidelines for best practice options for culvert installation.

Culverts and floodgates have a limited life and need to be cleaned, maintained, repaired or replaced so their function can continue at design capacity. Inspections of floodgates are required on a regular basis and normally involve removal of any debris that may cause blockages, lubrication of hinges, cutting or spraying excessive bank vegetation, and checking that any safety barriers/signs are in sound condition.

Potential effects

- Reduction of flood-carrying capacity
- Erosion at culvert / floodgate structure
- Impedance or blocking of fish passage
- Restriction of the flow of salt water into the tidal reaches of rivers influencing the location and extent of brackish water dependant vegetation communities and spawning fish
- Temporary effect on water quality during construction
- Impact on amenity values (construction effects)
- Destruction of tidal habitat (such as salt marsh) that may have developed if a tide gate has been leaking for a period of time

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to or in flowing water

- Culverts and structures

Drain bank maintenance and battering

Drain bank re-construction and battering is undertaken to re-establish a drain alignment and/or to stabilise channel banks. Generally, the activity involves excavation, placement, compaction, and shaping of material to blend in with the surrounding area. In some instances, importation of fill material may be required. On completion of the earthworks, revegetation of the worksite is undertaken to provide a protective surface in order to mitigate erosion and scour.

As a maintenance function, this activity can be required as part of restoration work following lateral bank erosion or flood damage.

Work should be planned to enable sufficient time for grass re-establishment in favourable weather conditions. This activity must be avoided during the inanga spawning season if the works are in spawning habitat. Aim to complete this work well in advance of the spawning season so vegetation can re-establish to provide for better spawning habitat.

If works are undertaken when grass re-establishment may be difficult, consideration should be given to the use of hydro-seeding and/or irrigation to facilitate timely, good-quality grass strike to minimise potential for batter erosion and scour. Consideration to planting appropriate native species must be given where site conditions allow. Consider deploying straw bales if vegetation has been cleared in inanga spawning habitat and grass will not regrow in time for the spawning season (March to June inclusive).

Potential effects

- Short-term increased erosion potential in drains and banks before vegetation reestablishment
- Temporary effect on water quality from sediment discharge during construction
- Temporary disturbance of aquatic habitat and vegetated banks
- Removal of inanga spawning habitat and eggs if carried out during spawning season
- Re-battering can significantly improve available spawning habitat area
- Temporary impediment of fish passage during construction
- Effects on amenity values in terms of access and dust during construction

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to or in flowing water
- Earthworks and land disturbance

Drop structure maintenance

Rock drop structures are an erosion-control method used to control bed scour. Rock drop structures are constructed from graded rock. Successive drop structures are constructed in steeply graded channels. Successive drops are separated by a minimum distance along the bed and a scour pad (consisting of boulders or similar material) is constructed on the downstream side of the last drop in the series of drops. Other materials, such as gabions or power poles may be used for this method in certain circumstances. Prior to use of these materials, special approval must be sought.

Potential effects

- Temporary disturbance of bed and bank material resulting in sediment discharge
- Obstruction of fish passage and loss of available habitat
- Temporary loss of amenity during construction

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water

Lateral erosion control

Lateral erosion control activities are typically carried out where erosion of the batter will:

- Undermine fences or other structures
- Endanger a public roadway
- Cut off maintenance access along the drain
- Cause a reduction in the capacity of the drain or induce further erosion

Lateral erosion control at the erosion site can be undertaken from a selection of methodologies including rock rip-rap, gabion baskets, or timber boarding, with the resulting structure cross-section keying into the stable channel bank at the upstream and downstream ends.

Potential effects

- Short-term adverse effects on water quality from sediment disturbance and disturbance of habitat
- Short-term disturbance of riverbanks
- Loss of habitat within the banks. Lateral erosion creates habitat via a diversity of geomorphic types in the channel
- Short-term amenity effects during construction
- Change of flow paths moving erosion elsewhere, for example at the edge of the worksite if the length of the control is insufficient

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance
- Works adjacent to and in flowing water
- Culverts and structures

3.1.2 River works

River works serve to maintain braided rivers in their current position primarily by managing lateral erosion and containing flood flows within stopbanks. Land development up to the edge of rivers means that works are needed to prevent lateral movements of rivers across their historic floodplain.

As a result, there is an inherent conflict between maintaining the natural character of rivers and carrying out flood protection works. It is therefore important that the planning and delivery of

any river works, considers the impacts on natural character (and by default diversity of habitats and inhabitants of rivers) and steps are taken to avoid or mitigate these impacts wherever possible.

River works techniques include stopbanks, rock work, groynes, erosion control structures, and anchored trees along with keeping the river fairway free of debris and obstruction.

Stopbank construction

Stopbank construction encompasses building stopbank structures (including reconstruction of existing stopbanks) and improving the integrity of existing structures (for example, raising, widening, relocation, and structural integrity modifications).

Construction typically requires preparation of the worksite, followed by the importation, placement and compaction of suitable fill materials. Establishment of grass cover is completed on finished earthwork surfaces.

When opportunities arise to assess the position of a stopbank, investigate moving stopbanks further landward from the river.

Potential effects

- Constraining the river and restricting natural processes
- Degradation of natural character
- Erosion and discharge of sediment from the worksite with adverse effects on water quality
- Disturbance of riparian and aquatic habitats, including impacts on native vegetation and lizard habitat
- Impacts on Significant Natural Areas
- Temporary amenity effects from construction – access restrictions and dust

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance

Stopbank maintenance

Stopbank maintenance activities are carried out to retain or restore design height, shape and surface conditions. Maintenance activities encompass:

- Earthworks to maintain height and shape
- Maintenance of stopbank carriageways
- Removal of weeds by spraying
- Mowing of grassed surfaces
- Trimming of overhanging branches

Potential effects

- Erosion and discharge of sediment from the worksite with adverse effects on water quality
- Disturbance of habitats and wildlife
- Potential for adverse impacts on non-target species of flora and fauna, and for spray drift into waterways or neighbouring properties
- Spill of chemicals into adjacent waterways with adverse effects on aquatic life

- Temporary amenity effects from construction - access restrictions and dust

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance
- Use of agrichemicals

Channel realignment

River realignment works are undertaken to increase channel capacity and mitigate the effects of lateral erosion and bed scour.

The typical approach to realignment is to locally lower a portion of dry riverbed to create a new link to an existing, and preferably flowing, braid. Some channel realignment works may also involve the construction of training banks – low gravel bunds which help redirect flows away from the banks. These are sacrificial and would likely wash out in a flood. The work is typically carried out in an upstream direction using an excavator, loader or bulldozer.

Note: This Code of Practice only covers realignment or channel improvement within the riverbed.

Potential effects

- Temporary effects on water quality from disturbance of riverbed sediments
- Disruption of habitat and wildlife including possible stranding of fish and invertebrates in old channels
- Impacts on natural riverbed processes including erosion and flooding of berm areas
- Temporary amenity effects during construction
- Temporary fish passage barriers
- Disturbance of pool-run-riffle sequence

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Diversions

Placement of rock

Rock is used in flood-protection work to deflect floodwaters from potentially vulnerable structures (for example, bridge abutments, stopbanks, support and intake structures), to train flood flows to the main flood channel and to absorb energy in floodwaters. Rock may be placed in a linear formation (such as rock lining of the berm to prevent erosion), around structures (to protect pylons or bridge abutments for example) or at an angle to the main flow (such as rock groynes).

Rock armouring is required to be topped up as rock settles or following flood events. Rock is carted to the placement site and either tipped or placed mechanically. Rock should usually be placed as there is greater control over placement so quantities can be optimised. However, mechanical placement is not always possible, in which case tipping may be used.

Potential effects

- Short-term disturbance of bed and bank material during placement
- Disturbance of vegetation to access the worksite
- Machinery working in or close to flowing water can discharge sediment or hazardous substance fuel
- Short-term amenity effects
- Accidental spread of pest plants in rock material
- Impacts on natural riverbed processes including erosion and flooding of berm areas

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Diversions
- Culverts and structures

Groyne fence construction and maintenance

Groyne fences are used to control bank erosion and consist of a series of vertical piles and horizontal wires against which whole trees or poles are attached with foliage extending into the stream channel.

This technique may be specified for a job, however it must be approved by the Environment Canterbury regional lead river engineering and manager river engineering and may only be considered for use in areas where it will not obstruct, constitute or become a danger to maritime safety. **The Canterbury Regional Council Navigation Safety Bylaw 2016 restricts the construction of structures that may form a navigation safety risk.**

These structures must be removed from the river bed immediately if they are damaged and pose a safety risk.

Potential effects

- Temporary effects on water quality from sediment disturbance during construction and maintenance works
- Temporary disruption of in-stream and bed habitats during maintenance works
- Change of flow paths moving erosion elsewhere; for example, at the edge of the worksite if the length of the control is not sufficient, or to adjacent infrastructure
- Temporary amenity effects during maintenance works
- Navigation safety hazard

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance
- Works adjacent to and in flowing water
- Diversions.

Anchored tree protection

Anchored tree protection measures are used to control lateral bank erosion. Construction typically requires clearance of the site adjacent to the berm edge, and anchoring of trees or tree bundles in place with anchor ropes and deadmen.

Potential effects

- Temporary effects on water quality from sediment disturbance during construction
- Temporary disruption of in-stream and bed habitats during construction
- Impacts on natural riverbed processes including erosion and flooding of berm areas, which in turn effects natural character
- Possible disturbance of native vegetation within the berms and impact on Significant Natural Areas
- Possible removal of long-tailed bat roosting habitat (in South Canterbury only)
- Change of flow paths causing moving erosion elsewhere; for example, at the edge of the worksite if the length of the control is insufficient, or to adjacent infrastructure
- If bank erosion occurs behind the anchored tree line, the exposed anchors could become a navigational hazard if not removed or repaired. If this occurs, they must be removed immediately

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation removal – dry

Rock groyne construction and maintenance

Rock groynes are used to control the location of the active channel within the riverbed and to control lateral bank erosion. Groyne construction typically includes formation of an access track to the site, work to direct flow away from the site, formation of gravel embankments along a proposed protection line, dumping and placement of rock on the proposed protection line, and reinstatement of access tracks on completion of work.

Potential effects

- Temporary effects on water quality from sediment disturbance during construction
- Temporary disruption of in-stream and bed habitats during construction
- Change of flow paths moving erosion elsewhere; for example, at the edge of the worksite if the length of the control is insufficient, or to adjacent infrastructure
- Temporary amenity effects during construction
- Impacts on natural riverbed processes including erosion and flooding of berm areas, which in turn effects natural character

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)

- Earthworks and land disturbance
- Works adjacent to and in flowing water
- Diversions

Rock stockpiling on river berms

Rock is stockpiled at strategic locations on berms to make sure a supply is readily available during flood events for measures to be taken to limit the erosion of berms and groynes, or adjacent to flood-protection structures. Rock stockpiling is undertaken because:

- Quarry sites are typically located a long way from where the rock is required in an emergency
- Quarries may have limited or no access during flood events
- The rate of rock supply from quarries to the site is limited to the production capacity of the quarry and the capacity of transportation

Proposed rock stockpile sites are cleared of vegetation and levelled so trucks can manoeuvre both in the dumping phase and later in the loading. Typically, the stockpile area is fenced off and a locked gate is installed for public safety purposes and to minimise theft.

Potential effects

- Temporary disturbance to berm habitat during stockpile establishment and replenishment
- Propagation of weed species in the stockpile
- Uncontrolled disturbance to berm habitat from theft/ uncontrolled removal of stockpiled rock

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Vegetation removal – dry

Hayman protection erosion or scour control

Hayman protection is an erosion/scour control method typically used for controlling bank erosion in small, steep-sided and graded waterways.

To reduce deposition of sediment downstream and stabilise the waterway, construction of Hayman protection involves placement, fastening and anchoring of vertical poles along a design alignment against which netting is secured. Installation of the poles and netting requires excavation, which is backfilled to typical bed level.

Potential effects

- Impacts on natural riverbed processes including erosion and flooding of berm areas, which in turn effects natural character
- Temporary effect on water quality from sediment disturbance during construction
- Temporary disturbance of bed and bank habitat during construction
- Short-term amenity effects during construction
- Modification of flow paths can move erosion elsewhere; for example, to the edge of the worksite if the length of control is insufficient, or towards other flood-protection structures

- If structure becomes washed out, the hayman fence could become a navigational hazard if not removed or repaired

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance
- Works adjacent to and in flowing water

Removal of flood debris

Flood events can wash large debris such as trees and stumps into the river. Viable debris can regrow and cause vegetated islands to form and the debris can redirect flows towards the banks. However, it is important that debris that is not likely to re-grow, will not cause damage to bridges and other structures in the bed or cause flows to be deflected is left in place. This debris provides vital habitat and cover for fish and invertebrates. The aim of debris removal should be to just remove the debris that may cause damage, and not to completely clear all debris from the river.

In braided waterways, removal is carried out in the dry typically using excavators, loaders and trucks. The work is timed, and site access is obtained, considering wildlife and ecological values. This sometimes dictates the short-term stockpiling of the cleared material on the berm. In single-thread waterways, debris removal is carried out using an excavator or dragline working from a bank. Timing, staging and access are determined considering wildlife and ecological values.

Potential effects

- Temporary disturbance of the channel bed, banks or berms
- Temporary water-quality effects from discharge of sediment
- Temporary amenity effects on areas of high public use
- Removal of habitat and cover for fish and invertebrates

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water

3.1.3 Tree works

Enhancement planting

Please refer to the specific regional rules for vegetation planting and removal to ensure compliance with those rules. Failure to comply will require a resource consent.

Enhancement planting is undertaken to improve and maintain ecological values of riparian and in-stream habitats, where a variety of species (predominantly natives) are planted among the existing flood-protection vegetation. This activity is often undertaken in conjunction with construction and maintenance of flood-protection structures. Enhancement planting is particularly encouraged in Significant Natural Areas.

Typically, enhancement planting requires preparation of the worksite by removal of existing weed and grass cover and minor earthworks/landscaping. Preparation is followed by site planting and a maintenance period to help with successful plant establishment.

Make sure that plants listed in the Biosecurity NZ Unwanted Organisms Register are not used for enhancement planting projects.

Potential effects

- Temporary disturbance of banks/berm resulting in sediment discharges to water
- Temporary disturbance to public access and amenity
- Failure of plants to establish on site can cause adverse amenity effects in terms of dead vegetation, erosion and sediment discharge from exposed soil, and establishment of weed species

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Earthworks and land disturbance

Pole planting and layering

Please refer to the specific regional rules for vegetation planting and removal to ensure compliance with those rules. Failure to comply will require a resource consent.

Pole planting is carried out to establish edge protection in areas cleared of vegetation such as gorse, broom or old man's beard. Where soils have good moisture-holding capacity, or the water table is within about 600 millimetres of the surface, poles can be placed in lines made by a bulldozer, loader or excavator. In dryer areas, poles are planted at greater depth in holes formed by excavators or bulldozers.

Layering is undertaken to increase the density of existing live-edge protection. Trees are felled in a downstream direction with the head in the lowest part of the adjacent bed, and 25% to 30% of the stump is left attached to the parent stump.

Poles used for planting are typically modern varieties which are male sterile clones which do not have the same ability to spread like crack or grey willow. Consider using appropriate native species for bank stabilisation and erosion control where possible.

Note: Crack, grey or pussy willow must not be planted. These species are listed in the Biosecurity NZ Unwanted Organisms Register and the Regional Pest Management Plan and it is a prohibited activity to plant or propagate these species.

Potential effects

- Temporary disturbance of channel bed and banks
- Habitat disturbance to create site-access tracks
- Temporary water-quality effects from discharge of sediment
- Temporary amenity effects in areas of high public use
- Impacts on natural riverbed processes including erosion and flooding of berm areas, which in turn effects natural character
- Barriers to recreation access.
- Impacts on lizard habitat

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)

- Earthworks and land disturbance
- Works adjacent to and in flowing water
- Vegetation removal – dry
- Vegetation planting.

Tree removal

Please refer to the specific regional rules for vegetation planting and removal to ensure compliance with those rules. Failure to comply will require a resource consent.

District Councils may also have separate rules regarding vegetation removal or works in Significant Natural Areas and in South Canterbury specifically, disturbance to the long-tailed bat habitat.

Tree removal is typically undertaken as part of maintenance of channel-edge protection or to maintain vegetation health.

Tree removal typically occurs when trees are diseased or too large, or are in locations that restrict channel capacity. Other maintenance activities requiring tree removal can include taking wind-blown trees from access tracks or stopbanks, tree removal in berm plantations heavily infested with old man's beard and other pest species, or flood-damaged trees.

Tree removal is typically not carried out in the active channel area, and if trees are felled into the active channel they are quickly removed. The root systems of felled trees continue to support bank stability and are often retained for this purpose.

Potential effects

- Temporary effects on water quality from sediment disturbance
- Temporary disturbance of riparian habitat
- Temporary disruption to amenity and access
- Loss of long-tailed bat roosting trees, killing or injuring of bats, disturbance of the bats or loss of feeding habitat
- Loss of habitat or native vegetation and impact on Significant Natural Areas

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation removal – dry

3.1.4 Vegetation and fairway clearance

Please refer to the specific regional rules for vegetation planting and removal and agrichemical use to ensure compliance with those rules. Failure to comply will require a resource consent.

District Councils may also have separate rules regarding vegetation removal in Significant Natural Areas and in South Canterbury specifically disturbance to trees in long-tailed bat habitat areas.

Mechanical clearance

This activity includes removal of vegetated islands or areas of berm vegetation including roots and ripping of the cleared work area. The activity can occur as part of the site preparation works for flood-protection measures, or as part of the maintenance of fairway alignment and capacity or to prepare for bird nesting islands.

Potential effects

- Temporary effects on water quality from discharge of sediment
- Disturbance of habitat from the works and site-access tracks
- Accidental removal of native vegetation and impacts on Significant Natural Areas
- Disruption to lizard habitat
- Loss of roosting trees for long-tailed bats
- Temporary disruption to amenity and access in areas of high public use

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation removal – dry

Spraying - riverbeds and berms

Please refer to the regional rules for agrichemical use.

This activity involves chemical sprays to control weeds in the fairway and berms.

Spraying can be done by knapsack, truck/tractor mounted spray units or by helicopter. Aerial spraying of fairways is carried out where significant areas of weed growth need to be controlled, or the areas are inaccessible by machine or vehicle.

Potential effects

- Adverse impacts on non-target species of flora and fauna
- Fish abundance and spawning success affected by water de-oxygenation during plant composition
- Removal of aquatic habitat
- Removal of inanga spawning habitat
- Spills of chemicals into surface water with adverse effects on aquatic life
- Short-term amenity effects of access restrictions, dead weeds and chemical spray odours
- Possible disturbance of native vegetation within the berms and impact on Significant Natural Areas
- Spray drift into waterways or neighbouring properties

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Use of agrichemicals

Fairway widening

Tree removal to facilitate fairway widening is typically undertaken where trees are too large or there is restricted channel capacity. The activity requires access to the target vegetation, and both the vegetation and its roots are typically totally removed.

Potential effects

- Temporary effects on water quality from sediment disturbance
- Temporary disturbance of riparian habitat

- Temporary disruption to amenity and access
- Possible disturbance of native vegetation within the berms and impact on Significant Natural Areas
- Possible removal of long-tailed bat roosting habitat (in South Canterbury only)

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Works adjacent to and in flowing water
- Vegetation removal – dry

3.1.5 Other

Pest control

The control of pest animals such as rabbits is undertaken to maintain the integrity and function of planting areas (flood protection vegetation and native enhancement planting) and flood protection structures.

Pest control typically involves laying of bait. This has the potential for adverse effects on non-target species in both riparian and aquatic habitats if appropriate measures are not adopted. Further, bait laying has the potential to adversely impact the amenity and recreational values of a control area.

Potential effects

- Adverse effects on non-target flora and fauna
- Poisons entering waterways and adversely affecting fish life and aquatic vegetation
- Short-term effects on amenity values

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Use of agrichemicals

Fencing, gates, signage and staff gauges

Fencing, gates and signage are erected and maintained to warn of danger, control activities (for example, lighting of fires, shooting, control vehicle speed, dumping of rubbish), protect flora and fauna, inform or direct. Staff gauges are installed and maintained to monitor water levels. Construction typically involves erection of posts and removal of a small area of vegetation to ensure visibility. For information panels, a small shelter may also be constructed.

Potential effects

- Temporary habitat disruption during construction and maintenance actions
- Trapping of debris, causing localised erosion and barriers to species travel
- Amenity effects if inappropriately designed, sited or constructed

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (refer to Section 2 of this Code of Practice)

Flood pumping

Flood pumping is undertaken in emergency situations to lower water levels threatening flood-protection infrastructure and adjacent land uses.

It is done in a planned and controlled manner with flood pump use determined by a deployment protocol that includes gauge-specific trigger water levels.

When not in use, flood pumps and associated fittings are stored under cover, away from any watercourse such as at a depot.

Potential effects

- Short-term erosion at the pump discharge location
- Transfer of polluted surface water from a watercourse to the outlet location with adverse effects on fish life and aquatic vegetation

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)

Road/track construction and maintenance

Road and tracks are formed and maintained to provide access for the maintenance of river-protection works, and for access to infrastructure and recreational users. They also serve as a control to limit disturbance of habitat and wildlife. Track formation on the berm involves grading topsoil to one side and shaping underlying gravel (or adding gravel from an adjacent suitable and approved riverbed site). Formation of riverbed tracks is carried out by a grader or bulldozer levelling riverbed gravel along an alignment chosen to avoid disruption to habitat and wildlife.

Potential effects

- Discharge of sediment from erosion of road/track surface and soil disturbance during construction
- Disturbance to habitat during construction
- Temporary loss of amenity during construction and maintenance activities

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Earthworks and land disturbance

Riverbed works to maintain or enhance wetlands and habitat

Riverbed works undertaken to maintain or enhance wetlands and habitat include:

- Enhancing/managing form and alignment of the watercourse/wetland
- Removing weedy vegetation and shaping gravels for bird nesting islands
- Managing water levels and water-quality parameters (eg temperature and oxygen depletion)

While this activity is undertaken to achieve beneficial effects for

the worksite, the activity does have the potential to trigger short-term adverse effects from construction/maintenance works in terms of erosion, disruption to habitat and amenity effects.

Potential effects

- Temporary effects on water quality from disturbance of bed and bank sediment
- Temporary disruption to habitat and wildlife
- Temporary amenity effects during construction/maintenance activities

Work-type requirements

Refer to the following work-type requirements when undertaking this activity:

- General requirements (see Section 2 of this Code of Practice)
- Earthworks and land disturbance
- Works adjacent to and in flowing water

3.2 Work-type requirements

This section sets out the requirements to be followed for each of the work types identified in section 3.1. Activities carried out to manage defences against water and to carry out drainage scheme maintenance typically require a combination of work types.

Requirements relevant to the work being carried out shall be identified and included in the work plan for certification. Not all requirements will be relevant for different activities.

Refer to Section 6 “Useful links and guidance documents” for a list of relevant rules in the Land and Water Regional Plan (as at August 2018).

3.2.1 Work-type Requirements: Earthworks and land disturbance

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving earthworks and land disturbance, the following measures shall be taken:

- Where earthworks are located near open water, and there is potential for sediment to enter the waterway, erosion and sediment control measures must be deployed on site to prevent sediment discharges. See the Erosion and Sediment Control Toolbox for guidance
- All practicable measures shall be taken to avoid nuisance effects of dust. Use of dust suppressants (other than water) must comply with specific rules in the proposed Land & Water Regional Plan to be a permitted activity
- Works shall be planned to minimise the area disturbed as far as practicable. If large areas need to be disturbed, consider staging the earthworks to minimise the exposed area
- Works shall avoid the clearance of native vegetation wherever possible
- All earthworks and land disturbance must consider the impacts on lizard habitat. This includes the more stable areas of river bed which are not frequently inundated by river flows, where there are rocky/stony outcrops and areas of the berm which are not frequently disturbed by mowing or grazing. Habitable vegetation can include both exotic vegetation such as gorse, broom, and rank grass, and native grasses, and shrubs
- Design and construction of defences against water shall take into account transition effects at upstream and downstream

ends to mitigate against potential for erosion and scour

- Where works are undertaken on or near existing stopbanks, all practicable measures shall be taken to make sure the integrity of the stopbank is maintained, including any ancillary structures or features such as culverts
- The supply, placement and compaction of fill materials, shall be undertaken to minimise adverse effects on wildlife, vegetation and ecological values
- Excavated material not removed from the site shall be stockpiled safely outside the flowing water while awaiting backfilling
- On completion of defence against water construction works, the site shall be contoured to match existing ground levels:
 - If works are adjacent to stopbanks, drainage features shall be reinstated to prevent ponding of water at the stopbank toe
 - Work sites in the active channel must be reinstated to a condition similar to that of the surrounding natural river bed
- Disturbed areas of river or drain banks shall be stabilised as soon as practicable following completion of earthworks to minimise the potential for soil erosion and sediment discharge. This may involve sowing grass, planting with appropriate native species, hydroseeding/hydro mulching or placement of appropriate erosion protection fabrics/mats
- Ensure that vegetation cover (whether grass or other planting) is achieved as soon as practicable, including appropriate planting conditions and watering to achieve sufficient growth and cover
- In Significant Natural Areas, replanting should use locally sourced native species where site conditions allow
- For stopbanks administered by Environment Canterbury, slope stabilisation shall be undertaken by grassing. The planting of tree or shrub vegetation is not recommended as root establishment in stopbanks can undermine performance

For stopbanks administered by Environment Canterbury, slope stabilisation shall be undertaken by grassing rather than planting tree or shrub vegetation as root establishment in stopbanks can undermine performance.

3.2.2 Work-type Requirements: Work adjacent to or in flowing water

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works adjacent to or in flowing water, the following measures shall be taken:

- Plan the worksite layout carefully to minimise the extent of works and time spent working in the water
- Machinery should work from the watercourse banks (in the dry) rather than in flowing water
- Erosion and sediment control measures must be deployed on site to prevent sediment discharges. See the Erosion and Sediment Control Toolbox for guidance
- Where there is potential for fish to be stranded, the person or organisation undertaking the works shall ensure that native and sport fish recovery is conducted for the duration of the works and at least one day after they have been completed. Fish recovery shall be conducted both instream (for suffocating fish) and bank side (for stranded fish). Recovered fish shall be

returned upstream of the targeted section of waterway

- Fish-spawning areas must be avoided during spawning periods. Refer to General Requirements: Timing of works for details. Resource consent may be required if this cannot be achieved
- Where a fish passage cannot be maintained for the duration of the works, the period during which a fish passage is restricted shall be minimised as far as practicable and fish recovery shall be undertaken where there is any potential for fish stranding
- Discharges of sediment, organic material and water from the site shall not occur for more than 10 hours in any 24-hour period, and for not more than 40 hours in any calendar month (see rule 5.141 of the Land and Water Regional Plan)
- Where temporary diversions are constructed to mitigate potential effects, these shall be planned to take into account current and anticipated flow rates, size of the existing tributary and distributary braids, velocity of water and angles of flow. Work plans shall anticipate rising water levels immediately upstream of any diversion and in channels accepting diverted river flows. Drainage of drying channels shall be checked to make sure any pools created retain a downstream connection for a fish passage
- Any stream crossings shall be constructed to cause minimum disturbance to banks and vegetation. Wherever practicable, temporary culverts shall be installed rather than providing crossing points through flowing water (temporary culverts must still allow for free fish passage). If crossing points through flowing water are required, these should generally be located upstream of a riffle where possible
- Wherever practicable avoid disturbing the structure of the beds of waterways, including visible dry channels
- Upon completion of works, the area should be reshaped to a state consistent with the surrounding natural character of the river bed

3.2.3 Work-type Requirements: Culverts and structures

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving culverts and other structures (including rock protection), the following measures shall be taken:

Culverts

- Culverts shall not impede a fish passage or cause the stranding of fish in pools or channels. Culverts should be designed and installed in accordance with the “Stream Simulation” approach as outlined in the New Zealand Fish Passage Guidelines
- Any material deposited in the waterway associated with the construction of the culvert must be inert and of colour and material type consistent with the surrounding natural environment. Materials must not contain or be coated in hazardous substances
- Culvert founding conditions shall prevent settlement or scour at the culvert inlet or outlet
- Headwalls or similar scour protection should be installed with the culvert to prevent bank erosion and scour around culvert inlet and outlets
- Install the culvert at design levels and grade
- The culvert size must provide for a 5% AEP flood flow capacity without increasing upstream water levels

For guidance on culvert installation and sediment control during construction, refer to the following publications:

- Christchurch City Council’s “Waterways, Wetlands and Drainage Guide”
- Environment Canterbury’s “Erosion and Sediment Control Toolbox”
- NIWA / DOC “New Zealand Fish Passage Guidelines for Structures less than 4m”

Structures

- Works shall be undertaken to minimise erosion of the beds and banks
- Stream or drainage channel flows shall be temporarily dammed or diverted away from the site to allow for works to be undertaken in the dry. Where this is not possible, works shall be planned so the impact on flowing water is kept to a minimum
- Design and installation of defences against water shall ensure the capacity of the watercourse is not reduced and impacts on natural character are minimised
- Materials used for construction shall be free of contaminants and suitable for the structure. For example, rock used should be suitable for the purpose (including size, grading, shape and quality) and be free of soil, mud, clay or other soluble debris
- Rock should be sourced locally as far as possible to fit in with the surrounding landscape. It shall have a similar appearance to existing rock-protection works in the vicinity
- Structures must not constitute or become a danger to navigational safety

3.2.4 Work-type Requirements: Diversions

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving diversions of active channels within the riverbed, the following measures shall be taken:

- Diversions shall be planned to take in to account current and anticipated flow rates, size of the existing tributary and distributary braids, velocity of water and angles of flow
- The time spent to construct the diversion must be minimised as much as possible to reduce the duration of sediment discharges
- Drying channels shall be checked to make sure any pools retain a downstream connection for fish passage
- Any temporary diversions shall not be in place for more than four weeks in any 12-month period
- Fish recovery shall be conducted in drying channels and stranded fish returned to flowing water
- A fish passage shall not be restricted
- Changes or drying of channels shall be planned with particular regard to nesting bird islands downstream to make sure these islands remain with flow on both sides to prevent increased access by people, dogs and predators

Note: The above covers both temporary and permanent diversions of active channels within the riverbed. “Permanent” diversions may be undertaken, for example, to divert active braids away from defences against water to prevent erosion, scour or undermining. These diversions are typically carried out with low gravel bunds which could be washed out in a high flow event.

3.2.5 Work-type Requirements: Vegetation removal outside flowing water (dry)

Please refer to the specific regional rules for vegetation planting and removal and for agrichemical use to ensure compliance with those rules. Failure to comply will require a resource consent.

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving vegetation clearance outside flowing water (all works in the dry such as on the river berm), the following measures shall be taken:

- Works shall be planned to minimise the extent of vegetation affected
- Clearance of native vegetation must be avoided as far as practicable
- All earthworks and land disturbance must consider the impacts on lizard habitat. This includes the more stable areas of riverbed which are not frequently inundated by river flows, where there are rocky/stony outcrops and areas of the berm which are not frequently disturbed by mowing or grazing. Habitable vegetation can include both exotic vegetation such as gorse, broom and rank grass and native grasses and shrubs.
- All removed material shall be taken to an appropriate disposal site or windrowed for composting in an area where it will not cause adverse effects in flood events. This may be within the riverbed but outside areas of active channels/flowing water
- Berm vegetation which provides a flood protection/attenuation function shall not be disturbed or removed without the prior written approval of the authority responsible for the flood protection scheme
- Wherever possible, clearing of vegetation shall be undertaken to remove it with its roots intact, rather than breaking vegetation over. This should be achieved by root raking or a similar process that minimises the volume of riverbed material shifted
- Cleared vegetation is not pushed into flowing or ponded water
- No vegetation used for flood control or bank stabilisation shall be disturbed, removed, damaged or destroyed except by, or on behalf of, the person or agency responsible for maintaining that vegetation for flood control purposes
- No woody vegetation may be disposed of in the fairway (open gravel area between the berms).
- The disturbance, removal, damaging or destroying of any plant or vegetation in, on or under the bed of any river or lake listed as a “High naturalness waterbody” in Sections 6 to 15 shall only be of (a) a non-indigenous species; or (b) indigenous species that form the understorey of plantation forest that is being harvested and a minimum 5 metres set back from the river or lake is provided upon replanting (if replanting occurs)
- Except for clearance around utilities or existing structures, removal of a species listed in the Biosecurity NZ Unwanted Organisms Register or the Canterbury Pest Management Plan; or clearance for the purposes of maintaining existing fence lines, vehicle tracks, firebreaks, drains, ponds, dams, or crossing, the activity shall not occur in an inanga or salmon spawning site listed in Schedule 17 and in the maps of the Land & Water Regional Plan
- In a flood control rating district scheme area, the introduction or planting of any plant is by or on behalf of the person or agency responsible for maintaining that vegetation for flood-control purposes

Note: Also refer to additional requirements that may be specified in district plans.

Specific requirements in the long-tailed bat habitat areas in South Canterbury:

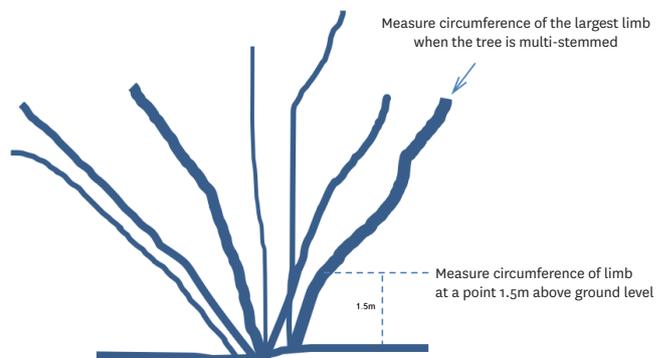
- No known roost trees may be removed for flood protection works. Known roost trees have been mapped, and many have signs and aluminium bands in place to indicate that it is a roost tree.
- Prior to being used in flood protection work, trees must be assessed for the likelihood of being a roost tree. An initial on the ground assessment using the following criteria must be carried out to determine if further assessment is required.

Criteria:

- Circumference of the trunk or largest limb of the tree is 120cm or greater (see note below for measuring multi-stemmed trees); and
- Tree is aged 15 years and older; and
- Tree has visible gnarls, nooks, holes, splits, dead wood, broken spars, and rough or peeling bark; and
- Tree is generally “misshapen”

Measuring trees – at a height 1.5m above ground level, measure the trunk or if the tree is multi-stemmed, measure the largest limb.

- If the tree meets the above criteria, an assessment will be made by an independent assessor who will determine if the tree is likely to be a roost tree. Note: In the first instance, if the tree does meet these criteria, search for alternative trees that can be used. If no other trees are available, then engage an independent assessor



- If the tree is determined by the independent assessor as a possible roost tree, then the tree must not be used for flood protection works. However, if the tree needs to be removed for safety or scheme integrity purposes (such as trees growing on or very close to stopbanks) or used in emergency flood protection work, the roost holes must be made unviable to ensure there are no bats in the roost when removal occurs. It must first be established that there are no bats within the tree before it is made unviable
- If the tree does not meet the criteria above, or the independent assessor has determined the tree is not likely to be a possible roost tree, then it may be used in flood protection work. Before removing, also establish whether or not any of the surrounding trees are possible roost trees. Care must be taken not to damage the surrounding roost trees when felling the target tree

- Prior to poplar harvests, the Geraldine/Raukapuka office of the Department of Conservation must be consulted and the likelihood of roost trees assessed. Harvesting may only progress once DOC is happy that the risk of removal of roost trees is minimal. If roost trees need to be left within the harvest area, a cluster of trees must be left in place to minimise the chance of wind throw of the roost tree
- Harvesting of poplar trees should only occur outside of the periods when bats are immobile in the trees such as when females rear young or when they are in torpor (hibernating). Harvesting should be avoided in winter and October to December when females are pregnant or when pups cannot fly
- In available berm areas where site conditions and funding allow, facilitate the planting of a mixture of native (or appropriate exotic species such as oak or macrocarpa) to provide for short-term and longer-term roost and feeding habitats. Species like cabbage tree, kanuka and houhere provide habitat in the short term (eg 10-100 years) and species like tōtara, beech and kahikatea will provide roosts in the longer term (eg 20-100+ years)

3.2.6 Work-type Requirements: Vegetation planting

Please refer to the specific regional rules for vegetation planting to ensure compliance with those rules. Failure to comply will require a resource consent.

In addition to the general requirements set out in Section 2 of this Code of Practice, and other work type requirements such as earthworks and land disturbance, when undertaking works involving vegetation planting the following measures shall be taken:

- Introduction or planting of vegetation shall not be of a species listed in the Biosecurity NZ Unwanted Organisms Register or the Canterbury Pest Management Plan
- Introduction or planting of vegetation in, on or under the bed of any river or lake listed as a “High naturalness waterbody” in Sections 6 to 15 of the proposed Land & Water Regional Plan shall only be of indigenous plant species that occur naturally in the catchment
- Where site conditions and funding allows, incorporate planting of appropriate native species, particularly within Significant Natural Areas.

3.2.7 Work-type Requirements: Vegetation and silt removal in water

Please refer to the specific regional rules for vegetation and fine sediment removal to ensure compliance with those rules. Failure to comply will require a resource consent. Note: A resource consent is required for fine sediment removal from natural rivers.

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving vegetation or silt removal from water, the following measures shall be taken:

- Within inanga spawning habitat areas, bank vegetation inundated by high tides shall not be unnecessarily disturbed to minimise the potential for damaging inanga spawning habitat. Disturbing this vegetation during the period 1 January to 1 June will require separate resource consent
- Inspect the targeted section of the waterway and identify features such as pools, riffles, woody debris, salmon/trout spawning habitats, or threatened species habitats that should not be disturbed during excavation and make sure these

features are preserved as far as practicable

- Small variations in streambed profile have minimal effect on hydraulic efficiency and provide habitat diversity. Avoid excessive levelling of the streambed to preserve these features as far as practicable
- Identify areas of native plantings before works start to ensure machinery doesn't damage the plants, or place removed weed and debris on the planted area
- When removing material from the watercourse, this shall be done without unnecessarily changing the watercourse shape or damaging any structures
- Do not unnecessarily scrape the bed or banks with the digger bucket, bare banks are more prone to erosion and slumping and removing all bank vegetation removes habitat and refuges for fish and insects.
- Where possible, use low impact cleaning methods, such as hand clearance or a weed cutting boat ahead of more invasive techniques like excavators or chemical sprays
- When mechanically clearing weed, use a weed cleaning bucket, this captures weed but allows fish to escape from the bucket before being removed from the waterway
- Where possible, avoid mobilising sediment by, for example, cutting weed rather than pulling roots where the bed is dominated by a fine sediment base
- Native and sport fish recovery is conducted for the duration of the works and at least one day after they have been completed. Fish recovery shall be conducted both instream (for suffocating fish) and bank side. Recovered fish shall be returned upstream of the targeted section of waterway
- Provide a means of ensuring that disturbed vegetation and debris does not migrate downstream (by, for example, using a debris catcher). Captured material should be placed on the waterway banks in a position and alignment which enables accidentally removed fish to return to the waterway themselves
- Ensure that any disturbed vegetation and debris does not accumulate around culverts, fences or other structures. Such structures shall be checked on completion of the activity and any caught vegetation or debris removed
- The spoil material must also be searched for accidentally captured fish (native and sports), koura and kākahi and any animals found must be returned to the waterway. This recovery must be carried out during the works and for a period of 24 hours after works are completed
- Where there is a confining layer between the drain and groundwater, make sure drain clearance works do not breach this layer
- All silt or vegetation shall either be removed from the site to an appropriate disposal site or stockpiled or windrowed nearby for drying and/or composting in situ
- If vegetation or silt removed from the watercourse is to be dried and/or composted near the worksite, the drying and composting area shall be located and shaped, so it does not allow any concentrated liquid formed to enter the waterway directly. This may require contouring of the site and/or installation of leachate collection and treatment areas
- Where practicable, only remove fine sediment from the channel. Where course substrate is present it provides valuable habitat for fish and invertebrates and has the added

benefit of being a poor root environment for recolonising macrophyte

- Where possible, regrade banks and plant appropriate native riparian species to provide nutrient filtration and shading to work towards a longer-term solution for excessive weed growth
- No woody vegetation is disposed of in, on, over or under the bed of a lake or river other than for in situ decomposition of sprayed weeds that are grown in, on, over or under the bed
- Except for clearance around utilities or existing structures, removal of a species listed in the Biosecurity NZ Unwanted Organisms Register or the Canterbury Regional Pest Management Plan, or clearance for the purposes of maintaining existing fence lines, vehicle tracks, firebreaks, drains, ponds, dams or crossing, the activity shall not occur in an inanga spawning (during the period 1 January to 1 June) or salmon spawning site listed in Schedule 17 or the planning maps of the Land & Water Regional Plan
- If removing fine sediment associated with the maintenance of a defence against water or within an artificial waterway in urban areas:
 - Carry out the removal in dry conditions or create an isolated working environment separated from any surrounding flowing water
 - Before carrying out any removal works determine if the sediment is likely to be contaminated (carry out appropriate testing following industry good practice guidance)
 - Transport the material using good handling practices, such as using sealed trucks and covering the load
 - Dispose of the material at an approved facility
 - Reinstate/stabilise the site to manage any ongoing discharges

3.2.8 Work-type Requirements: Use of agrichemicals

Please refer to the specific regional rules for agrichemical use to ensure compliance with those rules. Failure to comply will require a resource consent.

In addition to the general requirements set out in Section 2 of this Code of Practice, when undertaking works involving agrichemicals, the following measures shall be taken:

- Consider any practicable economic alternative management methods to spraying aquatic weeds (for example, hand or mechanical clearance)
- The agrichemical being used shall be approved under the Hazardous Substances and New Organisms Act 1996 and shall be used in accordance with the conditions of the approval
- Notify rūnanga 10 days before weed spraying including location, chemicals to be used, timing and spray method
- Agrichemicals shall not be mixed, and equipment and containers shall not be cleaned or rinsed:
 - Within 5 metres of a surface waterbody or bore
 - In the bed of the river or lake, unless the mixing or dilution takes place within a sealed, banded system that contains a volume of at least 110% of the largest spray tank to be filled, or the mixing or dilution is for a hand-held application technique or method
- If water used for mixing or dilution is taken from surface water

or groundwater, a backflow prevention system shall be in place and operational to prevent the agrichemical flowing back into the source water

- Where there is a discharge to surface water, the use of agrichemicals shall not occur within a group or community drinking water protection zone (as set out in Schedule 1 of the proposed Land & Water Regional Plan), or into a river or artificial water course within 250 metres upstream or 100 metres downstream of any surface water intake. Within a lake, the discharge may not be within 250 metres of any surface water intake
- Staff undertaking spraying shall hold a current and appropriate certification
- Signs shall be erected advising of the activity and location before spraying starts and stay in place for the duration of the work
- Native vegetation must be avoided when spraying
- In drainage scheme waterways, spot spray techniques shall be used as far as practicable to avoid spraying of non-target species
- Avoid blanket spraying large areas of vegetation in drainage schemes. Stagger spraying, to treat sections of waterway with a rest period of at least 30 days in between spraying. This will help minimise deoxygenation of the water through decomposing weed
- Undertake works in calm conditions as far as practicable to avoid spray drift
- Consider timing of aerial spraying, to avoid impacts on recreational users and bird nesting
- A daily work-in-progress logbook shall be maintained and be available onsite with the operator. The logbook shall include the following information:
 - Operator names
 - Start and finish times
 - Location
 - Target plants
 - Chemical (including additives) used, manufacturer's names and mixing rate
 - Method of application
 - Plant condition
 - Estimated wind speed and direction
 - Weather conditions
 - Rain (start/finish time)
- Avoid spraying vegetation that could provide inanga spawning habitat between the period 1 January to 1 June inclusive
- To avoid potential negative impacts on foraging bees, do not spray during the peak of the flowering season wherever possible.

Commentary

Iwi management plans for the Canterbury region seek to encourage alternative means of vegetation control to agrichemicals. Consideration should be given to alternatives to spraying aquatic weeds including hand or mechanical clearance. Further long-term weed control measures should be considered and implemented where practicable, including shading and nutrient management and encouraging indigenous species such as raupo.

4 CERTIFICATION OF WORK PLANS

This section details the information requirements and process for obtaining Environment Canterbury certification that proposed work plans are in accordance with this Code of Practice.

The certification process is required for works that would otherwise require resource consent under Section 13(1) of the Resource Management Act 1991 and the person undertaking those works is seeking to be able to do so as a permitted activity under Rule 5.138 of the Land & Water Regional Plan.

The activities listed in section 3 of this Code of Practice include activities and work types that would not otherwise require resource consent under section 13(1) of the Resource Management Act (for example, fencing and flood pumping). Such works have been included in this Code because they form a significant element of Environment Canterbury's flood-protection routine maintenance works and the activity-specific requirements provide a good practice baseline for these activities. Certification of work plans for these activities – those that would not otherwise require resource consent – is not necessary to undertake the works.

Certification that work plans are in accordance with this Code of Practice is only one element of Rule 5.138. If the other conditions of Rule 5.138 cannot be met, resource consent will be required. The conditions of any resource consent will take precedence over the requirements of this Code of Practice.

The requirements of this Code of Practice set out what must be achieved, work plans must set out how these requirements will be achieved. Work plans need to clearly demonstrate how the general requirements and work type requirements will be met.

4.1 Certification of annual work plans or operational work plans

Many of the activities undertaken to manage defences against water are able to be planned in advance because they are either routine maintenance works that occur at regular intervals (such as seasonally based activities) or they are specific known activities that are undertaken in response to flood events. For example, it may not be known if damage to an asset will occur in any given year, but the kind of activities known to be needed to repair that damage can be planned for in advance should they need to be carried out.

To avoid the need for multiple applications for certification of work plans, Environment Canterbury encourages users to submit annual (or up to three yearly) work plans for their scheme maintenance and flood repair activities.

Where users have documented standard work practices or operational and maintenance plans that detail the measures to be used which are already in accordance with this Code of Practice, such documentation may be submitted to Environment Canterbury for certification (meaning it may not be necessary

to prepare a separate document for certification purposes). If Environment Canterbury determines the work practices are in accordance with the Code of Practice, Environment Canterbury will provide written confirmation to that effect. Such confirmation will specify the measures provided in the submitted documentation are determined to be in accordance with this Code of Practice and the certification is not an endorsement of all aspects of the documentation (meaning it is not certifying the appropriateness of the overall operational or maintenance plan).

Timeframe for submitting annual work plans

Applicants seeking certification of annual (or up to three yearly) work plans under this Code of Practice are encouraged to submit work plans no later than 31 May in each calendar year. Work plans submitted by this deadline will be processed and outcomes advised to the applicant by 30 June.

Work plans submitted outside this timeframe will be assessed and determined on a case-by-case basis.

4.2 Certification of job specific work plans

An alternative to creating a plan for the year, or several years, of maintenance or reactive repair works, is to create a work plan specific for jobs as they arise.

Timeframe for submitting job specific work plans

Certification for job specific work plans may be submitted at any time of the year. If possible, work plans should be submitted no later than 10 working days prior to the proposed start date for the job. If the certification is required to carry out work to urgently repair flood damage, please submit the plan as soon as possible before works start and we will make a decision on certification of the plan within two working days.

4.3 Information to be submitted

Work plans requiring certification submitted to Environment Canterbury shall contain *all* of the following information:

- The local authority or network utility operator for which the work is being undertaken
- For the person responsible for overseeing the work, name and contact details including, as a minimum, email and mobile phone number
- Location of the proposed work, including watercourse name, topographical plan showing location of the proposed works and map grid reference
- Details of the proposed works including, as a minimum:
 - Scope and extent of proposed works
 - Reason for works being undertaken
 - Timing, duration and frequency of proposed works
 - How the worksite will be accessed
 - Sediment and erosion control measures where applicable
 - Methods to be used to manage potential environmental effects
 - Identification of the relevant provisions of this Code of Practice and confirmation these measures will be complied with during the proposed works
 - Methods to be used to manage potential environmental

effects. This means a detailed works methodology that sets out how the requirements of Part 2 and Section 3.2 of the Code of practice will be met.

Appendix A contains an optional template form for submittal of this information.

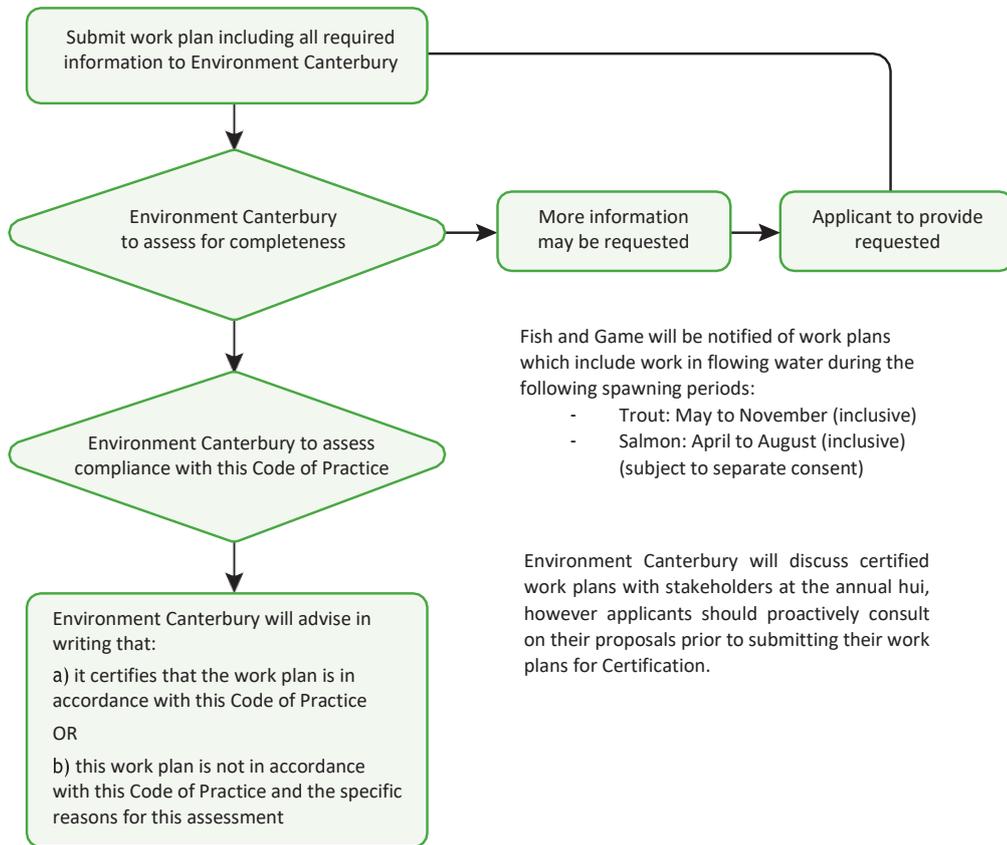
4.4 Certification process

The certification process is a non-statutory process undertaken by the River Engineering section of Environment Canterbury.

The process certifies the work plan is in accordance with this Code of Practice. Conditions are not able to be imposed on the work plan via the certification process.

The process for certification is set out in the following diagram.

Certification process



4.5 Duration of certification

The duration of certification will typically match the duration applied for as long as it is three years or less:

- If the application documentation is based on standard work instructions or operational/maintenance plans, certification duration shall typically be three years
- If the application documentation is based on an annual work plan, duration will typically be one year
- If the application documentation is based on a single activity, the certification duration will typically be of sufficient length to enable the activity to occur in favourable conditions. Certification for up to three years may be obtained to allow for ongoing maintenance activities for defences against water.

4.6 Fees

Environment Canterbury may, by using the consultative procedure in section 83 of the Local Government Act 2002, prescribe any fee payable by any person who applies for certification of work plans under this Code of Practice. Environment Canterbury may, in its

absolute discretion, refund, remit or waive the whole or part of such fee.

4.7 Flood Protection and Drainage Bylaw approval

Certification under the Code of Practice does not replace the requirements for approval under the Flood Protection and Drainage Bylaw. Requests for approvals under the Flood Protection and Drainage Bylaw and certification of work plans under this Code of Practice may be made concurrently to Environment Canterbury.

4.8 What does certification mean?

The certification process only confirms that the work plan presented has been prepared taking into account the relevant provisions of this Code of Practice. Certification of work plans **does not:**

- Confirm the works are a permitted activity. Certification of the work plan is a requirement of one of the conditions of 5.138, all other conditions need to be met to meet permitted activity

- Provide any comment or approval of the design or construction standards of the proposed works in terms of their functionality or necessity
- Provide any other statutory approvals or rights to access land for the proposed works
- Provide any approval or comment on proposed measures to address health and safety issues or hazards associated with the proposed works

5 MONITORING AND REVIEW

5.1 Monitoring of work practices

Work practices certified under this Code of Practice may be undertaken as permitted activities under Rule 5.138 of the proposed Land & Water Regional Plan, subject to meeting the other conditions of Rule 5.138.

Any work plans certified as being in accordance with the Code of Practice will be provided to Compliance Monitoring staff of Environment Canterbury to inform and assist their undertaking of permitted activity monitoring and enforcement activities under the Resource Management Act.

5.2 Review of Code of Practice

This Code of Practice will need to be updated as work practices are improved, there are changes in the requirements for installing, maintaining, using or removing defences against water, or requirements need to be amended to address differing expectations or regulations.

To ensure that this Code of Practice remains current and the objectives set out in Section 1 are met, reviews of the Code of Practice will be periodically undertaken by Environment Canterbury. Given the Code of Practice is referenced in the Land and Water Regional Plan, any changes made to the Code of Practice will be made at the same time as the Canterbury Regional Council notified a review or change to the Land and Water Regional Plan.

As such, the frequency of formal updates cannot be prescribed but it is expected the review will occur approximately every three years.

The review will include:

- A review of plans certified under this Code of Practice since the previous review, including any environmental incidents and monitoring or enforcement action undertaken
- Feedback from Ngāi Tahu
- Comment from user groups (local authorities and network utility operators)
- Comment from interested or affected parties (for example, the Department of Conservation and Fish & Game)
- Consideration of any changes to good practice procedures and/or requirements informed by any statutory or regulatory changes since the previous review and expertise within the river engineering and science sections of Environment Canterbury
- Consideration of the extent to which the Code has been effective in meeting the objectives set out in Section 1
- Identification of recommended changes to address any issues raised.

6 USEFUL LINKS AND GUIDANCE DOCUMENTS

The following documents have been referred to throughout this Code of Practice and provide additional guidance and information:

- **Land & Water Regional Plan**, Canterbury Regional Council. Available on Environment Canterbury's website: www.ecan.govt.nz
- **Resource Management Act 1991**. (And as updated by subsequent amendments). Available at: www.legislation.govt.nz
- **Canterbury Water Management Strategy**. Available on Environment Canterbury's website: www.ecan.govt.nz
- **Flood Protection and Drainage Bylaw 2013**. Available on Environment Canterbury's website: www.ecan.govt.nz
- **Statutory Acknowledgement Areas under the Ngāi Tahu Claims Settlement Act**. The list of areas is included in Schedule 19 of the Land & Water Regional Plan. The areas are also mapped on www.canterburymaps.govt.nz. These areas are not default layers on the Canterbury Maps tool. They need to be added to the individual user's viewer to become visible. Refer to the help guide at www.canterburymaps.govt.nz under "Adding other Canterbury Maps Layer"
- **River Flow Information**. This can be obtained from Environment Canterbury's website: www.ecan.govt.nz
- **Canterbury Maps**. This mapping tool is available at www.canterburymaps.govt.nz and includes layers that will help planning works and identifying significant sites
- **New Zealand Freshwater Fish Database and the IUCN Red List**. These sites can be used to check for the likely presence of rare or endangered fish at proposed worksites. See: www.niwa.co.nz and www.iucnredlist.org
- **Heritage New Zealand Pouhere Taonga Act 2014**. Available at: www.legislation.govt.nz
- **Heritage New Zealand Pouhere Taonga**. Information about archaeological and heritage sites: www.heritage.org.nz
- **Biosecurity New Zealand's Hygiene Procedures**. See: www.biosecurity.govt.nz
- **Erosion and Sediment Control Toolbox for Canterbury**. See: www.esccanterbury.co.nz
- **Waterways, Wetlands and Drainage Guide, Christchurch City Council**. Available on Christchurch City Council's website: www.ccc.govt.nz
- **New Zealand Fish Passage Guidelines for structures under 4m**. Available on the NIWA website: www.niwa.co.nz
- **Biodiversity New Zealand Unwanted Organisms Register**. Available at www.biosecurity.govt.nz
- **Fish Salvage Guidelines**. Available at: www.ecan.govt.nz
- **Natural Character Assessment tool**. Available at: www.ecan.govt.nz
- **Selwyn-Waiora – A Guide for Managing Your Drains**, Waihora Ellesmere Trust. Available at: www.wet.org.nz/projects/sustainable-drain-management-project/

Additional relevant rules to review from the Land and Water Regional Plan:

- Vegetation Clearance see *rule* 5.163 and 5.164
- Agrichemical use see *rules* 5.22 and 5.23
- Installation of pipes, cables, wires see *rules* 5.135 and 5.136
- Installation of permanent or temporary bridges and culverts see *rule* 5.137

APPENDIX A: WORK PLAN TEMPLATE (OPTIONAL)

Local authority
or network utility operator: _____

Contact person:

Name: _____

Position: _____

Address: _____

Phone: _____

Email: _____

Proposed worksite:

Location: _____

Watercourse: _____

NZMS map grid: _____

Locality Plan Attached

Proposed work details:

Scope and extent of work: _____

Reason for work being undertaken: _____

Timing, duration and frequency of works: _____

I attach a site plan and methodology which details site access, sediment and erosion control methods, and proposed methods to avoid, remedy or mitigate potential adverse effects.

In addition to the General Requirements of the Code of Practice for Defences against Water and Drainage Schemes, the following work-type requirements are relevant and the necessary requirements will be complied with:

I also require approval under the Flood Protection and Drainage Bylaw 2013. An application for bylaw approval is:

- Attached
- To be submitted at a later date but before undertaking works

Name: _____ Date: _____

Signature: _____

APPENDIX B: STANDARD FORMS (OPTIONAL)

Date of find: / /

Location: _____

Map Reference: NZMS 260: _____

Details of find e.g. human remains/tools/ animal remains

Has work stopped?:	Yes/No
Was a Site Assessment form completed for the work?	Yes/No
Was consultation undertaken with:	Rūnanga Yes/No
	Heritage New Zealand Yes/No
	Police Yes/No

Rūnanga/Heritage New Zealand/Police notified: _____

Date notified: / /

Details of conversation

Process to follow:

- 1)
- 2)
- 3)
- 4)
- 5)

Other details

Reported by: _____

Date: _____

Details of adverse environmental effect

Interested parties notified:

- 1)
- 2)
- 3)
- 4)

Procedure undertaken

Corrective action required? Yes/No

Operator name(s): _____

Date: / /

Start and finish time of application: _____

Location: _____

Target plants: _____

Chemicals used: _____ Manufacturer: _____

Mixing rate: _____

Additives used: _____ Manufacturer: _____

Mixing rate: _____

Locations where mixing carried out: _____

Application method: _____

Any water-quality monitoring carried out? Yes/No

Location of water-quality monitoring sites: _____

Water quality monitoring results: _____

Estimated wind speed and direction: _____

Weather conditions: _____

Rain (start/finish time): _____

Ground conditions: _____

Other

Environment Canterbury offices

Christchurch
200 Tuam Street
PO Box 345
Christchurch 8140

P 03 365 3828
F 03 365 3194

Timaru
75 Church Street
PO Box 550
Timaru 7940

P 03 687 7800
F 03 687 7808

Kaikōura
96 West End
PO Box 59
Kaikōura 7340

P 03 319 5781
F 03 319 5809

Report number: R19/33
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