Guidelines for Undertaking Works

The following sets out the guidelines that will be adhered to for each of the types of activities included in this application. These guidelines have been taken from the relevant sections of the BOPRC Environmental Code of Practice for Rivers and Drainage Maintenance Activities. The guidelines will form the basis for the development of the management plan which is required for each works activity carried out under the consent.

RIPARIAN EARTHWORKS

- Always use suitable machinery (such as a hydraulic excavator) to minimise the risk of depositing sediment into the watercourse.
- Always use an experienced / trained machinery operator
- Do not carry out excavations or earthworks below the waterline, unless it is necessary to provide for bank stability.
- Always pull material away from the watercourse
- Revegetate exposed areas to control surface erosion as soon as practicable following completion of earthworks disturbance
- Fence the exposed area to exclude stock until ground surface is stabilised
- Follow-up ground cover planting with shrub and tree vegetation on the stream margins.

CHANNEL MAINTENANCE

- Avoid machinery entering water unless necessary to undertake the works.
- When carrying out instream works, use appropriate machinery to ensure the work can be completed as efficiently as possible, with minimum track movement and/or pushing of material within flowing water.
- Avoid operations during bird nesting seasons where habitats have been identified.
- Avoid instream works during low flow conditions and fish spawning/migration seasons where practicable.
- Ensure that machinery is removed from floodable areas at the end of each working day or when the site is left unattended.
- Ensure that no refuelling or storage of fuel occurs in a location where a spill could enter a water body.
- Deposit sediment removed from river and stream beds well away from the channel edge. Stockpile or spread the material in consultation with the landowner.
- Avoid instream works during de-armouring by maintaining a setback distance of at least 1m from the wet bed of the watercourse.
- Ensure that gravel ripping remains at least 0.3m above the water table at the site.
- Windrowing of material should be undertaken in a manner that does not prevent access by 4WD vehicles.
- Excess vegetation should be disposed off-site where practicable, and not placed where it could readily enter the watercourse.
- Existing access tracks should be left undisturbed or reinstated on completion of the works.
- Ensure that machinery is removed from floodable areas at the end of each working day or when the site is left unattended.
- Ensure that no refuelling or storage of fuel occurs in a location where a spill could enter a water body.

- At the completion of works there should be no depressions that may trap fish during higher flow conditions.

VEGETATION CLEARANCE IN RIPARIAN AREAS

- Ensure that trees are layered where practicable at an age of 8-10 years, or up to 300mm trunk diameter.
- To avoid layered trees being swept away in floods, ensure that a minimum connection of 25% of the tree diameter remains attached to the stump once the tree is felled.
- Where less than 25 of the tree diameter is attached, ensure the tree is anchored to the main stump with heavy tie plastic, wire rope or similar effective attachment.
- Ensure that trees over 300mm diameter are layered by utilising a safety device and/or mechanical assistance
- When removing trees from streams/rivers, use the appropriate machinery which ensures that there is minimal damage to the stream and river banks.
- Stockpiled slash and debris shall be located clear of flowing waterways, overland flow paths and planted buffer zones.

PLANTING ON BANKS AND IN THE BED OF RIVERS AND STREAMS

- Establish plantings (particularly protective ground cover) as soon as practicable following completion of works.
- Plant specialised willow and poplar species as edge protection immediately adjacent to a harsh river / high energy environment (do not use crack willow for new plantings).
- Avoid planting in sites where the plant material may cause a navigation hazard
- Use specially bred willow/poplar material that will not spread by seed, and will not be prone to breakage, if the plant material is available.
- Plant pioneer native shrub species (including flax – harakeke) inland from the primary willow plantings, to provide protective vegetation with minimal maintenance requirements
- Always use trained staff for carrying out planting operations
- Use locally sourced native plant material wherever possible.
- Liaise with Department of Conservation where appropriate to identify suitable native species.
- Plant exotic protection / production species further inland from the protection planting, if there is sufficient space available.
- Avoid introducing exotic species into sites with high ecological values.
- Species planted for potential production purposes should be located so that harvesting operations can be undertaken with minimal environmental effects, including no discharge of sediment or debris into the watercourse.
- Fence the protection plantings to exclude stock.
- Control animal and plant pests.
- Set planting spaces carefully to achieve a multi-layered canopy of ground cover / shrubs / trees in the long term, with reduced opportunities for weeds to flourish.
- In wetter areas, plant appropriate species that are adapted to wet conditions (flax, cabbage tree etc).
- On smaller streams, avoid the possibility of choking the stream, by planting above the flood level of dominant flow (theoretical channel forming flood).
- Avoid use of willows if practicable, in small streams and rivers with low gradients.

PLACING AND USING EROSION PROTECTION STRUCTURES IN THE BED OF RIVERS AND STREAMS

- Ensure all works are carried out in a manner that minimises the operation of machinery within the flowing river channel.
- Ensure that no refuelling or storage of fuel occurs in a location where a spill could enter a water body.
- Ensure that excavation and trenching operations are carried out in a manner that minimises the possibility of sediment entering water bodies.
- Consider the potential for the works to cause a navigational hazard.
- Only use Crack Willow material where there is no suitable alternatives and Crack Willow is already present in the vicinity of the works site.
- Ensure all material is securely anchored to prevent any material breaking free and washing downstream.
- Ensure that machinery and materials are removed from the floodway at the end of each working day to avoid the possibility of floodwaters washing machinery or materials downstream.
- Ensure that all exposed ground is regressed and/or effectively stabilised to control surface erosion, as soon as practicable following completion of the works.
- Rock should be placed on a specified design slope
- Rock may require engineering design, including size, grading, shape and quality (soundness, resistance to both abrasion and weathering) specifications. This will ensure that is remains in situ and fulfils its design function.
- Rock should be placed using appropriate machinery unless otherwise specified.
- The rock used should be clean quarry spalls ex-face or other suitable rock material, which is free of soil, mud, clay or other soluble debris.
- If concrete is used instead of rock, it should be clean, stable material, not readily broken down, and free of iron, steel, soil, mud, clay, contaminants, or any soluble material.
- Well designed and placed rock rip rap will settle as the channel stabilises. The rock material may require maintenance by topping up with additional rock to ensure that it fulfils its designed purpose. This should only be required once.
- Always carry out protection planting as follow up works.

STREAM MOUTH CLEARANCE AND RE-ALIGNMENT

- Ensure all works are carried out in a manner that minimises the operation of machinery below mean high water springs.
- Ensure that no refuelling or storage of fuel occurs within 20m of the coastal marine area or in a location where a spill could enter a water body.
- Ensure that excavation and trenching operations are carried out in a manner that minimises the possibility of sediment entering water bodies.
- Ensure that any stockpiled sand is either deposited in the redundant channel or on the adjacent beach taking care to spread the material so as to maintain a natural beach profile.
- Debris removed from watercourses should be stockpiled outside the coastal marine area.