

Highway Maintenance Specification Sections

2.280 Engineered Wetland and Water Quality Pond Maintenance

Available at:

http://www.th.gov.bc.ca/BCHighways/contracts/maintenance/Schedule_21_Maintenance_Specifications.pdf

5.8 Engineered Wetland and Water Quality Pond Management

Engineered wetland and water quality pond management activities include the hand and machine removal of debris from pond inlets and outlets and the repair and replacement of drainage appliances to allow settling of suspended sediments from road runoff and filtering of road runoff prior to discharge downstream.



Environmental Issues

Primary environmental issues relating to routine engineered wetland and water quality pond management activities are summarized in the following table. It should be noted that site-specific conditions might present additional issues you will need to address in planning and undertaking your works.

Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Cleaning and Debris Removal	May introduce sediment or other deleterious substances to a watercourse through sediment and debris removal activities	No release of any substance that could be deleterious (toxic) to fish or fish habitat (<i>Fisheries Act</i> , Sections 34(1) and 36(3)).
	May damage roadside riparian vegetation or other significant habitats through the side casting of accumulated sediment	No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act</i> , Section 35(1)). No alteration of a stream unless authorized by an approval, licence, or order (<i>Water Act</i> , Section 9), or through a Notification (<i>Water Act Regulation</i> , Part 7).
	May damage habitat through the improper location of sediment and debris disposal sites in ditches, wetlands, or other significant habitat areas	No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act</i> , Section 35(1)). No alteration of a stream unless authorized by an approval, licence, or order (<i>Water Act</i> , Section 9), or through a Notification (<i>Water Act Regulation</i> , Part 7). No alteration or destruction of a protected species' residence without approval (<i>Species at Risk Act</i> , Sections 32(1), 33).

Engineered Wetland and Water Quality Pond Management

Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Cleaning and Debris Removal	May promote the establishment of invasive plants onsite through the creation of disturbed soils and may spread invasive plants through the relocation of plants and soils containing invasive plant seeds.	No dispersal of noxious weeds or their seeds (<i>Weed Control Act</i> , Weed Control Regulation).
Repair Works	May release deleterious substances (sediment, cement-based products, epoxies, sealants) to a watercourse through repair works to drainage appliances	No release of any substance that could be deleterious (toxic) to fish or fish habitat (<i>Fisheries Act</i> , Sections 34(1) and 36(3)). Deleterious substances include, but are not limited to, gasoline, oils, paints, sealants, concrete leachate, and sediment.
	May contaminate surface waters, groundwater, and soils through improper storage or disposal of materials used in repair works (e.g., concrete, sealants, epoxies)	Reporting of any polluting substance spills (<i>Environmental Management Act</i> , Section 79(5)) and disposal of all waste materials in accordance with the Act (<i>Environmental Management Act</i> , Waste Disposal Regulation).
Replacement of Drainage Appliances	May damage habitat by altering instream and bank structures and vegetation through the removal of existing drainage appliances and replacement activities	No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act</i> , Section 35(1)). No alteration of a stream unless authorized by an approval, licence, or order (<i>Water Act</i> , Section 9), or through a Notification (<i>Water Act</i> Regulation, Part 7). No alteration or destruction of a protected species' residence without approval (<i>Species at Risk Act</i> , Sections 32(1), 33).
Placement of Riprap	May release deleterious substances (sediment, cement-based products, epoxies, sealants) to a watercourse through replacement activities	No release of any substance that could be deleterious (toxic) to fish or fish habitat (<i>Fisheries Act</i> , Sections 34(1) and 36(3)). Deleterious substances include, but are not limited to, gasoline, oils, concrete leachate, and sediment. Reporting of any polluting substance spills (<i>Environmental Management Act</i> , Section 79(5)) and disposal of all waste materials in accordance with the Act (<i>Environmental Management Act</i> , Waste Disposal Regulation).
	May introduce sediment or other deleterious substances to a watercourse through site preparation for riprap placement or the placement of silt-laden or acid-rock riprap materials	No release of any substance that could be deleterious (toxic) to fish or fish habitat (<i>Fisheries Act</i> , Sections 34(1) and 36(3)). Deleterious substances include, but are not limited to, gasoline, oils, sediment, and acid-rock leachate.



Environmental Best Practices

The following BPs have been compiled for routine maintenance works that do not require a *Water Act* Notification or further approvals from regulatory agencies (i.e., works on engineered wetlands and water quality ponds that are non-fish bearing and disconnected from fish-bearing channels). Should your works require a *Water Act* Notification

Engineered Wetland and Water Quality Pond Management

or DFO authorization (i.e., works on a watercourse that contain fish and other aquatic species or fish habitat), more detailed BPs will be provided to you by the regulatory agency in response to your application.

The BPs in this document are provided as guidelines to help you ensure your works are completed in compliance with the performance standards and environmental legislation. Please note that the general BPs apply for most work activities within this category; if BPs specific to the activity are available they are also noted below.

Regulatory Agency Contact

- Prior to beginning your engineered wetland and water quality pond management activities, identify any areas that may be of particular concern (sensitive habitat areas) found within your work area.
- Determine how much impact your required works will have on the identified areas. Is your engineered wetland or water quality pond occupied or accessible to fish? Are you removing a small debris pile from the pond inlet by hand or a large volume of accumulated sediment using an excavator? Will you be using cement-based materials or other potentially deleterious substances to repair a drainage appliance? Will your work sites be easy to isolate from flow? By asking these questions, you should be able to identify any planned works or areas that may be of concern to regulatory agencies.
- Meet with the appropriate regulatory agency contact, as listed in Section 8, to discuss site-specific environmental protection measures. Refer to Section 7 for information on the Memorandum of Understanding with MoE, and the recommended protocol for maintaining regular communications with regulatory agencies.

Timing of Works

For most work activities within this category, the following general BPs apply:

- Works are preferably undertaken during periods of dry weather (e.g., summer) as this allows easier control of sediment. Typically this is also a less sensitive period for fish and wildlife than other seasons. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances.

Site Management

- Minimize disturbance to areas surrounding the worksite and avoid impacts to surrounding trees and shrubs when preparing your worksite and undertaking your maintenance works.
- Identify areas containing invasive plants. Wetlands provide prime locations for the accumulation of water-borne invasive plant seeds and soils or debris should be managed with care.

Engineered Wetland and Water Quality Pond Management

- Apply native grass and ground cover seed mixes to exposed soils to reduce the risk of invasive plant establishment.

Equipment Use

- Ensure all equipment used on site is well maintained and free of fluid leaks. Refuel and lubricate equipment on dry land away from watercourses. Use drip trays to contain any spillage during equipment maintenance.

Worksite Isolation

- Isolate your work area from any flowing water that may be present. Ensure any flows are temporarily diverted around the wetland or pond.
- Contain any sediment-laden water generated during your works within your isolated work cell. Allow any generated sediment time to settle from the water column and ensure that water discharging from the pond is clear and free of sediment.

Waste and Materials Containment

- Have a spill response plan in place and spill kits on site.
- Use clean materials, free of fine soils that may contribute sediment to the watercourse, when installing riprap or other bank erosion protection measures.
- If potentially deleterious materials (e.g., cement-based products) are used for repair works, ensure raw material and wash water will not be released to any watercourse.
- Where possible, sweep up loose material or debris. Any material thought to pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site. Any clean surplus material should be removed to an area where it will not enter any watercourse, ditch, or channel.
- Dispose of excess materials, excavated soils, and removed debris away from any watercourse. Ensure that the material is placed in such a manner as to prevent its future introduction into any watercourse by installing silt fencing, seeding, or using similar sediment control BPs.
- Ensure excavated material containing invasive plant material is treated and disposed of properly.

Erosion and Sediment Control

- If excavated materials or any other erodible materials are to be left on site, ensure they are placed in a manner that will prevent the introduction of sediment to any watercourse (i.e., temporary covers, grading and seeding, installation of silt fence around spoil piles).

Engineered Wetland and Water Quality Pond Management

- Install appropriate erosion and sediment control devices (e.g., silt fence installed below disturbed slopes, rock check dams and temporary silt dikes in low velocity, low volume outflow ditches) to prevent the transportation of sediment from your work area to downstream watercourses. Ensure that any structures installed are maintained and monitored until they are no longer needed (i.e., vegetative cover on seeded areas is adequate to control erosion).



Key Information Sources

The documents and websites listed below are recommended resources for engineered wetland and water quality pond management activities. They can provide examples of existing protocols and management strategies, as well as additional information on specific operational BPs (e.g., erosion and sediment control techniques).

MoT Technical Circulars:

There are no relevant Technical Circulars authored to-date for this activity.

All Technical Circulars are available at:

http://www.th.gov.bc.ca/Publications/Circulars/Current_technical.asp

Locally Developed BPs

(Provide any locally-developed BPs):

-
-
-

Other Resources:

Pond and Wetland Replacement Fact Sheet. 2000. Environmental Management Section, Engineering Branch. Ministry of Transportation. http://www.th.gov.bc.ca/publications/eng_publications/environment/references/Ponds_and_Wetlands_Fact_Sheet.pdf

Manual of Control of Erosion and Shallow Slope Movement. August 1997. BC Ministry of Transportation. http://www.th.gov.bc.ca/Publications/eng_publications/environment/references/Man_Control_Erosion.pdf

T.I.P.S.: Targeted Invasive Plant Solutions. Invasive Plant Council of British Columbia. 2008. <http://www.invasiveplantcouncilbc.ca/resources/targeted-invasive-plant-solutions-tips>

Case Study: Engineered Wetlands – Inland Island Highway. Stewardship Centre for British Columbia website. http://dev.stewardshipcanada.ca/caseStudies/NSCCs_builder.asp?request_no=147

Engineered Wetland and Water Quality Pond Management

Standards and Best Practices For Instream Works. March 2004. Ministry of Water, Land and Air Protection.

<http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>

Catalogue of Stormwater Best Management Practices. September 2005. Idaho Department of Environmental Quality.

http://www.deq.state.id.us/water/data_reports/storm_water/catalog/index.cfm



Checklist for Environmental Protection Requirements

- Is your proposed work considered a “routine” maintenance activity? If not, approvals or permits may be required. Contact your local municipal, provincial, or federal regulatory agency staff.
- Has this project been discussed with local environmental regulatory staff? In addition to the BP information presented, other site-specific conditions may apply.
- Have site-specific environmental protection requirements been identified? List below:
 - _____
 - _____
 - _____
 - _____