



Chapter 8: Environmental Guidelines for Construction and Maintenance of Wharves, Breakwaters, Slipways, and Boathouses



**Water Resources Management Division
Water Rights, Investigations, and
Modelling Section
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Chapter 8

Environmental Guidelines For

CONSTRUCTION AND MAINTENANCE OF WHARVES, BREAKWATERS, SLIPWAYS, AND BOATHOUSES

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8.0 WHARVES, BREAKWATERS, SLIPWAYS, AND BOATHOUSES

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8.0 WHARVES, BREAKWATERS, SLIPWAYS, AND BOATHOUSES

8.1 General

Wharves, breakwaters, slipways and boathouses are all marine structures used for various recreational and commercial purposes. Wharves (docks and piers) are structures located on the shore and can be used for swimming, fishing or for securing boats; breakwaters protect the shore line from wave action and coastal erosion; slipways are ramps that aid in moving boats in and out of the water; and boathouses are built along the shoreline to store boats or other related items.

When it comes to these structures, the main environmental consideration in their construction and design is that they do not affect the water quality; cause loss to fish or other wildlife habitat; adversely affect the environment or impede the passage of fish and ice; movement of water and waves; or cause erosion and sedimentation of shorelines or banks.

These guidelines offer the reader an understanding of important environmental and construction considerations when undertaking the altering of a body of water with a structure such as a wharf/dock, breakwater, slipway or boathouse.

8.1.1 Regulations and Regulatory Bodies

Section 48 of the [Water Resources Act](#) states that permits are required for any works in or adjacent to a body of water. Permits are required under the Act for the construction and maintenance of wharves, breakwaters, slipways and boathouses and must be completed in accordance with these guidelines.

The proponent may require approvals from other agencies prior to constructing a wharf, breakwater, slipway or boathouse. Approvals may be required from the following:

- The Municipality
 - For projects within municipal boundaries
- Department of Environment and Conservation
 - Crown Lands Administration Division - Lands Act
 - Water Resources Management Division - for work in Protected Water Supply Areas
 - Environmental Assessment Division - Environmental Protection Act
- Department of Fisheries & Oceans, Habitat Management Division
 - Fish Habitat (Fisheries Act)
 - Species at Risk Act

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- Canadian Coast Guard
 - Construction in Navigable Waters (wharves, dredging etc.)

8.2 Guidelines

8.2.1 Wharf/Dock

There are various types of wharf or dock structures, such as:

- Floating
- Pipe/Pile
- Cribbed
- Concrete Piers; and,
- Cantilever or suspension

Of these structures, cantilevered docks, docks supported on posts, pipes or piles, and floating docks such as seen in **Figure 8.1** are least likely to have an adverse environmental effect. The pushing or placement of materials into the water and placement of decking on top is not considered a wharf. Material used for ballast should be cribbed and armor stone placed around cribbing, where required to prevent erosion.



Figure 8.1 A wooden floating dock in a small harbour

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8.2.2 Breakwater

Breakwaters are structures composed of various rock or concrete material placed in the water to protect coastal erosion. They can be of various shapes and sizes but should be professionally engineered for maximum efficiency, longevity and environmental consideration. The most common are rubble mound breakwaters. **Figure 8.2** shows a breakwater constructed from wood in order to prevent coastal erosion as well as protect boats docked in a harbor from large waves.



Figure 8.2 A wooden breakwater protects boats docked in a harbour

8.2.3 Slipway/Boat Launch

Construction of a boat launch ramp / slipway should be done in a manner that minimizes the amount of excavation required hence reducing the risk of sediment entering the watercourse. A boat launch or slipway may be constructed with untreated wood, clean gravel/stone or concrete and should be stabilized. All material used should be clean, good quality material, free of metals, organics or other chemicals that may be harmful to receiving waters.

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8.3 Maintenance and Removal

8.3.1 General Maintenance

General maintenance work should be carried out as required from time to time. Grouting or resurfacing of structural components as well as the removal of debris which may become caught at piers or locations upstream of marine structure will extend its useful life and minimize the risk of structural failure.

Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.

The owners of structures are responsible for any environmental damage resulting from dislodgement caused by the wind, wave, ice action, or structural failure.

8.3.2 Removal

These guidelines should be followed during the removal of these structures. As with their construction and installation, care should be taken to prevent any adverse environmental effects on the surrounding water body.

8.3.3 Site Restoration

Any areas adversely affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of the Department.

The bed, banks and floodplains of watercourses, or other vulnerable areas affected by this project, must be adequately protected from erosion by seeding, sodding or placing of rip-rap.

All waste materials resulting from this project must be disposed of at a site approved by the regional Government Service Center of the Department of Government Services. The Department of Government Services may require samples to be submitted for testing and analysis.

8.4 Preconstruction Preparation

All work must take place within the proponent's legal boundaries or with the approval of the land owner. The constructed work must comply with all other terms and conditions provided in the Crown Lands grant, lease or license for occupancy.

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Suitable booms must be deployed around construction sites to contain any floating debris that might otherwise be carried away. All booms must be properly maintained and remain in place until all work is completed.

Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.

8.4.1 Scheduling

Proper scheduling of work is an important consideration in the implementation stage of an undertaking and is important from the standpoint of fish habitat protection and the environment. It can also be economically advantageous as well.

The Department recommends that construction near a body of water take place:

- During low flow (easier to restore bank vegetation and sediments will carry slower and settle out quicker); and
- At periods of low rainfall (reduces the chance of erosion and overland runoff).

These conditions generally would occur between June 1st and October 30th. The Department of Fisheries and Oceans (DFO) should be contacted to determine any restrictions to the construction season with regards to protection of fish and fish habitat.

8.5 Construction Practices/Procedures

All operations must be carried out in a manner that prevents damage to land, vegetation, and prevents the pollution of bodies of water. The construction of marine structures has the potential to cause environmental damage and create problems with respect to siltation, pollution, erosion and deposition. Many of these problems occur during the construction phase of work and are often the result of poorly executed construction procedures. These problems can be mitigated or prevented by following preferred construction procedures and techniques. Detailed information on construction practices can be found in *Chapter 10, “General Construction Practices”* (Located on the Department’s website).

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8.5.1 Equipment Operation

All vehicles and equipment working near a body of water must be clean and in good repair, free of mud and oil or other harmful substances that could impair water quality.

The use of heavy equipment in streams or bodies of water is not permitted. Heavy equipment must be kept outside the high-water mark of all drainage courses and bodies of water. The operation of all heavy equipment must be confined to dry, stable areas to reduce production of mud and silt laden water.

Suitable measures must be taken to prevent or reduce the generation of silted or muddied water from the operation of heavy equipment. High traffic areas must be kept well drained to prevent the formation of mud puddles which can contribute to siltation.

Water pumped from excavations for work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the environmental regulations.

8.5.2 Use of Concrete near a Body of Water

Where cast-in-place concrete is required, all fresh concrete must be kept from coming in contact with the watercourse until adequate curing is achieved. The formwork must be constructed with tight joints to prevent leakage and all necessary precautions taken to prevent spillage of concrete in or near a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.

8.5.3 Use of Wood Preservatives

The use of creosote treated wood is strictly prohibited within 15 meters of all bodies of fresh water in the province and strongly discourage in other water bodies. Before using any creosote treated wood, the proponent should contact the Department's Water Resources Management Division.

Wood preservatives such as penta, CCA (chromated copper arsenate) or other such chemicals must not be applied to timber near a body of water. All treated wood or timber must be thoroughly dry before being brought to any work site and installed. Untreated wood is ideal from a water quality perspective and, if submerged completely underwater, will last indefinitely. Some wood, such as cedar, contain natural preservatives and is an excellent material for building wharves or piers.

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Please note, there are additional restrictions on use of treated wood in Protected Water Supply Areas and a permit is required for all work activities in these areas.

8.5.4 On-Site Use of Petroleum Products or Hazardous Substances

The proposed use of any facility and site must not involve any storage of pollutants such as chemicals, pesticides etc. The storage and handling of gasoline and any petroleum derivative must be carried out according to *The Storage and Handling of Gasoline and Associated Products Regulations*, 1982.

8.5.5 Other Materials

Recycled materials such as old metal, plastic drums or tires are not encouraged to be used as construction materials. They may contain substances which can affect water quality and be harmful to aquatic life.

For floating docks, wharves or piers, non-recycled plastics provide excellent flotation, are inert and are durable in the water. Styrofoam also provides excellent flotation, is relatively stable in the water but may break apart. If it is used, it must be enclosed; it is a potential hazard to fish if mistaken for food.

Any fill or ballast material must be of good quality, free of fines or other substances including metals, organics or chemicals that may be harmful to the receiving waters.

8.5.6 Bank Disturbance

At all times, every necessary precaution should be taken to prevent the disturbance of channel banks, bank vegetation and land within the high water mark, flood zone or 15m environmental buffer of any body of water. A minimum 15 meter wide vegetated buffer zone must be maintained along the edge of the water body in order to provide bank stability and maintain local aesthetics.