

Controlled activities – Guidelines for outlet structures on waterfront land

These guidelines relate to the design of stormwater outlets and spillways from infrastructure including roads, buildings, constructed basins/wetlands, swales or other drainage works into a watercourse or waterfront land.

Outlet structures on waterfront land are a controlled activity under the *Water Management Act 2000* (WM Act). The Department of Planning and Environment administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity.

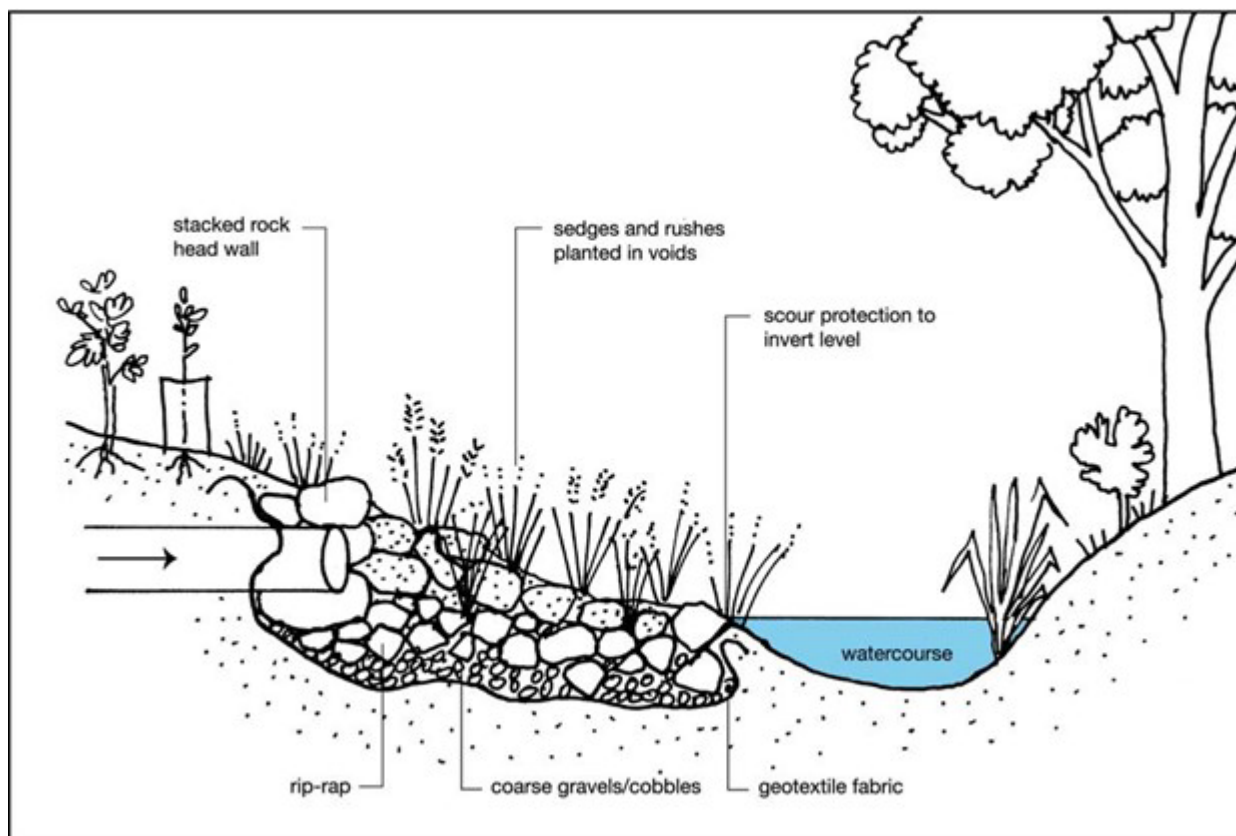
Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary.

This means a controlled activity approval must be obtained from the department before commencing the controlled activity.

Aims and objectives for outlet structures

The design and construction of stormwater outlets should aim to be natural yet provide a stable transition from a constructed drainage system to a natural flow regime as seen in Figure 1.

Figure 1: Natural outlet structure



The design and construction footprint and extent of disturbance within the riparian corridor should be minimised even allowing for the intended discharge function to be achieved. Refer to the department's [Guidelines for riparian corridors](#).

All ancillary drainage infrastructure, such as oil or grease interceptors, sediment and litter traps, constructed wetland, detention basins or any works requiring ongoing access or maintenance should be located outside the riparian corridor or in accordance with the department's guidelines for riparian corridors.

Water run-off from the site should be of appropriate quality and quantity before being discharged into a riparian corridor or watercourse.

Appropriate rehabilitation of disturbed areas following the installation of outlet structures should adequately restore the integrity of the riparian corridor.

Considerations in the design and construction of outlet structures

The design and construction of outlet structures should consider, but not be limited to, the following:

- Define the infrastructure route and identify the specific point of discharge. Where possible select a route along an existing cleared or disturbed area that avoids trees, preferably beyond their drip line.
- Choose a stable section of the stream for the discharge point, preferably mid-way between bends. Alternatively, incorporate outlet discharge points into disturbed/eroded areas which are to be stabilised or rehabilitated.
- Minimise construction footprint and proposed extent of disturbance to soil and vegetation within the watercourse or waterfront land.
- Demonstrate that changes to the hydrology of the receiving watercourse have been assessed and there is no detrimental impact on discharge volumes and channel velocities. Discharge velocities and flow rates should mimic natural flows and not initiate erosion.
- Discharge from an outlet should not cause bed or bank instability.
- Protect the bed of the watercourse below the outlet if not bedrock, or if bed scour is likely. Consider bank material and outlet jet effect and protect the opposite streambank if required.
- Point outlet structure and direct discharge downstream.
- The outlet should not protrude beyond the streambank but tie in with the adjoining bank alignment.
- Calculate tractive stresses generated from outlet discharges and from bank full discharges to determine appropriate rock size requirements for the structure.
- Rock rip-rap is the preferred material to provide a natural outlet. Rip-rap should extend for the full extent of the design scour apron and adjoining flanks/streambank. Rip-rap must be appropriately keyed in to withstand the velocities of runoff or discharge from the site and cut-off trenches should be provided where necessary.

- Rip-rap should consist of durable, angular run-of-quarry rock placed over a bedding layer of angular cobbles over geotextile. Where possible, incorporate vegetation such as sedges and rushes into scour management as Figure 1 for further stability.
- Grade scour apron to bed level of the watercourse or just below any permanent water created by any stable feature such as a rock bar within the watercourse.
- Stabilise and rehabilitate all disturbed areas including topsoiling, revegetation and regeneration, mulching, weed control and maintenance.

Information to be submitted for assessment

When seeking approval to outlet structures across a watercourse or waterfront land, the department will rely on the above information to undertake its assessment and to determine if the activity should be approved. All works and activities within watercourses should be designed by suitably qualified persons.

Additional information needed may include:

- detailed design drawings such as a surveyed plan, cross sections across the watercourse and a long section of the watercourse showing proposed works relative to existing and proposed bed and bank profiles and water levels. The cross-section is to extend to the landward limit of the identified riparian corridor. All plans must include a scale bar
- detailed plans showing the location, plan, plan view, elevation view and cross-section of the proposed outlet structure
- detailed plans of any permanent bed and bank stabilisation works for scour protection.
- a sediment and erosion control plan
- detailed report of pre- and post-construction hydraulic, hydrologic and geomorphic conditions
- photographs of the site should be supplied. To assist with future monitoring and reporting, all photo points should be identified by GPS coordinates or by survey, particularly for large-scale earthworks or extractive industries
- a vegetation management plan prepared in accordance with the department's guidelines for vegetation management plans
- a site management plan incorporating a works schedule, sequence and duration of works, contingencies such as in case of flooding, erosion and sediment controls and proposed monitoring and reporting periods
- costing of all works including materials and labour and stages of works including outlet structure installation and rehabilitation
- copies of other relevant approvals, for example development consent.

Maintenance period

Applicants may need to allow for a minimum maintenance period of 2 years after practical completion of each stage or until the site is stable. The maintenance period will depend on the

scope, size and level of risk. Engineering certification may be required at the end of the maintenance period. Maintenance until stable includes sediment and erosion control; the replacement of any works, vegetation or areas damaged or destroyed by flows and flooding or vandalism; and any other requirements necessary to ensure a naturalised stable watercourse system is functioning by the end of the maintenance period.

Security deposit may be required

Applicants should note that if the likelihood of significant impact on the watercourse or waterfront land is identified, security (as bank guarantees) may be required before the controlled activity is commenced. The amount of security is usually based on the costings provided.

More information

- For more information about controlled activities on waterfront land, visit the department's website at water.dpie.nsw.gov.au/licensing-and-trade/approvals.
- Copies of the Acts and associated regulations are available on the NSW Government legislation site at www.legislation.nsw.gov.au.

If you think you need to make a controlled activity application, our easy-to-use online support tool Water Assist can help you. Visit www.dpie.nsw.gov.au/water/water-assist.