

Mesh & Aggregate Drop Inlet Protection

SEDIMENT CONTROL TECHNIQUE

Type 1 System		Sheet Flow		Sandy Soils	✓
Type 2 System	[1]	Concentrated Flow	✓	Clayey Soils	✓
Type 3 System	✓	Supplementary Trap		Dispersive Soils	

[1] A Type 2 sediment containment system may be formed if the sediment trap is designed in accordance with the requirements established for *Sediment Weirs*.

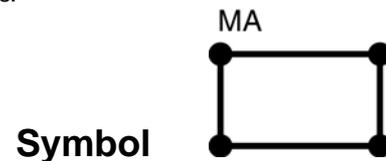


Photo 1 – Mesh and aggregate drop inlet protection



Photo 2 – A *Sediment Weir* can be used as an alternative to a traditional mesh and aggregate system

Key Principles

1. The critical design parameter is the surface area of the settling pond that surrounds the stormwater inlet.
2. The purpose of the aggregate is to control the rate of flow entering the stormwater inlet (thus allowing the formation of a settling pond around the inlet), and to provide limited filtration of flows passing through the aggregate.
3. During low flows, the trapping of coarse sediment is achieved through gravitational settlement within the settling pond, while the finer sediments are filtered by the combined aggregate and geotextile filter.
4. During high flows, sediment trapping is achieved primarily through gravitational settlement within the settling pond that forms around the drop inlet.

Design Information

Maximum catchment area 0.4ha on sites with low sediment runoff, or 0.1ha on sites with expected high sediment runoff yields.

The crest of the aggregate filter wall forms the high-flow spillway. The recommended maximum height of the spillway weir is 600mm, and the minimum height is 300mm.

Maximum spacing of support stakes is 0.6m.

Temporary flow control bunds may be required to control the depth and extent of ponding around the inlet (Figure 4). The crest of these bunds should be at least 150mm above the top of the aggregate filter.

Flow rate through the aggregate filter may be assessed using the procedures presented within the separate fact sheets for *Rock Filter Dams* and *Sediment Weirs*.

Installation procedure

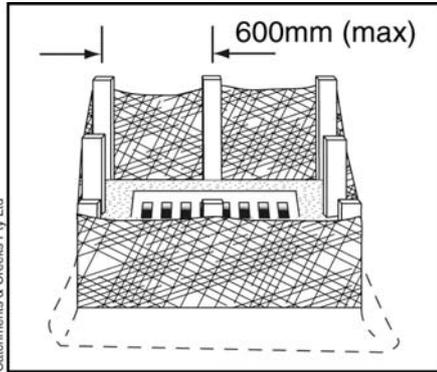


Figure 1 – Stage 1: Installation of support frame

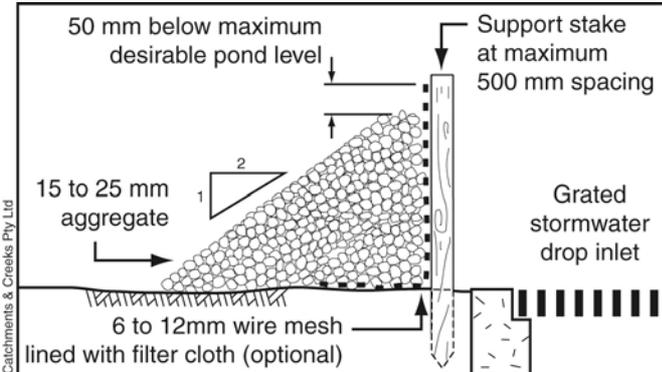


Figure 2 – Stage 2: Placement of wire mesh and aggregate

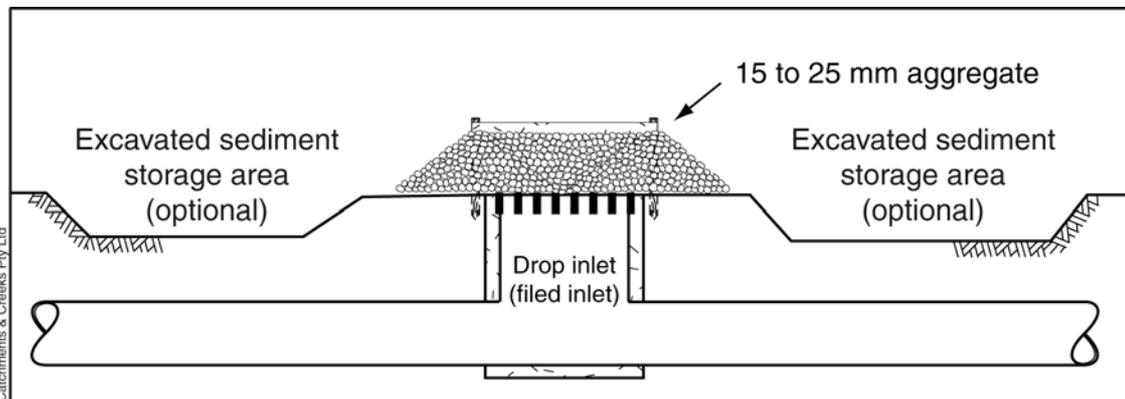


Figure 3 – Stage 3: Excavation of optional sediment collection trench

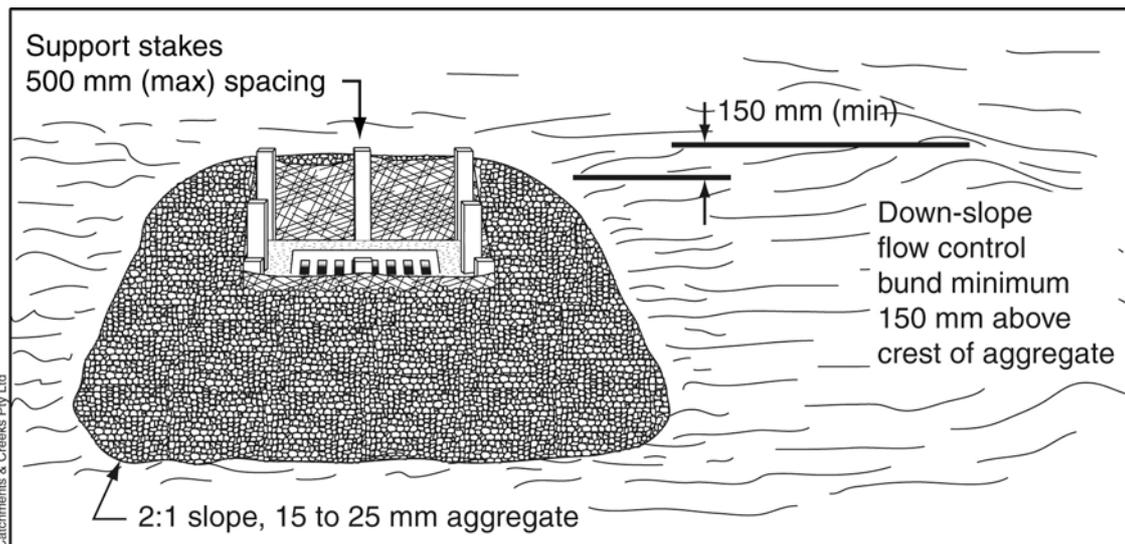


Figure 4 – Stage 4: Formation of optional flow control bund to limit extend and depth of the settling pond

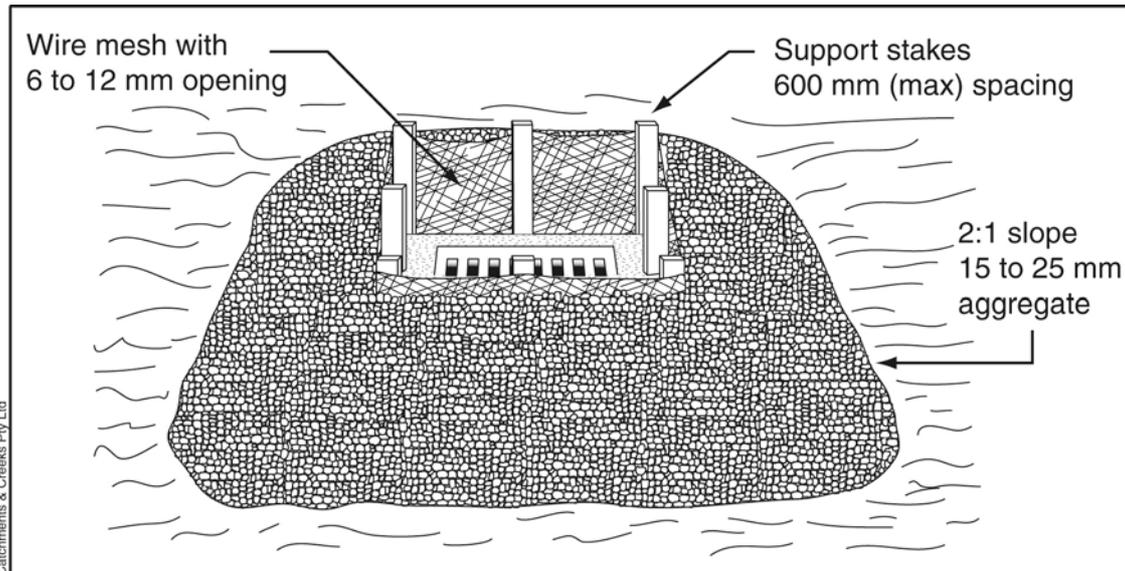


Figure 5 – Mesh and aggregate drop inlet protection

Description

Mesh and aggregate drop inlet protection systems consist of a wire mesh staked around a stormwater inlet with an embankment of clean aggregate placed against the mesh fence.

The crest of the aggregate embankment regulates the maximum depth of the settling pond.

For optimum treatment the wire mesh is covered with heavy-duty filter cloth.

Purpose

Used to remove and retain sediment from stormwater runoff before it enters the underground drainage network.

Most commonly used around field (drop) inlets, but can also be used on culvert inlets and pipe inlets.

Limitations

These sediment traps provide limited turbidity control.

Catchment area limited to around 0.4ha.

Not suitable for inaccessible areas where regular maintenance cannot be performed on the sediment trap.

The trap can become an undesirable traffic safety hazard.

Advantages

Simple to construct and maintain.

Relatively inexpensive.

Disadvantages

Usually requires regular maintenance to remove sediment and replace aggregate.

Drainage problems can occur if poorly designed or poorly maintained.

High sediment concentrations can quickly block the aggregate filter.

Common Problems

Drainage problems can occur if the aggregate blocks with sediment.

Can be damaged by construction traffic.

Special Requirements

When used near public roads, the sediment trap must not cause a traffic safety problem.

Allowance should always be made for potential bypass flows.

Where necessary, the sediment trap may need to be partially surrounded by a flow control bund to limit the extent and depth of ponding (Figure 4).

Location

Surrounding field (drop) inlets and at the inlet of minor culverts and pipe inlets.

Site Inspection

Check the flow path of potential bypass flows.

Look for potential flooding or traffic safety problems.

Check the maximum allowable pond depth.

Check the height and stability of any flow control bunds.

Materials

- Aggregate: 15 to 25mm crushed rock.
- Mesh: wire mesh with 6 to 12mm open grid, but with an open mesh size no greater than 75% of the nominal aggregate size.
- Stakes/posts: minimum 1500mm² (min) hardwood, 2500mm² (min) softwood, or 1.5kg/m (min) steel star pickets.
- Filter cloth: 'bidim' A44 (min) or the equivalent.

Installation

1. Refer to approved plans for location and dimensional details. If there are questions or problems with the location, dimensions or method of installation contact the engineer or responsible on-site officer for assistance.
2. Ensure that the installation of the sediment trap will not cause undesirable safety or flooding issues.
3. Where possible, excavate a 200x200mm trench around the inlet structure.
4. Cut wire mesh from a continuous roll to eliminate joints.
5. Space stakes evenly around the perimeter of the stormwater inlet at a maximum 600mm spacing and securely drive them into the ground.
6. Cut the mesh from a continuous roll to eliminate joints.
7. Place the bottom 300mm of wire mesh in the excavated trench and backfill the trench with at least 200mm of aggregate or compacted soil. If a trench cannot be excavated, lay the bottom 300mm of wire mesh evenly on the ground surface.
8. Securely fasten the weir mesh to the stakes. Joints must be overlapped to the next stake.
9. Where specified, cover the wire mesh (to the planned height of the aggregate filter) with heavy-duty filter cloth.
10. Place the aggregate filter against the weir mesh to the specified maximum height (no greater than 600mm) and at a batter slope no steeper than 2:1(H:V).
11. Ensure the maximum pond elevation will not cause a safety hazard, including undesirable flooding of an adjacent property or roadway.

12. Where necessary, establish a flow control bund(s) to appropriately manage the settling pond depth and movement of bypass flows.

13. If specified, excavate a sediment collection trench around the structure.

14. Take all necessary measure to minimise the safety risk caused by the structure and to prevent unsafe entry into the stormwater inlet.

Maintenance

1. Inspect the sediment trap after each runoff-producing rainfall event and make repairs as needed to the sediment trap and associated flow control bunds.
2. Remove collected sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.
3. Sediment deposits should be removed immediately if they represent a safety risk.

Removal

1. When the up-slope drainage area has been stabilised, remove all materials included deposited sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.
2. Bring the disturbed area to a proper grade, then smooth, compact and stabilise and/or revegetate as required.