

Erosion and Sediment Control Measures

2.8 Sediment Retention Ponds



Sediment retention ponds allow coarse to moderately fine particles to settle out of water before it is discharged. They are used in situations to minimise the discharge of *sediment* laden stormwater into highly sensitive receiving environments. These controls are used when other methods of control are inadequate for the site.

Sediment retention ponds can hold high volumes of *sediment* laden water. The outlet is generally at the opposite end to the inlet. *Sediment* retention ponds are not effective where *colloidal clay particles* are in suspension and in a concentrated flow. Decanting earth ponds are a retention pond variant that uses an inverted syphon pipe in the pond centre as an outlet.



This guide is provided as a reference document and does not constitute a statutory obligation under the Resource Management Act 1991 or the National Environmental Standards for Plantation Forestry.

Please refer to the 'how to use' section of the introduction at <http://docs.nzfoa.org.nz/forest-practice-guides/> for advice on how to use this guide.

Version 2.0, January 2020

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A Where and when to use

1. Where *sediment* has a very high risk of entering sensitive sites and causing significant adverse effects.
2. To help limit the movement of highly mobile *sediment*.

B Where not to use

1. If the site does not have sufficient construction area to size them properly, as they can be significant structures.
2. In *fill* – large volumes of water are involved which creates high static pressure that could cause *fill* to saturate and fail.
3. Within the active flood plain of *rivers*.

C Design

1. Seek advice from a forest engineer or specialist to determine sizing and design flow capacity, to ensure the risk of failure is minimised.
2. Design the structure to fit the terrain.
3. Consider potential hazards from large ponds to personnel and machinery.
4. The length to width ratio should be at least 3:1 to extend the flow path from the inlet to the outlet and provide time for *sediment* to settle out from the stormwater.

D Construction

1. Excavate in cut earth rather than in *fill* or disturbed soil. If the inflow or outflow has to pass through *fill*, then *flume* the water into or out of the structure.
2. Keep the slope of the inlet/outlet reasonably flat to avoid erosion. Otherwise form a rock armoured spillway or *flume*.
3. Ensure outflow is on stable ground. *Slash* or long grass can assist with *sediment* retention.
4. Note: concentrating water into a retention pond, rather than dispersing it, can create risk of failure. The consequences of failure can be significant.

E Maintenance

1. Prepare a routine maintenance plan including heavy rainfall response measures.
2. Check *sediment* ponds for structural integrity and capacity as part of any heavy rain or post-storm event road maintenance assessment. They need regular maintenance, especially on new construction.
3. Check that the structure is appropriately sized with a sufficient safety factor to control the stormwater *run-off*. Alternatively, re-direct some of the flow to another stormwater control measure.

F Other methods

1. *Slash* can be used downslope of *sediment* retention pond outlets.
2. Stormwater control measures, such as road drainage *culverts*, *cut-outs* and *flumes*.
3. Silt fences can also be incorporated.

National Environmental Standards for Plantation Forestry

Relevant regulations for *sedimentation* are 26, 27, 31, 33, 56.

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Examples

Sediment retention pond draining a landing.



Stable outlet.



Poorly sited (in fill) and designed/constructed sediment retention pond.



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Contact









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Other Practice Guides in this series

-  2.1 Water Tables
-  2.2 Cut-outs
-  2.3 Berms
-  2.4 Road Drainage (Stormwater) Culverts
-  2.5 Flumes
-  2.6 Sediment Traps and Soak Holes
-  2.7 Silt Fences
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