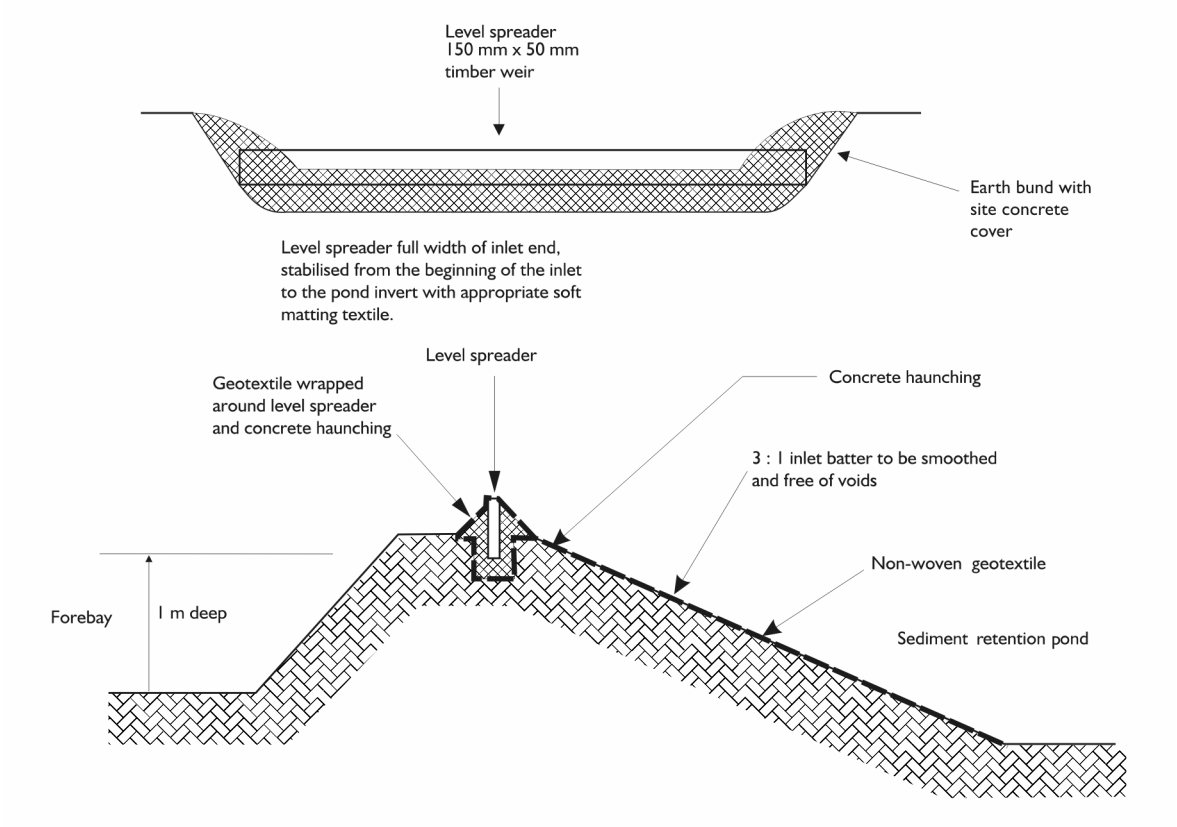
- Lay geotextile fabric in the level spreader trench and lay the fabric down the inlet batter to the dead storage level. The inlet batter slope should be 3:1.

Figure 7.8 Level spreader

Source Auckland Regional Council, 1999



Fore bay design

- Construct a sump or excavation in front of the level spreader to capture coarse-textured sediments, thereby reducing the quantity of sediment entering the pond.
- A fore bay should be the width of the pond and be a minimum of one metre deep and 2 metres wide.

Emergency spillway design

- The emergency spillway is a critical safety feature of a sediment retention pond and should be capable of passing the flow from the two percent AEP (50 year) storm.
- The emergency spillway needs to be well compacted and stabilised against erosion. It must always be the lowest point of the embankment. The invert should be level and protected against erosion.
- If fabric is used as a stabilisation measure, the surface must be smooth with no voids and covered with a needle-punched fabric pinned at 0.5 metre centres.
- The pipe and emergency spillway needs to discharge to stable outfalls such as an undisturbed depression or watercourse. Do not discharge over bare land, fill or unstable ground. If necessary, flume the outflow to an erosion-proof discharge point.
- A spillway should have at least 300 millimetre freeboard. Minimum spillway sizes are specified in Table 7.6.

Table 7.6 Soil type and emergency spillway width/hectare

Soil type	Spillway width (m/ha) @ 500 mm depth
Flat gravel	0.5
Flat silt loam (<10%)	0.5
Sloping silt loam (10 - 20%)	0.75
Steep silt loam (>20%)	1.0
Clay <20%	1.0
Clay >20%	1.25

Dead/live storage considerations

- 30 percent of the pond volume is retained as a permanent pool to dissipate inflow energy. This pool is called dead storage. The lowest floating decant is set at this point.
- Live storage is the upper 70 percent of pond volume, which fills during storms and is then drained by decant systems.

Decanting outlet devices design

Snorkel upstand (ponds less than 125 cubic metres):

- A snorkel-type upstand or decant can be installed on smaller ponds that have a capacity of less than one hundred and twenty-five cubic metres. The catchment area associated with this volume will vary with the soil type as shown in Table 7.7.

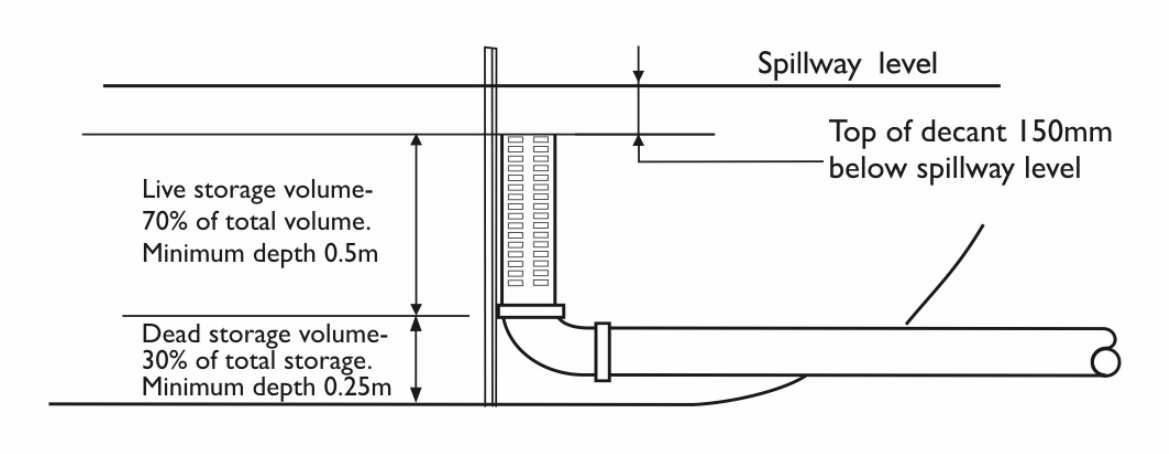
Table 7.7 Snorkel upstand and maximum catchment area

Soil type	Maximum catchment for snorkel decant (hectares)	Required volume/unit area of catchment ($m^3/100m^2$)
Flat gravel	2.0	$0.75m^3/100m^2$
Flat silt loam (<10%)	1.00	$1.5m^3/100m^2$
Sloping silt loam (10–20%)	0.75	$2.0m^3/100m^2$
Steep silt loam (>20%)	0.6	$2.5m^3/100m^2$
Clay (<20%)	0.65	$2.25m^3/100m^2$
Clay (>20%)	0.5	$2.75m^3/100m^2$

Details associated with the snorkel upstand or decant are shown in Figure 7.9 and discussed more fully in the section on decanting earth bunds (section 7.2.2).

Figure 7.9 Snorkel upstand for ponds less than one hundred and twenty-five cubic metres

Source Auckland Regional Council, 1999



Floating decant devices (for ponds more than 125 cubic metres):

Decant arms

- A floating decant device is designed to drain the cleaner water at the top of a pond while maximising sediment deposition.
- A standard T-bar decant is shown in Figure 7.10.

Pond water is drained through 10 millimetre diameter holes drilled in rows along the 2 metre long decant arm. The number of holes is determined by the need to ensure appropriate detention to maximise sediment deposition. This will vary with the soil type, as shown in Table 7.8. The maximum number of holes per decant is two hundred, to optimise sediment retention at lower pond volumes.

Table 7.8 Decant design

Soil type	Holes/hectare	Hectares/decant
Flat gravel	27	7.4
Flat – moderately sloping silt loam (0–20%)	72	2.8
Steep silt loam (>20%)	90	2.2
Flat clay (<20%)	72	2.5
Steep clay (>20%)	72	2.0

Figure 7.10 Decant detail

Source: Modified from Auckland Regional Council, 1999