

That's a nasty cough
you've got there.





GREYWATER TREATMENT OPTIONS

Reed Beds-Definition

- A sealed gravel filled trench in which aquatic plants are grown. Wastewater is allowed to slowly travel through the bed during which time wastewater quality is improved from the resulting aeration

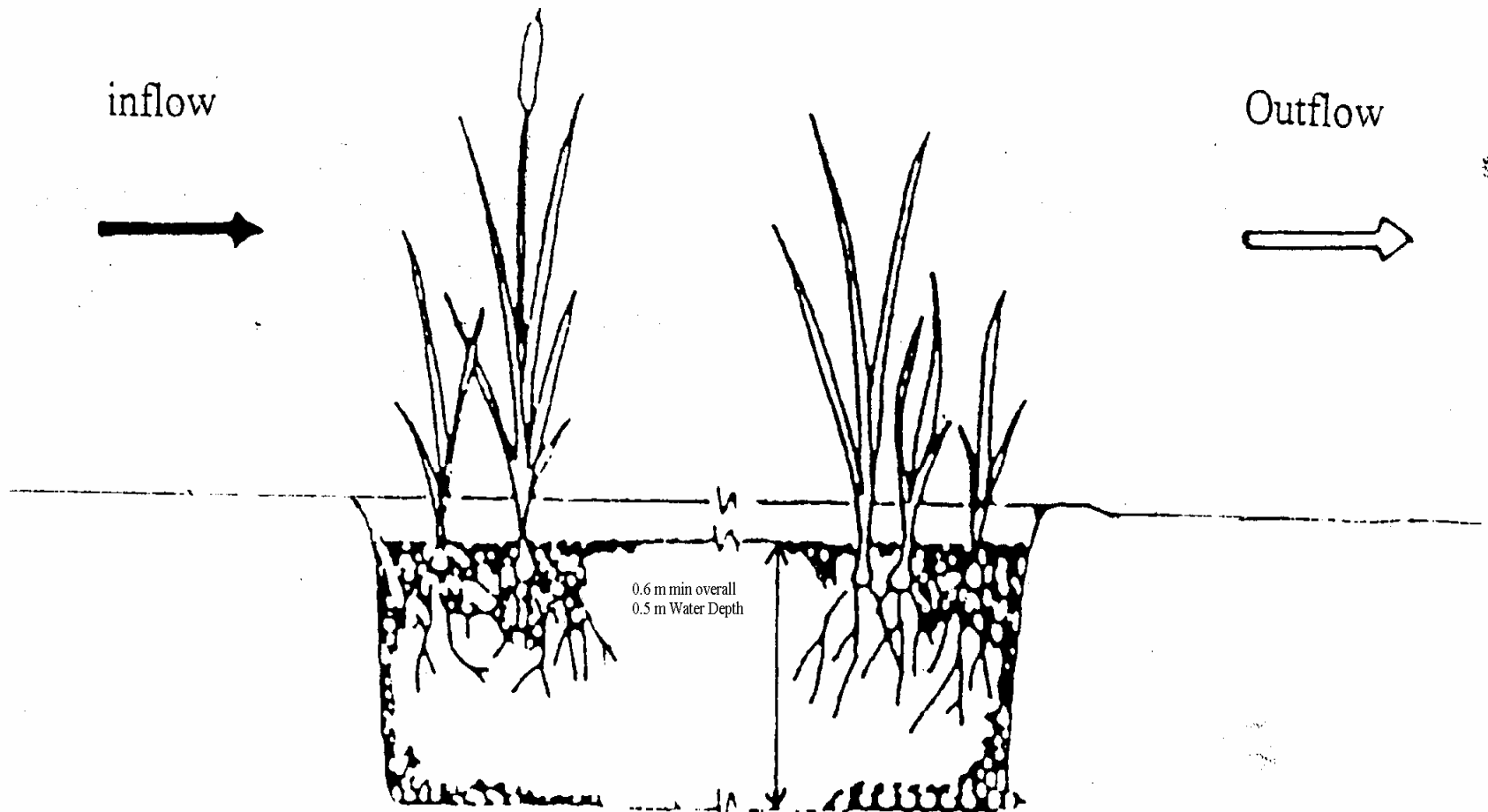




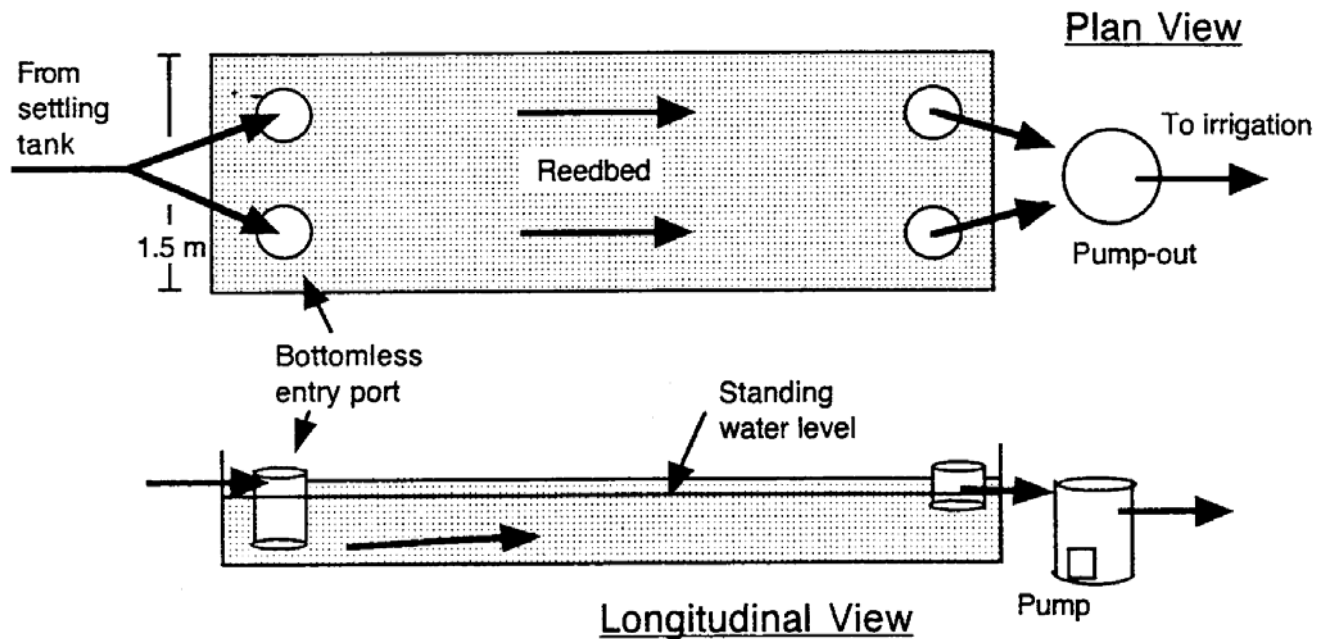
Requirements

- Note that wastewater must be primary treated before entering the reed bed
- Greywater flows are based on 100 L /person/day
- Bed setbacks are based on the construction method
- Dispensation from the Sewerage Act is required in areas administered by SA Water

Reed Bed design

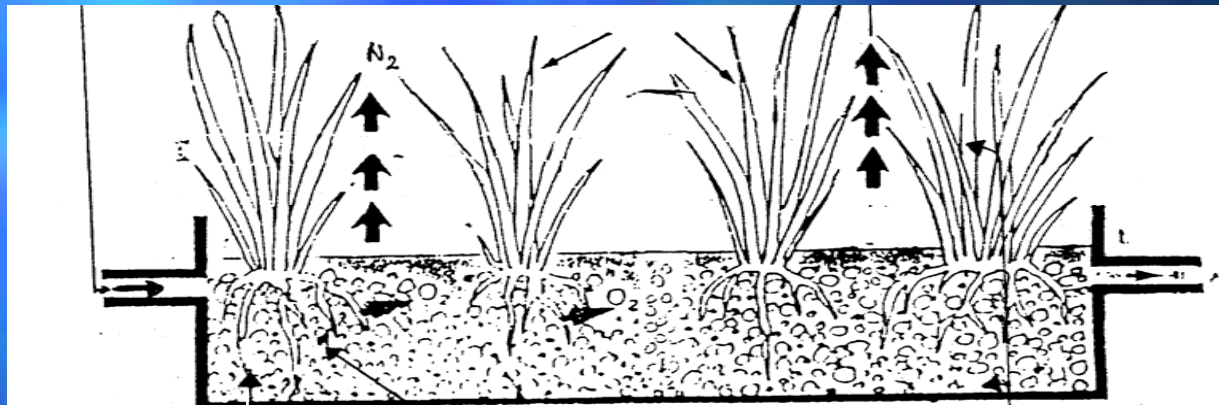


Inlet /outlet Structures



Wastewater flows under the surface of the gravel and is retained for at least 5 days

Some Water is evaporated
Roots of the reeds provide oxygen for microbial activities



Pathogen reduction by natural die off and antibacterial action of the roots in some species

Pollutants are consumed by microorganisms growing on the gravel.

N and P are utilised by plants to grow or stored in the sediment of the bed

Sizing (Based on USEPA Model)

- The minimum size for greywater systems for 6 persons should incorporate:
 - Minimum of 5 days detention
 - Surface area of at least 18 m²
 - Gravel substrate (20 mm)
 - Water depth of not less than 500 mm and 100 mm cover
 - Have a level base or not greater than 1 %

Disposal Area

- Pressurized flow to ensure even distribution via pump sump and pump
- Sub surface irrigation
- Soakage
- Surface irrigation after disinfection

For Sub Surface Irrigation

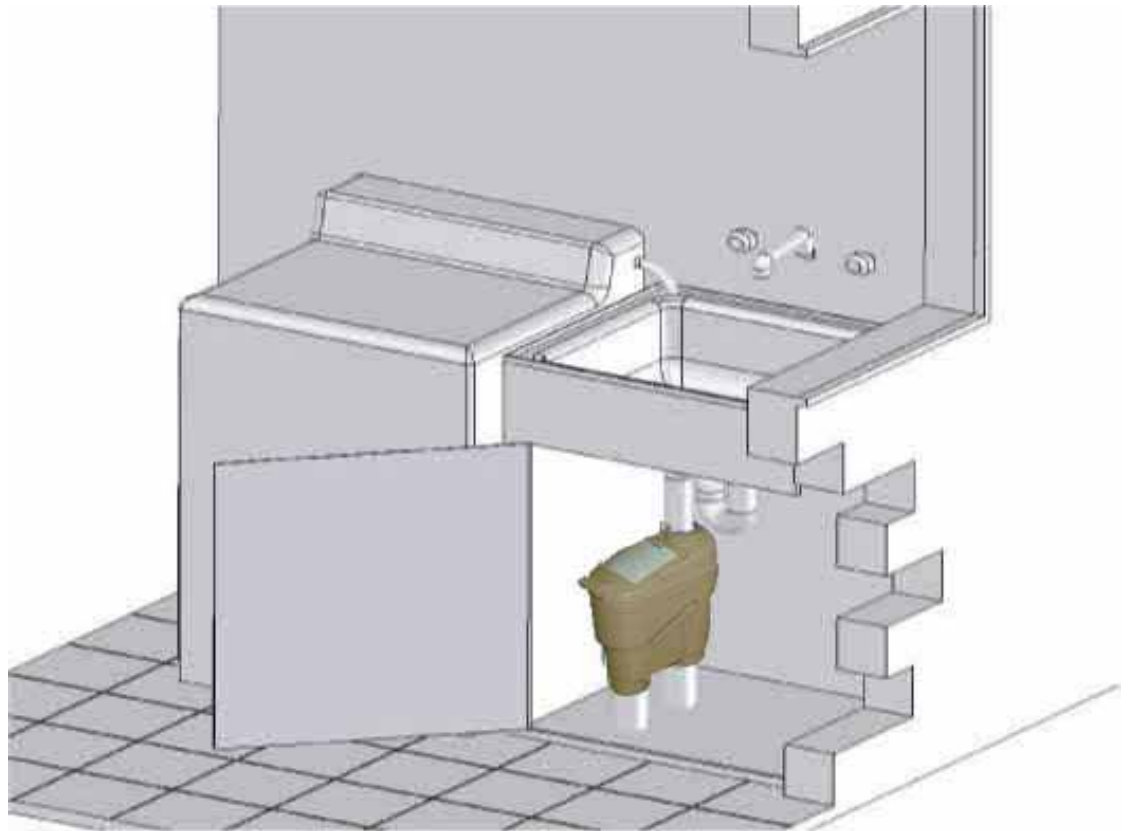
- Area requirements are as per engineer's instructions (comment required).
- Installation in accordance with AS/NZS 1547 2000.

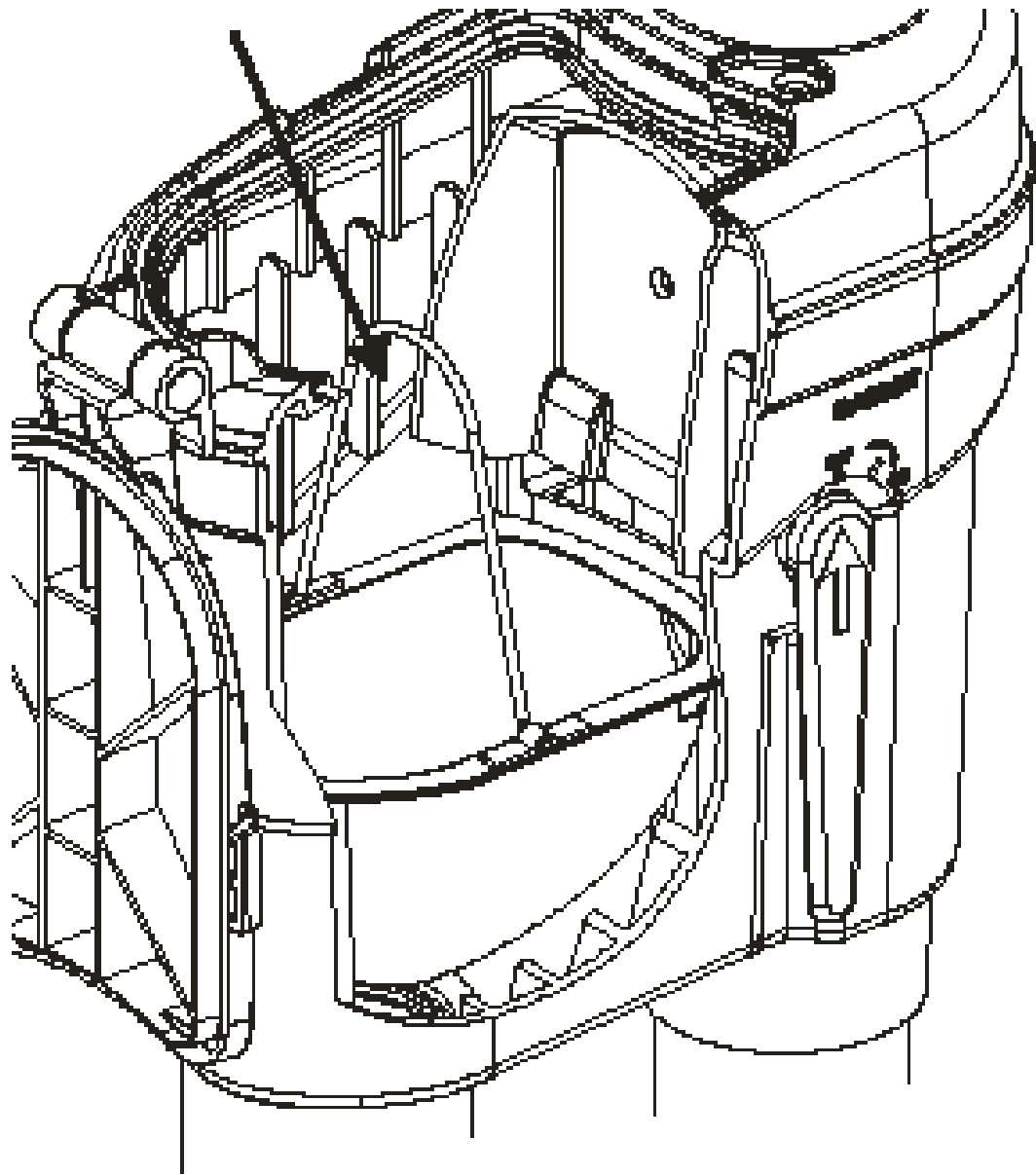
Comments

- Area requirements
- Reeds may take 2 years to mature
- Maintenance (harvesting)
- Care for holiday periods
- Sensitive to input of chemicals etc
- Reuse of greywater component
- Aesthetically pleasing

GREYWATER DIVERSION DEVICES

Greywater Diverter







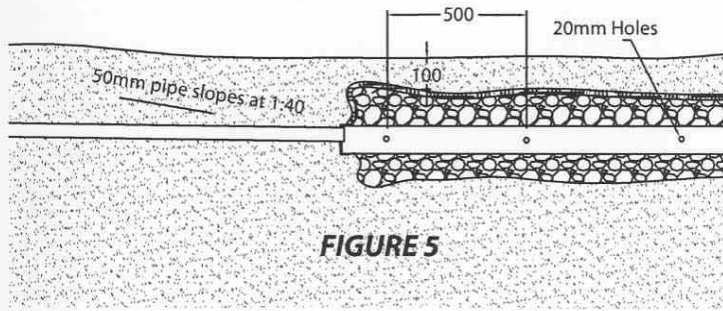


FIGURE 5

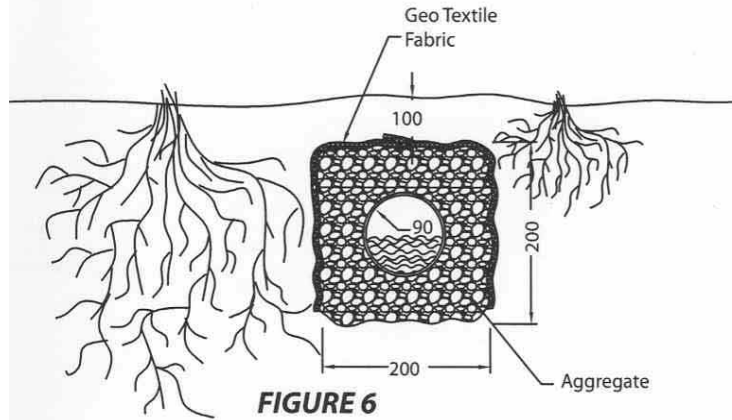


FIGURE 6

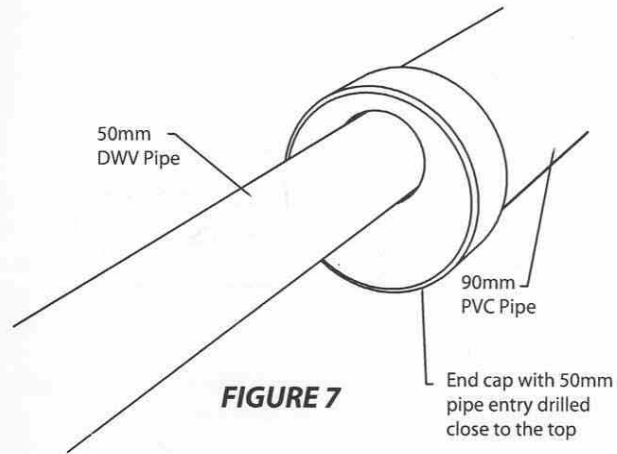


FIGURE 7

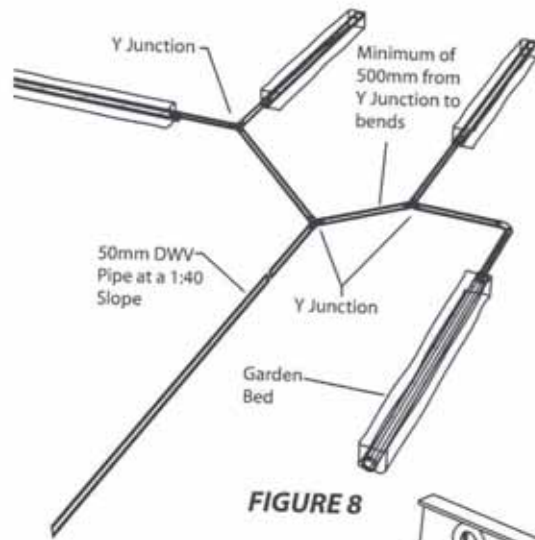


FIGURE 8

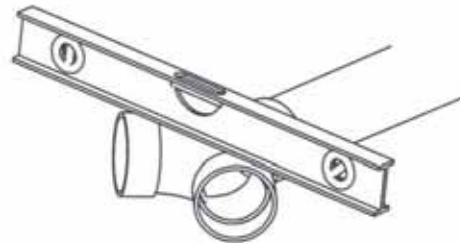


FIGURE 9



FIGURE 10

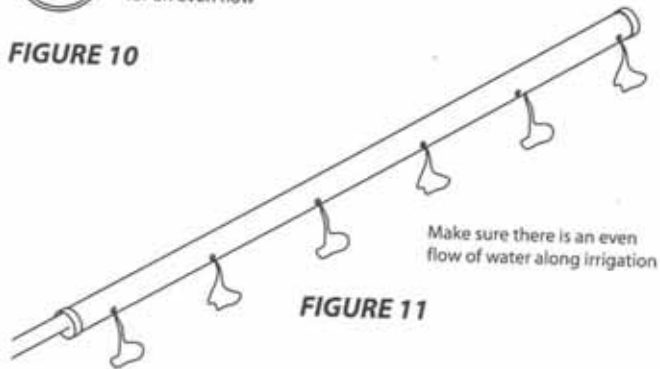
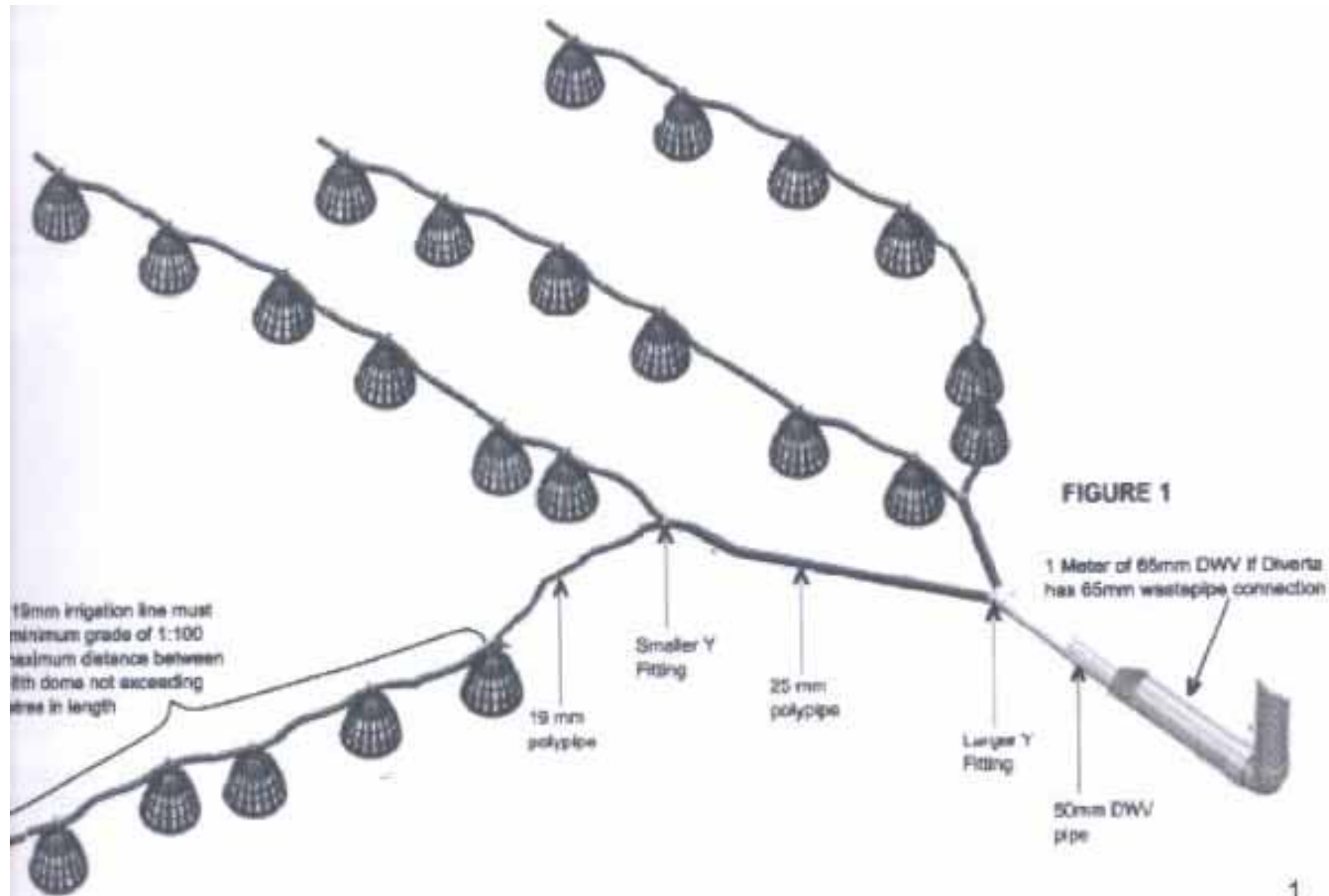


FIGURE 11



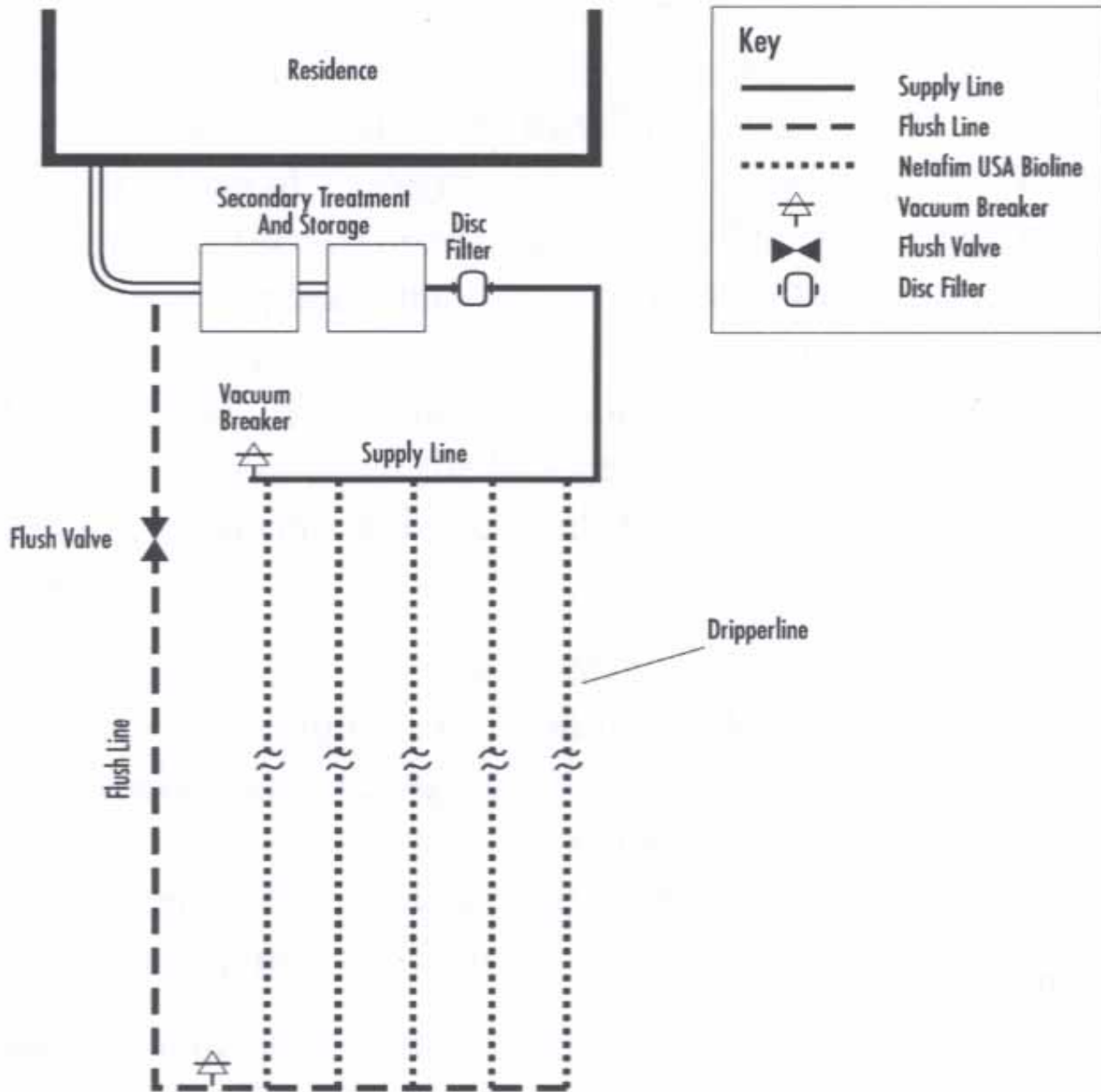
Approval Conditions:

- **Occupational health and safety issues with regard to homeowner maintenance - gloves worn and disposal of lint etc**
- **All sales in SA must be accompanied by a notice to users outlining requirements as follows:**

- **Obtain SA water permission in their areas**
- **Applications to the relevant authority must be made**
- **Installation carried out by a licensed plumber**
- **Can only be used for bathroom and laundry waste**
- **Check with your plumber that your plumbing is suitable for retrofitting of the device**
- **Not suitable for poorly drained soils * eng report**
- **All current setbacks apply**
- **Cross connection prohibited**
- **Manufacturer to provide list of all SA agents**

Shallow Sub Surface Irrigation (AS 1547)

- Setbacks as per Supp B
- 20/30 Std (AWTS) effluent required



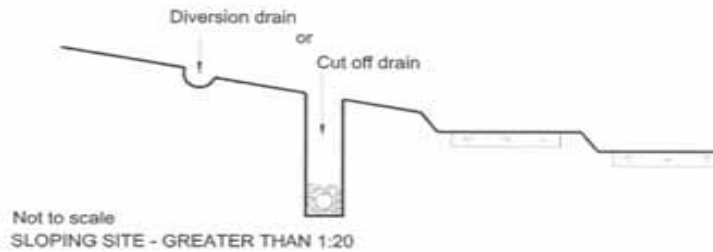
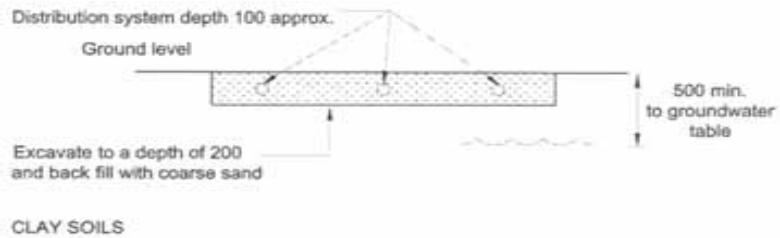
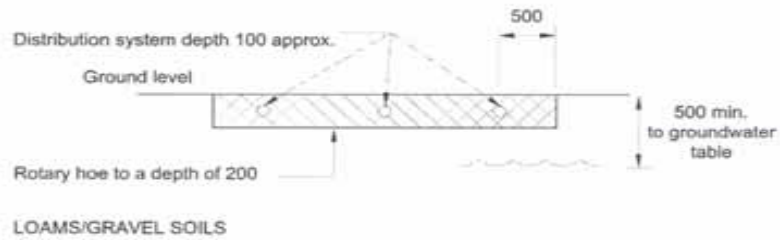
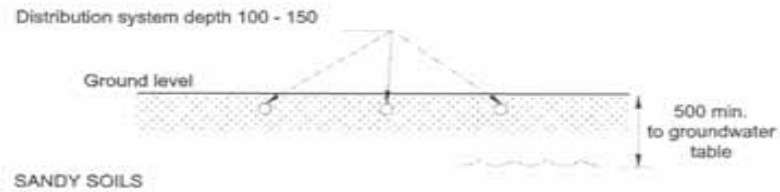
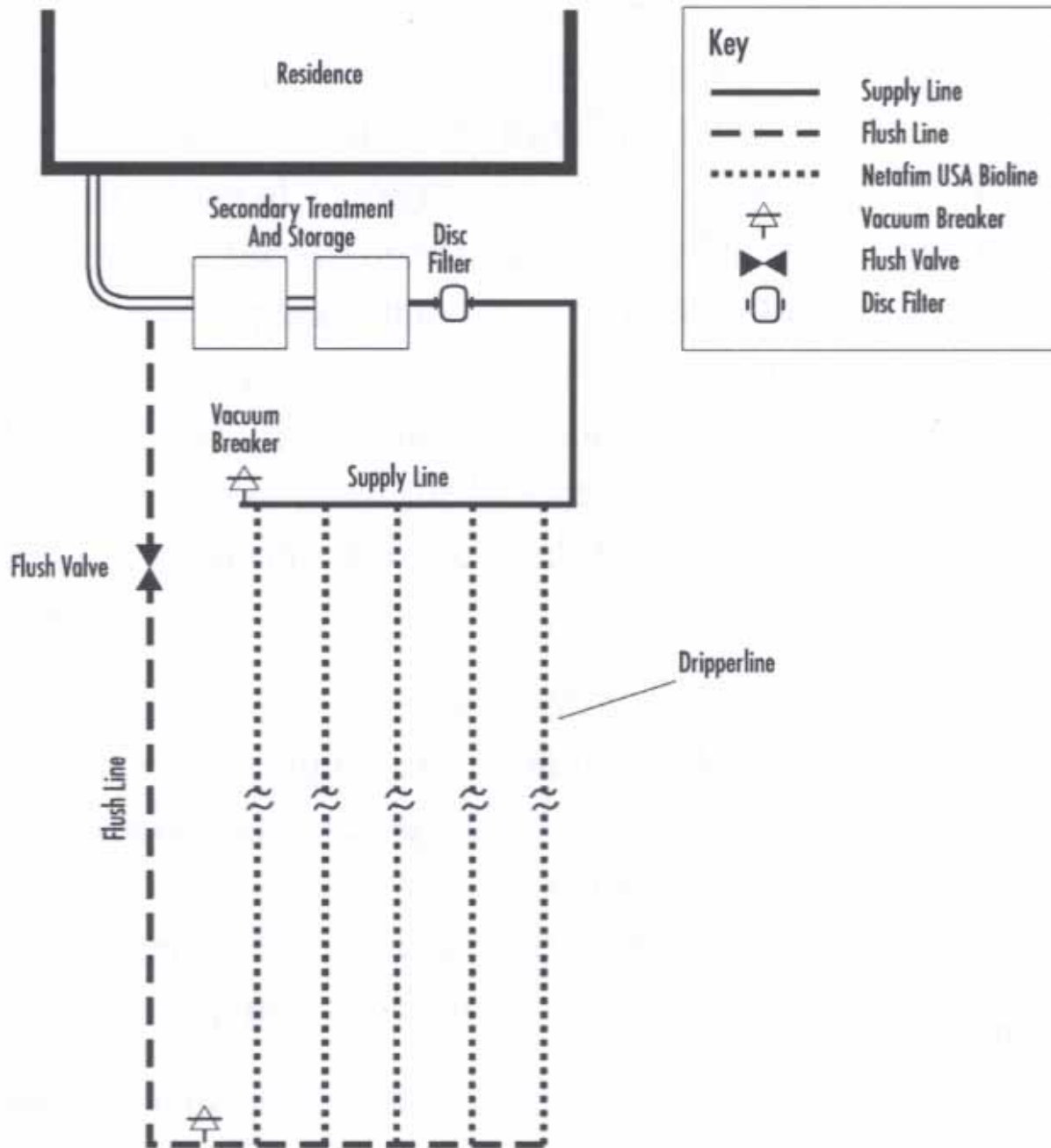


FIGURE 4.5C1 SHALLOW SUBSURFACE DRIP IRRIGATION SYSTEM

■ Pump and Irrigation System Shall :

- Be Matched to the Required Hydraulic Characteristics of the Irrigation System
- Include a sump with volume of at least 200 L
- Be able to discharge at least 50% more than the 30 minute flow rate
- Not to have drip rates varying more than 10% from the design rate
- Possess pipework which must be designed to withstand 150 % of the shutoff head of the pump

- Must distribute effluent evenly
- Be permanently buried and fixed
- Dripper system buried to at Least 100 mm
- Maximum spacing to be 1000 mm in clay and 600 mm in sand
- Be provided with an in line strainer (150 – 200 mesh) to prevent blockages
- Vacuum Breakers to be provided.
- Scour valves to be provided.
- Precommissioning tests
- Operation of the Pump, check the system
- Signage or underground marking tape to be used for location of system



Issues:

- *Flushing of the System... Where To?*
- *Disinfection Requirements*
- *Trifluralin Injection/ Root Inhibitor*
- *Cross connection issues*