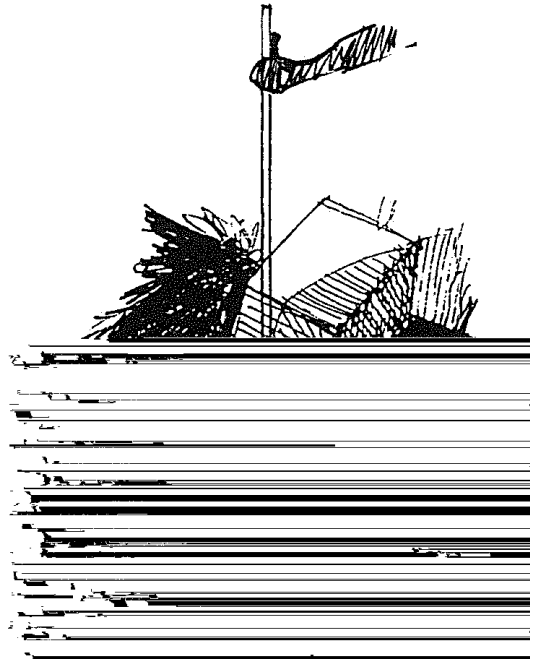
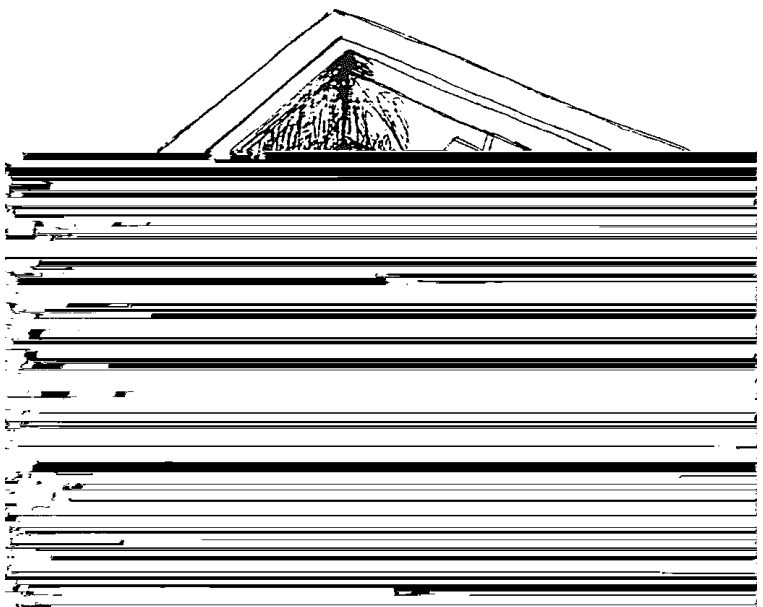


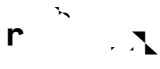
O r r r r

The effectiveness of slow sand filters depends very much on the style of operation and maintenance. A major advantage of this process is the limited number of tasks which must be performed, (For design notes, refer to *Technical Brief No. 15.*)

D

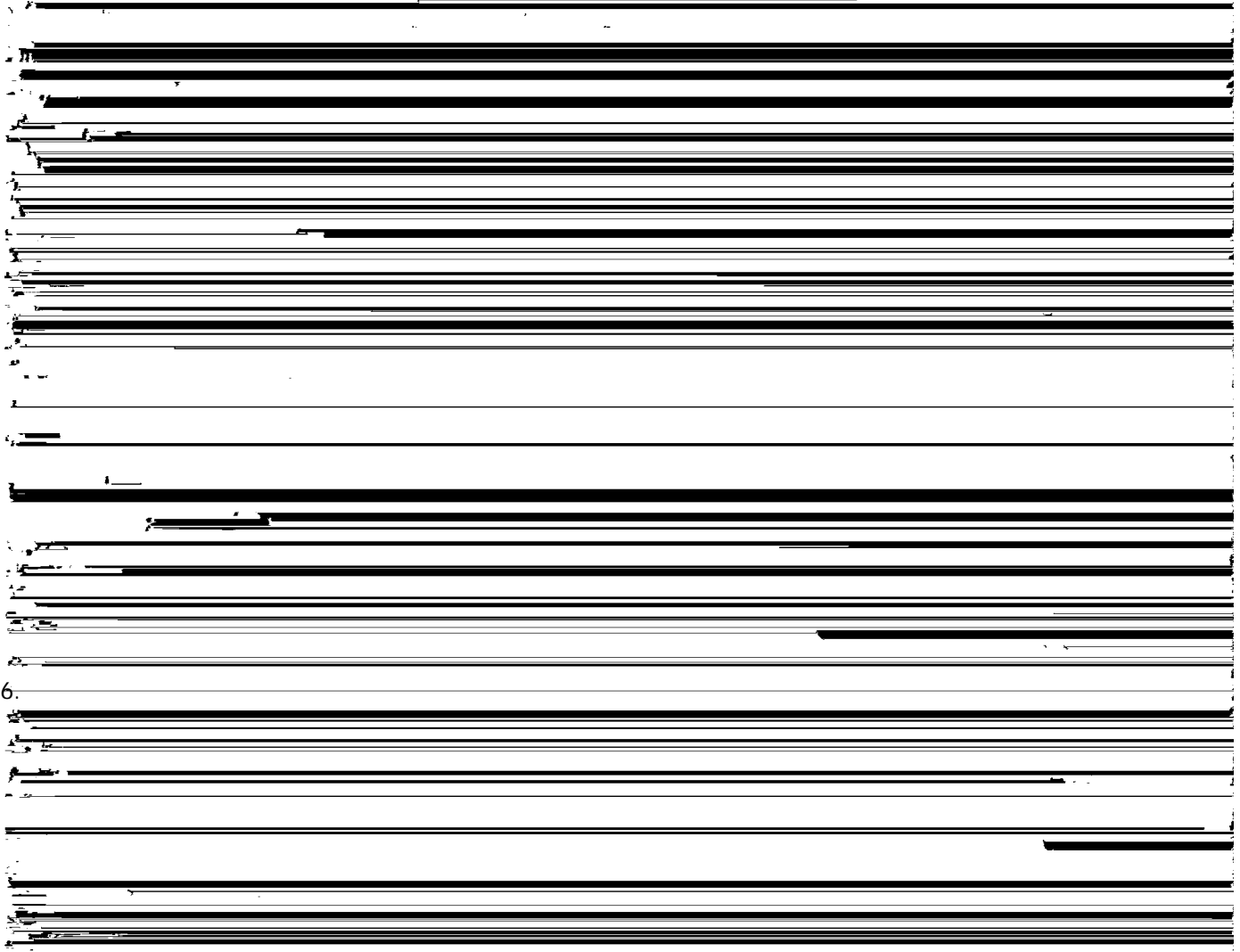
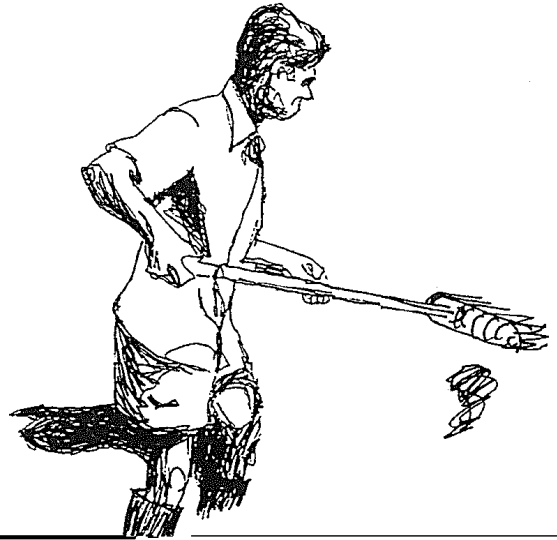
1. Ensure the depth of water in the reservoir above





Scraping becomes necessary when, with the maximum head of water available above the sand and the outlet valve fully open, it is not possible to obtain the design flow.

(When scraping the filter, it is essential to take measures to control the personal habits of the workers. There should be no spitting, urinating or defecating. Tools should be disinfected.)



Carry away dirty sand

Do's

Do's

- **Do** make sure that the cleaning operation is carried out quickly — one day is usually sufficient.
- **Do** make sure that there is a bath tray of clean water for all the personnel involved to walk through each time they enter the filter. Footwear should be provided.

Walk through a bath tray of water

Do control the personal habits of workers in the filter. No spitting, urinating or defecating.

- **Do** make sure that all birds are continually scared away from the exposed sand.

Scare birds away from the filter

- **Do** refill the empty filter from the bottom.

Don'ts

- **Don't** dig up the whole of the sand bed during cleaning.
- **Don't** allow the level of the water in the reservoir to fall.
- **Don't** operate at varying rates.
- **Don't** allow people who are unwell to enter the empty filter during cleaning.
- **Don't** clean more than one filter at a time.
- **Don't** allow birds to foul exposed sand during cleaning.

Gravel

The following notes relate to *Technical Brief No.15, Slow Sand Filter Design*, and are intended to clarify design points.

1. Gravel

Instead of four layers of graded gravel illustrated, it is possible to use only a three-layer gravel system:

Top layer: 100mm depth of 1-1.5mm gravel

Middle layer: 100mm depth of 4-6mm gravel

Bottom layer: 100mm depth of 16-23mm gravel

2. Uniformity Coefficient

The Uniformity Coefficient is the mesh size of a sieve in mm which retains 90% of the sand divided by the mesh size of a sieve in mm which retains 40% of the sand.

3. Inlet and Outlet Control Systems

(i) The function of the inlet control system is to maintain a constant head of water above the sand.

(ii) The function of the outlet control system is to regulate the flow of water to the design rate.

4. Sand Depth

A minimum depth of sand of 600mm is recommended to ensure the complete removal of viruses.

Reference:

Poynter, S.F.B. and Slade, J.S., *The removal of viruses by slow sand filtration*, Prog. Water Technol., a 10 -2.9 Tdtevroger in la-20