

# 9.00

## THE USE OF HUNTER LAND DRAINAGE PERFORATED PIPES

### Hunter Underground Systems

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- 9.03 Groundwater Drainage
- 9.04 Dispersal of Septic Tank Effluent



# 9.01

## The use of Hunter land drainage perforated pipes - General

### GENERAL

Hunter's socketed land drainage pipe is available in 6 metre lengths in 110mm and 160mm diameters.

Perforated pipes are used in french drain installations, draining ground water and Surface water from areas including roads, sports grounds, racecourses, land reclamation, retaining walls and land drainage.

Where land drainage is required to reduce the ground water level permanently in order to enable development to proceed, expert advice should be obtained.

General installations details can be obtained from Approved Document H of the Building Regulations.

### SURFACE WATER DRAINAGE (FIG 1)

When used to control rainfall draining from impermeable ground such as roads, car parks and airfields, the camber of the paved or concreted area runs rain water in to the permeable fill above the perforated pipe. In this instance the surrounding filter drain material (Type B) is of course nature to allow Surface water to percolate freely through it. However, grit from road surfaces may block the filter which may require cleaning periodically. As an additional precautionary measure to limit soil migration, a geotextile fabric can be incorporated into the filter drain.

### GROUNDWATER DRAINAGE (FIG 2)

Used to drain sub soil groundwater from park, football pitches, gardens, building sites etc. Another application is the draining of groundwater behind a retaining wall, where the perforated pipe is laid at the base of the wall to prevent the build up of water behind the wall.

The pipe should be laid on a granular bed and be surrounded by (Type A) filter drain material, so graded as to strain soil particles out of the water passing through it. A geotextile fabric should not be required provided that this surrounding material is used.

In normal applications for filter drains the pipes should be laid with the holes facing down.

#### Minimum depths for laying land drainage.

No load	350mm
Light load	750mm
Road	900mm
Field	600mm
Ploughed field	900mm

### DISPERSAL OF SEPTIC TANK EFFLUENT (FIG 3)

Hunter perforated pipes may be used to dispose of septic tank effluent by sub-surface irrigation. To allow the dispersal of water of sewage effluent from small sewage treatment works and cesspools into the underground strata, the pipe is laid with the holes downwards.

The groundwater table must be below the invert level of the pipe. The permeable fill should be covered with a strip of plastic to prevent the ingress of silt and fine particles.

### SEPTIC TANK PIPEWORK

1. Lay pipes in trenches with a uniform gradient not steeper than 1:200 from the septic tank outlet.
2. Install unperforated drain pipe with a fall of 1:30 for the first 3 metres. Installing an Inspection Chamber at this point will make it easier to monitor land damage.
3. Lay the pipes on, and surround them with clinker, clean gravel or broken stone 20mm - 50mm grade. Consult the septic tank manufacturer for advice on whether to position the perforations upwards or downwards in the trench.
4. Place a layer of polythene sheet over the perforated pipe before backfilling.

### Grading Requirements for filter drain material

Percentage by mass passing sieve			
BS Sieve sizes	Grade material		
	Type A	Type B	Type C
63mm	-	100	Special grading decided by the specifier, depending upon the nature of the soil to be drained.
37.5mm	-	85 - 100	
20mm	100	0 - 25	
10mm	-	0 - 5	
5mm	60 - 100	-	
1.18mm	15 - 45	-	
600mic	0 - 25	-	
150mic	0 - 5	-	

# 9.02

## Surface water Drainage

FIG.1 FILTER/COLLECTOR DRAIN

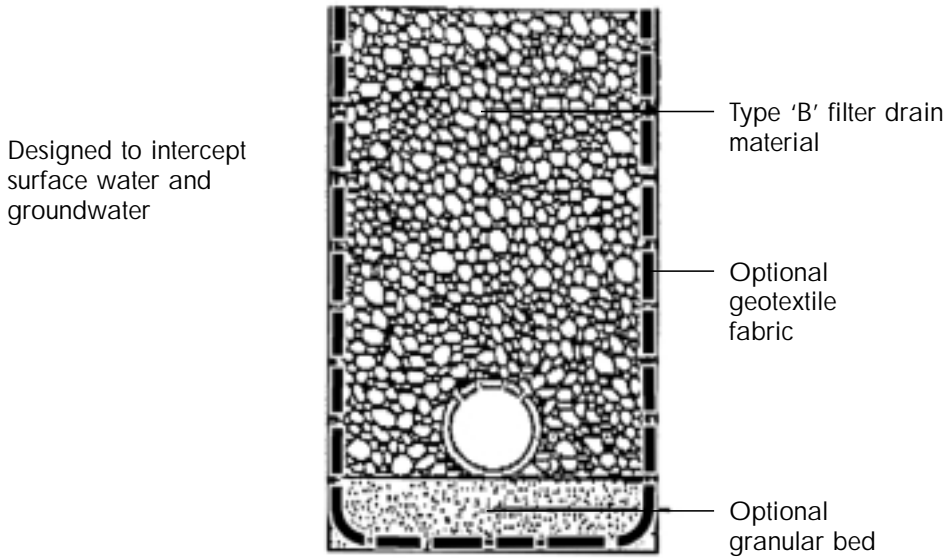
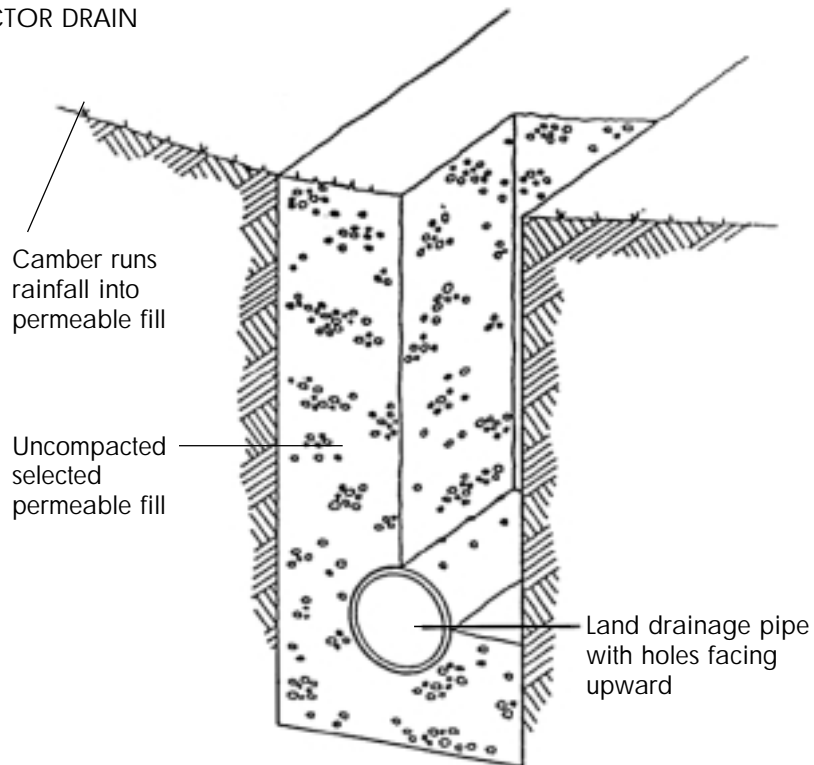


FIG.1A FILTER/COLLECTOR DRAIN



# 9.03

## Groundwater Drainage

### 9.03 GROUNDWATER DRAINAGE

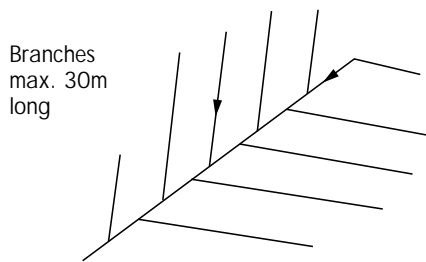
There is a choice of several pipework systems as shown in the drawings below.

The choice of any one system would depend on the site conditions.

#### SYSTEM PATTERNS

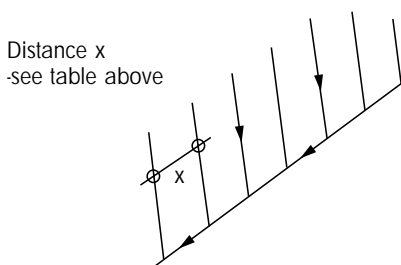
##### HERRINGBONE

A main drain or drains receiving the discharge from smaller branches running parallel to each other on both sides and at an angle to the main drain.



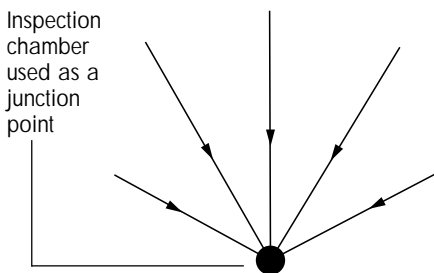
##### PARALLEL

One side of a herringbone system. Used when it is necessary to drain from one side.



##### FAN

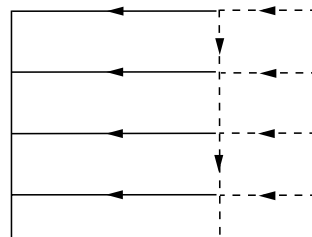
Tributary drains converging to a single outlet at one point on the boundary of the site, without the use of a main (collecting) drain.



Spacing of branch drains (Distance x)		
	Distance between branch groundwater drains for various depths to invert of main drains	
	Mains 0.8 to 1.0m deep	Mains 1.0 to 1.5m deep
	m	m
Sand	-	45 to 90
Sandy loam	-	30 to 45
Loam	16 to 20	20 to 30
Clay loam	12 to 16	15 to 20
Sandy clay	6 to 12	-
Clay	2 to 6	-

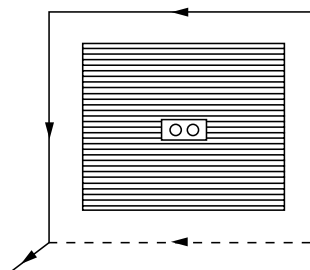
##### GRID-IRON

Consisting of a main or several main drains near site boundaries into which branches discharge from one side only.



##### MOAT OR CUT-OFF

Occasionally subsoil drains are laid on one side or several sides of a building to intercept the subsoil water and carry it away, so protecting the foundations of the building.



# 9.03

## Groundwater Drainage

FIG.2 FILTER DRAIN

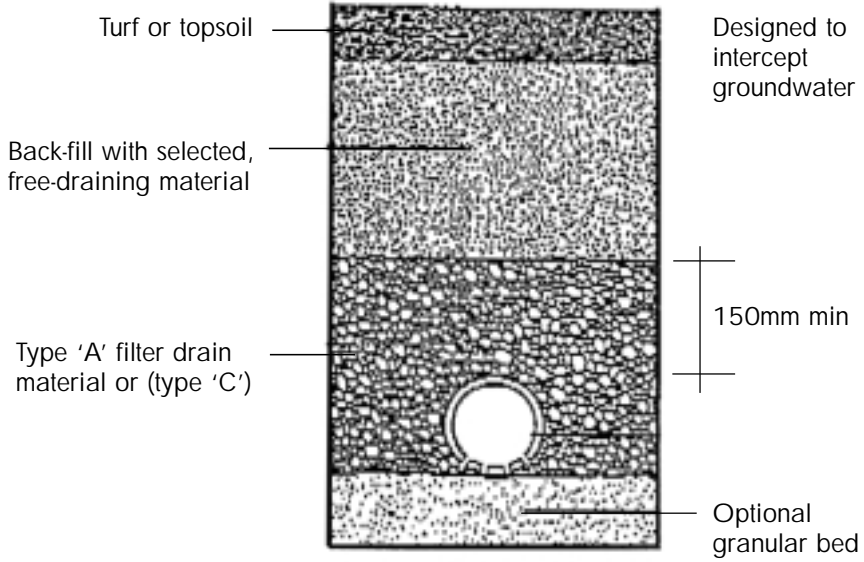
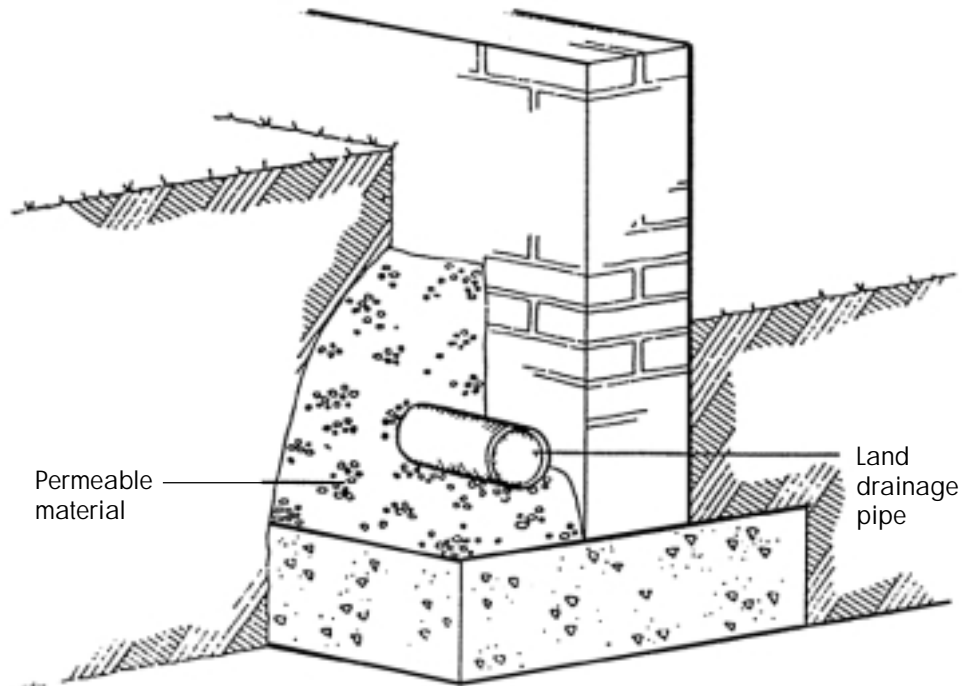


FIG.2A LAND DRAINAGE PIPE BEHIND A RETAINING WALL



# 9.04

## Dispersal of Septic Tank Effluent

FIG.3 DISPERSAL DRAIN

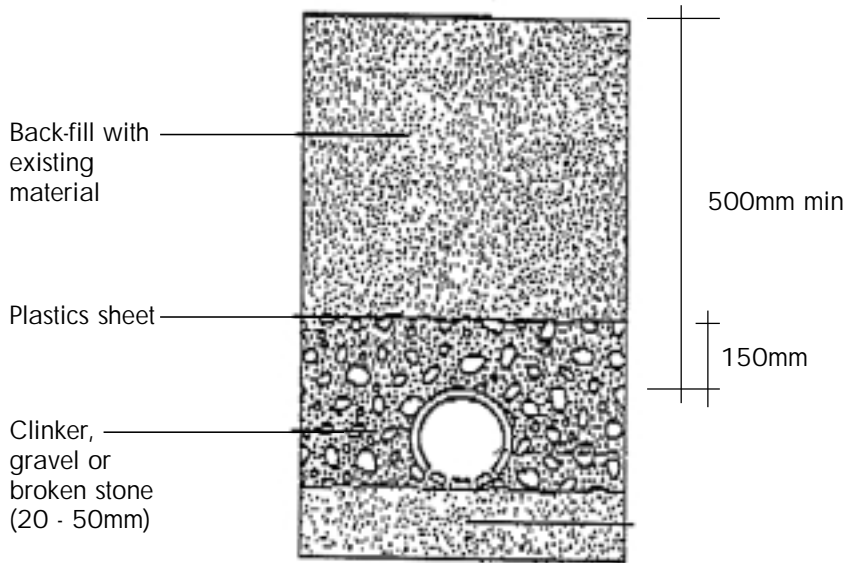


FIG.3A LAND DRAINAGE PIPES FOR DISPOSAL OF SEPTIC TANK EFFLUENT

