

cut in pipes a drilling device should be used to avoid damaging the pipe.

**2.16** Where connections made to existing drains or sewers involve removal of pipes and insertion of a junction, repair couplings should be used to ensure a watertight joint and the junction should be carefully packed to avoid differential settlement with adjacent pipes.

**2.17** Sewers (serving more than one property) should be kept as far as is practicable away from the point on a building where a future extension is likely (e.g. rear of a house, or side of house where there is room for a side extension).

**2.18** The system should be ventilated by a flow of air. A ventilating pipe should be provided at or near the head of each main drain. An open ventilating pipe (without an air admittance valve) should be provided on any drain fitted with an intercepting trap (particularly on a sealed system), and on any drain subject to surcharge. Ventilated discharge stacks may be used (see paragraphs 1.27 and 1.29). Ventilating pipes should not finish near openings in buildings (see paragraph 1.31).

**2.19** Pipes should be laid to even gradients and any change of gradient should be combined with an access point (see paragraph 2.49).

**2.20** Pipes should also be laid in straight lines where practicable but may be laid to slight curves if these can still be cleared of blockages. Any bends should be limited to positions in or close to inspection chambers or manholes (see paragraph 2.49) and to the foot of discharge and ventilating stacks. Bends should have as large a radius as practicable.

**2.21** Drainage serving kitchens in commercial hot food premises should be fitted with a grease separator complying with prEN 1825-1 and designed in accordance with prEN 1825-2 or other effective means of grease removal.

## Special protection – Rodent control

**2.22** Where the site has been previously developed the local authority should be consulted to determine whether any special measures are necessary for control of rodents. Special measures which may be taken include the following.

- Sealed drainage – drainage having access covers to the pipework in the inspection chamber instead of an open channel. These should only be used in inspection chambers, where maintenance can be carried out from the surface without personnel entry.
- Intercepting traps – These are susceptible to blockage and require frequent maintenance. Intercepting trap stoppers should be of the locking type that can be easily removed from the chamber surface and securely replaced

after blockage clearance. It is important that stoppers are replaced after maintenance. These should only be used in inspection chambers where maintenance can be carried out from the surface without personnel entry.

c) Rodent barriers – A number of rodent barrier devices are used in other countries, these include: enlarged sections on discharge stacks to prevent rats climbing, flexible downward facing fins in the discharge stack, or one way valves in underground drainage.

d) Metal cages on ventilator stack terminals, should also be used to discourage rats from leaving the drainage system (see paragraph 1.31).

e) Covers and gratings to gullies may be displaced or attacked by rats. Solid plastic covers or metal gratings which can be fixed in place should be used to discourage rats from leaving the system.

## Protection from settlement

**2.23** A drain may run under a building if at least 100mm of granular or other flexible filling is provided round the pipe. On sites where excessive subsidence is possible additional flexible joints may be advisable or other solutions such as suspended drainage, particularly where the pipe is adjacent to structures or where soil conditions change in the course of the pipe run. Where the crown of the pipe is within 300mm of the underside of the slab, special protection should be provided (see paragraph 2.44).

**2.24** At any points where pipes are built into a structure, including an inspection chamber, manhole, footing, ground beam or wall, suitable precautions should be taken to prevent damage to the structure. This may be achieved by

a) building in a length of pipe (as short as possible) with its joints as close as possible to the wall faces (within at most 150mm) and connected on each side of rocker pipes by a length of at most 600mm and flexible joints (see Diagram 7(a)) or

b) Forming an opening to give at least 50mm clearance all round the pipe and the opening masked with rigid sheet material to prevent ingress of fill or vermin. It is important that the void is also filled with a compressible sealant to prevent ingress of gas (see Diagram 7(b)).

**2.25** A drain trench should not be excavated lower than the foundations of any building nearby (see Diagram 8) unless either:

- where the trench is within 1m of the foundation the trench is filled with concrete up to the lowest level of the foundation, or
- where the trench is further than 1m from the building, the trench is filled with concrete to a level below the lowest level for the

