

TGN2 - DISTRIBUTION SYSTEM (NEW MAINS AND SERVICES)

Introduction

Designers, constructors, and operators of water networks should be alert to all the possible opportunities for contamination to enter supplies, and take all reasonable precautions to minimise the risk. They should equally avoid circumstances where water in the mains can deteriorate through stagnation or long contact with particular materials e.g. cement mortar pipe lining. The design and specification of the network can itself significantly reduce most of these risks.

Where distribution networks are designed and installed by self-lay organisations (SLO) water undertakers should ensure that these activities are carried out in accordance with the Code of Practice for the self-laying of water mains and services and relevant British Standards. SLOs should be members of the Water Industry Registration Scheme operated by Lloyds on behalf of Water UK and the Water Industry.

Good Practice

In developing their own policies or operating procedures, companies and SLOs should consider the following points:

1. As far as practicable, new mains should be designed to ensure adequate turnover. In particular, crossovers, “push-pull” mains or other intermittently used pipes should be avoided where possible, or at least be provided with appropriate washout facilities.
2. Networks should be designed to include all the features required for their subsequent commissioning (including sampling).
3. An assessment of the ground conditions in which the new main is to be laid should be carried out in order to identify any risks to water quality either during the laying or from permeation through the main following commissioning. For example, use of metal or barrier pipes should be used in brown-field sites where there is a risk of hydrocarbon contamination.
4. Chambers for hydrants and air valves should be sited in readily accessible locations, away from risk of spillage or surface water, and constructed as self-draining.
5. Laying new mains and services requires personnel to hold registration under an approved hygiene scheme and carry a valid water hygiene training card. Ideally, relevant personnel should have current certification to at least NVQ level 2 in Network Construction Operations.
6. Pipes and fittings should be transported and carefully stored on site, off the ground, to avoid entry of dirt or vermin. All pipes should be supplied with close-fitting end caps where feasible and these should remain in place until the pipe is laid. All pipes and fittings (and in particular plastic types) should be kept clear of fuel oils, and any materials so contaminated should be discarded.
7. All fittings and pipe ends should be free of any visible contamination and sprayed with a solution of 1000mg/l free available chlorine as they are laid.
8. Care should be taken to prevent water, subsoil or other material entering a pipeline under

construction. It should not be assumed that such material will be flushed out on commissioning. Additional cleaning measures (e.g.: swabbing) and inspection techniques (e.g.: CCTV) should be considered prior to commissioning on larger diameter mains.

9. Swabs may be useful for clearing a new main of any dirt or debris that has entered and the use of a chlorinated swab may be appropriate if any form of contamination is suspected. However, a chlorinated swab is only an intermediate measure and is not a substitute for disinfection.
10. After installation and before use, water mains should be flushed until visibly clear. They should be disinfected by charging with water containing sufficient free chlorine to ensure that a concentration of at least 20mg/L has been maintained throughout the entire pipe length over a period of standing for at least 16 hours. The time is important to ensure adequate dispersion and contact of the chlorine with the water and the entire internal surface of the main and fittings. The main should then be flushed and left charged for a minimum of 16 hours, and sampled at appropriate points, including the downstream end. The number and location of samples required should be sufficient to ensure the suitability for supply of the entire length of main.
11. Alternative disinfection methods can be considered that are equivalent to 20mg/L for 16 hours (for example, spraying the full internal length with a solution containing 1000 mg/L chlorine).
12. Chlorinated water should be discharged appropriately, including dechlorination where necessary (for example when discharging to surface water). Ref: TGN 14.
13. Samples from new mains should, as a minimum be checked for residual chlorine, taste & odour, coliform bacteria, *E. Coli*, and appearance / turbidity. Consideration should be given to including other parameters as appropriate.
14. Documentary evidence should be provided of satisfactory water quality results before the main is connected (by the water undertaker or its service partners) to the live network.
15. If the main is not brought into service within 14 days of a satisfactory sample having been taken, the main should be flushed with mains water and re-sampled. If contamination is suspected, the main should be re-chlorinated and sampling carried out as in 10 & 12 above.
16. All new service connections should be pressure tested and flushed with mains water before use. Service pipes above 50mm diameter require disinfection, although water quality samples will not normally be required. If the disinfected service pipe is not commissioned and brought into supply within 30 days of completing disinfection, the disinfection process should be repeated prior to commissioning if it is considered that deterioration of water quality may have occurred within this period.