

TGN4 - DISTRIBUTION SYSTEM (RENOVATED MAINS)

Introduction

Due its intrusive nature, the process of mains renovation represents a potential opportunity for contamination to enter the system and therefore specific precautions are needed during such work to minimise these risks. However, this planned activity also usually requires the disruption of supplies to consumers, which in itself has potential public health implications. This work should therefore be carried out in such a manner as to minimise the period during which consumers are without water, whilst at the same time minimising risk to water quality during the process. Water undertakers should therefore continue to be vigilant and recognise all possible ways in which contamination could enter water supplies.

The spray lining of pipes with an approved polymer is a frequently used method for renovating pipes. Compliance with Information and Guidance Note (IGN 4-02-02): Code of practice for the *in-situ* resin lining of water mains and the associated Water Industry Standard (WIS 4-02-01): Operational Requirements: *In-situ* resin lining of water mains is a mandatory requirement for *in situ* lining. These documents are controlled and administered on behalf of the water industry by Water UK. This TGN also provides guidance on the hygienic use of coiled polyethylene pipes and liners.

Good Practice

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

General

1. Mains renovation is a restricted operation and as such all personnel involved should be medically assessed and must be registered under an approved hygiene scheme and carry a valid water hygiene training card.
2. All fittings and pipe cut ends should be spray disinfected with a solution containing at least 1000mg/L of free available chlorine ensuring that all surfaces are coated. The pipe should be capped until connected.
3. Where pipes are being installed using a heat reversion process the heat generated can be considered to bring about *in situ* disinfection. However, all fittings and pipe cut ends should be spray disinfected with a solution containing at least 1000mg/L of free available chlorine.
4. All pipes and fittings should be stored, transported, installed and connected in ways which minimise the risk of contamination (e.g.: from groundwater or other materials) from entering them.
5. In cases where the newly installed or lined pipe may have become contaminated, the need for further disinfection and/or precautionary boil advice notices should be assessed in accordance with company practice. An individual risk assessment should be carried out on each such occasion to determine whether measures are required to protect public health and what these should be. Companies should have appropriate procedures to deal with instances of contamination when they occur to ensure that at no time are customers' water supplies at risk. Typically, these procedures should include isolation of properties from the contamination, communication with customers, communication with the appropriate regulatory bodies, methods of removing the contamination, methods for the

disinfection of all apparatus and an appropriate sampling regime.

6. Companies and their contractors should have appropriate procedures and method statements for the specific rehabilitation technique employed.

Spray Lining

1. Lining of mains with polyurethane (PU) should be carried out in accordance with the aforementioned WIS and IGN.
2. Lining work should be carried out with approved materials which should be applied in accordance with the manufacturer's instructions for use. It should only be applied by accredited contractors in accordance with specified conditions of approval.
3. Spray lined mains should be disinfected by either one of the following methods:
 - a) disinfection by "fill and stand" – a free chlorine concentration of 50mg/L for a minimum of 30 minutes should be used. A significant reduction in chlorine concentration using this method over the contact period may indicate a dirty or otherwise contaminated pipe; or
 - b) spray disinfection – a specially designed chlorine spray-lining unit designed to completely wet the entire internal surface of a relined main with 1000 mg/l should be used. The main should be left for a minimum of one hour before flushing.

The main may be returned to service following recharging and checks on residual chlorine concentration.

4. A sample should be taken following the return to service of each renovated section of main.

Coiled Polyethylene Pipes or Liners

1. Where coiled polyethylene pipes or liners are to be installed within an existing main, either close or loose fitting within the existing pipe or by insertion through pipe-bursting or created by directional drilling, one of the following disinfection procedures should be followed:
 - a) pre-disinfected with free chlorine levels of 20mg/L for 16 hours (or equivalent), flushed and then recharged with mains water for a further 16 hours before sampling at appropriate points and written approval obtained before being brought into service. A significant reduction in chlorine concentration using this method over the contact period may indicate a dirty or otherwise contaminated pipe; or
 - b) disinfection for a minimum of 50mg/L of free available chlorine for 30 minutes followed by flushing and sampling prior to being returned to service. A significant reduction in chlorine concentration using this method over the contact period may indicate a dirty or otherwise contaminated pipe; or
 - c) use of factory sealed and pre-disinfected pipes (supplied with a manufacturers expiry date) with the seal remaining intact until the pipe is ready to be installed; or
 - d) treated as a new main installation and disinfected accordingly (see Technical Guidance Note 2)
2. The risk of contamination during the installation of pre-disinfected coiled pipe (e.g.: loss of sealed cap through "pulling" main) should be assessed. Where the pipe is suspected to have become contaminated during installation, further cleaning and disinfection methods should be considered.

3. Factory-sealed coiled pipe should be installed within 6 months of the disinfection/sterilisation date. Where the 6 month period has been exceeded, the pipe should be re-chlorinated.
4. Where a pre-chlorinated coiled pipe has been cut or there is any doubt about the disinfection status of the pipe, or it is suspected that contamination has occurred, then the coil should be re-chlorinated.