Tank Clean and Disinfection Method Statement

This method statement has been prepared for Suppliers tendering for work that includes the Clean and disinfection of cold water tanks in accordance with ACOP L8, HSG274,HTM04-01, BS8558:2015 and PD 855468:2015.

This Method Statement deals only with the Technical and Hygiene Aspects of Tank Cleaning and Disinfection. It does not include any requirements for Health and Safety or access equipment/arrangements etc. Its use is limited to parity of tendering to ensure all tenderers are pricing for the same Cleaning and Disinfection Quality of Service. The tenderer must satisfy themselves that they have allowed for any other requirements beyond this Method Statement.

The document that should be followed for disinfection is (PD 855468). For tanks and systems, the chemical stated is Sodium Hypochlorite at (50mg/l). Sodium Hypochlorite is sensitive to both temperature and pH, the tables within PD 855468 should be adhered to for pH, temperature and contact time.

The paragraphs in the Method Statement are not necessarily in a sequential order.

All personnel involved with cleaning and disinfecting tanks must be fully conversant with water hygiene and have attended the EUSR water hygiene training or similar. Evidence of such training will be required.

Tenderers to satisfy themselves that they fully understand the requirements of this method statement and price accordingly. Anything that is considered unclear or ambiguous etc should be raised with Engie prior to submitting or confirming a price.

1 Preparatory Work

1.1 Supplier to advise Engie of chemicals to be used in the cleaning and disinfection process e.g.

- Detergent
- Disinfectant – Preferred chemical is Sodium Hypochlorite. Any proposal to use an alternative disinfectant must be discussed and agreed with the Engie RP and AE Water
- Disinfectant neutraliser

NOTE: To include the safety data sheet and approvals for use in contact with drinking water.

1.2 Disposal instructions for water/effluent/chemicals that were agreed at the survey stage must be verified prior to commencing work and the local water authority informed if required.

1.3 Technicians to suit up in disposable clean coveralls at this time.

1.4 Check that the Chlorine to be used has not been opened for greater than 6 months, or if sealed that it has not exceeded 12 months past its date of manufacture.

1.5 Ensure any fitted water treatment and monitoring systems have been physically isolated.

1.6 If pump sets are fitted to the system electrically isolate before physically isolating the valves.

1.7 Identify which equipment is required to effectively clean the tank, this would include identifying where full access is not possible. Where full access is possible then ‘non-abrasive’ handheld cleaners / brushes can be used, however where tank access is not permitted then telescopic brushes should be used.

1.8 Prepare the work area by laying down disposable sheeting sufficient for tank lids, removeable parts and work equipment (i.e., brushes, scrubbers etc…). Where this cannot be done in the vicinity of the tank due to space restrictions the chemicals and cleaning equipment should be prepared in the rear of the technician’s vehicle. Where transferring mixed solutions of chemicals from the vehicle to the tank the tightly fitting lid must be fitted to prevent accidental splashes while in transit.

1.9 Prepare a fresh solution of 1000mg/l chlorine solution by following the chemical manufacturer’s instructions, mix in a labelled spray bottle, seal then swirl to mix.

1.10 Spray all cleaning equipment with the 1000mg/l chlorine solution.

1.11 Spray all disposable plastic sheeting with the 1000mg/l Chlorine solution and leave to disinfect for 15 mins.

1.12 Next prepare a detergent solution and mix in a second labelled spray bottle, seal then swirl to mix.

2 Test the pH of the water

2.1 Spray and clean the tank lid and surrounding area using the chlorine solution to minimise any debris entering the tank

2.2 Remove the tank lid or hatch and place on disinfected disposable plastic sheeting along with any removeable parts of the tank which are to be cleaned.

2.3 Ensure the pH measuring device has been calibrated (where required) as directed by the manufacturer's instructions.

2.4 Test the pH of the water system using a calibrated pH measuring device and record on the Clean & Disinfection report.

2.5 If the pH is within the range 6.5 - 8.0 proceed with the cleaning and disinfection.

2.6 If the pH is <6.5 or >8.0 in the system and the make-up water is 6.5 - 8.0 drain, flush and refill the system with the mains/supply water.

2.7 On completion of refill, re-test the pH. If the pH is within the range 6.5 - 8.0 proceed with the cleaning and disinfection.

2.8 If all the water in the system and mains has a pH <6.5 or >8.0 **STOP** and advise local Engie staff who must in turn consult the Engie AE Water

3 Preparing the tank for the clean

3.1 Isolate the water tanks, including inlets and outlets and drain.

4 Clean and Inspect the Tank

4.1 Take a photograph of the tank externals as a before clean record.

4.2 Spray the tank lid / hatch and any removable parts with the detergent solution and using the disinfected hand brushes clean taking care not to damage or scratch the parts.

4.3 The action of cleaning the tank lid / hatch and removeable components is likely to produce standing water on the disposable sheeting, therefore a wet-vac should be used to remove the liquid to prevent excess water being generated and potentially flooding the work area.

4.4 Once the tank lid / removeable parts have been cleaned to a satisfactory standard rinse over the tank with copious amounts of water to ensure all detergent has been removed, taking care not to agitate the water significantly as this can create excess foam.

4.5 Next place the tank lid / hatch and any removeable parts on the disinfected disposable sheeting and spray with the 1000mg/l Chlorine solution.

4.6 Take a photograph of the tank internals as a before clean record.

4.7 Spray the internal surfaces and non removeable parts with the detergent solution.

4.8 Physically clean all internal parts of the tank including the lid, fittings, and ball valve etc. by manual cleaning using the equipment identified earlier – hand brushes and 'non-abrasive' cleaners for accessible tanks and telescopic brushes for 'non-accessible' tanks.

4.9 Clean the following external parts of the tank to remove any dust or loose materials to avoid contamination of tank:

- around the tank lid
- Ladder to tank top and other access routes to the tank
- Any areas used for storage of cleaning materials

4.10 Use disposable towels to dry the areas above and remove any final dirt / grime, these are to be disposed in refuse sacks.

4.11 Visually inspect the overflow screens and lid vents ensuring they are free from blockage. All openings to atmosphere, overflows, weirs, warning pipes and vents, all must be checked and cleaned as necessary. Any defects to be immediately reported to Engie. The insect mesh @ 0.65mm max is vital to prevent insect infestation. If this is damaged in any way then Engie must be informed before leaving site.

4.12 Rinse all internal surfaces of the tank with supply water taking care to avoid excessive agitation and remove residue from the tank.

4.13 Take a photograph of the tank internals and externals as an after clean record.

5 Disinfect the Tank

5.1 Take measurements up to the level of the overflow (or 5cm's above the operation level) and calculate the volume to be used to calculate the amount of chlorine which needs to be added.

NOTE[1]: the above calculation is not the maximum volume of the tank.

NOTE[2]: Where the ball-valve has been lowered to reduce water storage and ensure correct turnover, any alterations should be noted and put back to the same position before leaving.

5.2 Verify the volume of water in the tank and calculate the volume of Sodium Hypochlorite required to achieve 50ppm of free chlorine in the tank taking into account the measured pH of the water. The volume of the tank must be recorded on the Clean and Disinfection report. Record calculation, results obtained, and volumes of product used. This must then be checked that the correct strength has been achieved by testing with an appropriate chlorine measuring device.

NOTE: 50ppm of free chlorine is a maximum value and should not be exceeded as high levels of chlorine have a detrimental effect on plastic, metal and tank seals etc.

5.3 Take water temperature. There is an approximate 5% difference in available HOCl between 10 °C and 25 °C, so contact times should be extended by 10% for every 5 °C increment in temperature above 20 °C irrespective of the pH of the dosed water.

5.4 Always ensure there is at least 100mm of water in the tank before adding any Sodium Hypochlorite. This is to ensure that the high strength chlorine solution does not come into direct contact with the plastic of the tank

5.5 Fill tank to maximum capacity, adjusting the ball valve/level control as required, calling on support from Engie staff where required.

5.6 Test the dosed water in the tank to confirm the required level of free chlorine has been achieved using a chlorine measuring device. If the desired level of 50ppm has not been achieved add sufficient Sodium Hypochlorite to achieve 50ppm. The solution will have to be agitated to mix and in larger tanks a submersible pump and hose arrangement may be required to mix the solution.

5.7 Measure the pH of the water in the tank to calculate the disinfectant 'contact time' using the table in Appendix 1.

5.8 Leave chemical to disinfect for time indicated in Appendix:1.

6 Check the effectiveness of the Clean and Disinfection

6.1 At the end of the disinfection, the free chlorine is to be checked using the chlorine measuring device. If the concentration of free chlorine is below 30 mg/litre the **clean and disinfection process has to be repeated**.

6.2 Appendix 2 provides exemplar photographs of:

- a tank that is considered acceptably clean following a tank clean and disinfection
- a tank that would be rejected and the contractor requested to clean and disinfect the tank again.

7 Neutralise the Disinfectant

7.1 At the end of the disinfection, the remaining chlorine in the tank requires neutralising and confirmation that chlorine level is no greater than 1ppm before discharge to a suitable foul drain.

8 Return the System to normal

8.1 Re-attach the tank lid / hatch and any other parts which had been removed and spray Chlorinate with the 1000mg/l solution.

8.2 Refill the tank and return the system to full service capability ensuring all inlet and outlet isolation valves have been reopened.

8.3 Reinstate any isolated equipment in consultation with Engie staff, e.g. biocide dosing.

8.4 Leave the work area clean and tidy

8.5 Return all remaining chemicals and empty drums to the vehicles.

8.6 Remove hazard-warning signs.

8.7 Ensure all waste and contractor owned equipment is removed.

8.8 Make sure that once the tank has filled the make-up float mechanism has isolated the water correctly and that no water is overflowing from warning pipe etc.

8.9 Complete disinfection certificate recording all free Chlorine levels, disinfectant quantity added and disinfection levels after contact period i.e. (50ppm 45ppm after contact period). pH of the water before and after filling, temperatures of the water after filling.

8.10 Report to Engie any faults, findings or observations that may have a detrimental effect on the water systems, building or building occupants.

8.11 Advise client of completion of works and of any non-conformances or water system mechanical defects.

8.12 Update records and send completed paperwork to Engie.

8.13 Return all keys to the appropriate person.

9 Post clean and Disinfection Sampling

The following must be undertaken by an organisation independent of the Cleaning and Disinfection company:

9.1 Take water samples from the tank 48 hours after disinfection to allow any bacteria to recover.

9.2 Such samples should not be taken by dipping the tank; but via a tank sample point (as a post flush). In the absence of a tank sample point, this must be taken from the nearest domestic outlet to the tank as a post flush as described within BS 7592.

9.3 Samples should be analysed for total viable counts (TVC) measured at 22 °C and 37 °C; Coliform bacteria; E. coli; Pseudomonas aeruginosa; Legionella (species)

Appendix 1: Contact times for pH value of 7.6 and above

pH of water	Contact time in Hours
7.6	1
7.7	1.25
7.85	1.67
8.0	2.50
8.45	5.00

Appendix 2: Exemplar tank photographs

Acceptable	Unacceptable (sediment remaining in tank)