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SECTION TWO/FOUR

GENERAL TECHNICAL SPECIFICATION

STERILISATION AND WATER TREATMENT

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SECTION TWO/FOUR

GENERAL TECHNICAL SPECIFICATION

STERILISATION AND WATER TREATMENT

2.4.1 STERILISATION OF SYSTEMS

The purpose of water treatment, sterilisation and chlorination is:

a. To protect the installation/plant from corrosion, sludge formation, bacterial contamination (including Legionella) and limescale formation (hard water areas)

b. To ensure acceptable comfort condition and a healthy atmosphere.

The works covered in this section shall be carried out by one of the Specialists indicated with the assistance of the Contractor. It is the sole responsibility of the Contractors to ensure that his and the Specialist's work meet the requirements specified in this document and any relevant regulations.

It is the Contractor's responsibility to allow in his price for all works/materials, including expenses etc., by the Specialist and all costs for the Contractor's attendance and works. It is the Contractor's responsibility to organise and co-ordinate these works with the programme, his and the Specialist's work.

Immediately prior to handover, (or at such time as the installations cannot be recontaminated prior to handover) the Contractor shall arrange for the Specialist to thoroughly and efficiently sterilise all mains, boosted and tank cold water services and all domestic hot water systems including all storage tanks and vessels. Sterilisation shall be carried out in accordance with BS 6700. The Contractor shall notify the Consulting Engineer of the date when sterilisation takes place and submit certificate without delay.

Records of all procedures and tests adopted shall be made by the Specialist and submitted to the Consulting Engineer by the Contractor.

Following sterilisation, the systems shall be flushed of all chemicals and refilled with fresh cold water and all air removed from the systems by the Contractor under the supervision of the Specialist. The procedures recommended by the Specialist to prevent water stagnation and to assist build up of protective internal films shall be continued until handover by the Contractor. The Contractor shall allow in his Tender for the taking of two sets of water samples by the Specialist from the sterilised system, one set immediately after sterilisation and one set immediately prior to handover. Copy of the results shall be submitted to the Consulting Engineer by the Contractor.

The method of obtaining samples, sampling points, etc., shall be recorded by the Specialist and witnessed by the Contractor. The Contractor shall allow in his price for analysing the samples by the relevant Public Health Authority, local water undertaking, or any qualified laboratory in whose area the project falls, to confirm that the water from the installation is safe for human consumption, and free from harmful bacteria/chemicals. The original copy plus two additional copies of the test reports shall be forwarded to the Consulting Engineer. Samples must be taken immediately after the work has been carried out and sent to the testing laboratory without delay.

Tests shall include microbiological analysis including Coliform 'B', E. Coli and TVCC (total viable colony count) and chemical analysis to indicate the copper content of the water in mg/1 (p.p.m.). Directive 80/778/EEC must be observed.

The methods used to test the samples shall be in accordance with those laid down in "Analysis of raw, potable and water waters" published by the Department of the Environment, HMSO 1972 or any method approved and employed by the Public Health Authority at the time of tests.

2.4.2 WATER TREATMENT

LOW PRESSURE HOT WATER HEATING SYSTEMS

Following pressure testing, the systems shall be thoroughly flushed out with water in order to remove gross debris which may typically include grit, sand, silt, jointing compound etc.,

The Contractor shall ensure that during the flushing operation, sufficient water velocity is obtained to achieve the above objective. Building Services Research and Information Association (BSRIA)
Application Guide 8.91 shall be observed. The Specialist must ensure that these works have been carried out to his satisfaction.

Following the successful completion of the flushing operation, the system shall be chemically pre-cleaned and then chemically passivated, by the Specialist.

SYSTEM PRE-CLEANING

Immediately after pressure testing and flushing the system shall be refilled with clean water by the Contractor to the satisfaction of the Specialist. During the refilling operation, a suitable non-acidic rust removal chemical additive shall be added by the Specialist.

When filled and dosed to the correct concentration with he rust removal chemical additive, the water shall be circulated through the system for a period of time to suit the Specialist's requirement.

Upon the advice of the Specialist, the system shall be drained of cleansing

liquor by the Contractor. Where it is not possible to drain the system due to it's size and complexity BSRIA guidelines shall be followed which recommend a balanced dynamic flush to avoid ingress of air. The Specialist advice shall be followed by the Contractor.

For convenience, draining and re-filling procedure can be performed on a 'balanced' basis i.e. the system can be re-filled as it is being simultaneously drained. These works are to be coordinated and agreed between the Specialist and Contractor.

SYSTEM PASSIVATION

Immediately after the pre-cleaning and draining operation described above, the system shall be refilled with clean water. For convenience, draining and refilling procedure can be performed on a 'balanced' basis i.e. the system can be re-filled as it is being simultaneously drained. These works are to be co-coordinated and agreed between the Specialist and Contractor.

When refilled with clean water, a suitable passivating chemical shall be added by the Specialist via a dosing pot installed by the Contractor. The water shall be chemically analysed by the Specialist in order to ensure that the correct amount of passivating chemical has been added. A copy of the test results is to be submitted to the Consulting Engineer by the Contractor.

The function of the passivating chemical is to chemically modify the metal surface of the heating system and thus render it considerably less vulnerable to corrosion and fouling. This will enhance the thermal performance and life expectancy of the system.

Where treatment is identified by the Specialist of being necessary, the following applies:-

a. For Cuprosolent Waters: The Contractor shall allow in his price for the supply and installation of a suitable dosing system for the inhibition of copper corrosion within the hot and cold water services as recommended by the Specialist.

b. For Scale Forming Waters: The Contractor shall allow in his price for the supply and installation of a suitable dosing system for the reduction of limescale formation within the hot and cold water services as recommended by the Specialist.

Note: The Contractor shall allow in his price for the supply and installation of suitable dosing pots/injection pumps in locations recommended by the Specialist.

Flushing, cleaning , disinfecting, venting and chemical cleaning must be completed before commissioning begins.

The Contractor shall allow in his price for minimum of four visits by the Specialist during the 12 months defects period, to undertake water analysis and replenish the chemical reserves of all systems as may be necessary and recommended by the Specialist.

All fan coils, valves, boilers and other sensitive items which may be prone to chemical damage of blocking by debris in transit, must be isolated, by-passed or completely removed and replaced by a stool piece to ensure system flow continuity.

It is the responsibility of the Specialist to establish, prior to carrying out the works specified in this document, the type and nature of the various system components. This is to ensure that the various chemicals he proposes to use are suitable for the system actually installed.

Particular attention is drawn to installations with Aluminium Components, e.g. Aluminium Alloy Boiler Heat Exchangers. Water quality, flushing, pre-cleaning agent, inhibitor and PH must be correct to avoid causing breakdown of the protective oxide film leading to corrosion and/or pitting.