DEPARTMENT OF PUBLIC WORKS

FIRE SECURITY

STANDARD TECHNICAL SPECIFICATION

FOR AN

AUTOMATIC SPRINKLER FIRE EXTINGUISHING SYSTEM

STS 12
REF: FPO 7E
OCTOBER 1981

STANDARD TECHNICAL SPECIFICATION

FOR AN

AUTOMATIC SPRINKLER FIRE EXTINGUISHING SYSTEM

CONTENTS

STANDARD TECHNICAL SPECIFICATION

FOR AN

AUTOMATIC SPRINKLER FIRE EXTINGUISHING SYSTEM

1. GENERAL

This standard specification deals only with the general technical requirements for an automatic sprinkler fire extinguishing system. Tenderers are therefore referred to the Supplementary Specification for the particular scheme for the specific requirements applicable to the scheme.

2. DESIGN OF SPRINKLER SYSTEM

The rules and regulations (latest edition) as laid down by the Automatic Sprinkler Inspection Bureau ("A S I B"), hereafter referred to as the "Rules", shall apply.

3. DIAMETERS OF SPRINKLER PIPES

The sizes of all distribution pipes shall be designed hydraulically in accordance with clause 2 above.

In the case of extra high hazard protection the sizes of the branch pipes shall be determined in accordance with the applicable tables in the "Rules" unless specified otherwise in the Supplementary Specification.

The Contractor may submit a design based on full hydraulic calculations, but the Department is not bound to accept such an alternative.

Tenderers are to note that they are to tender strictly in accordance with the Department's requirements.

Tenderers shall attach their calculations to their tender.

4. DRAWINGS AND APPROVAL

A suitable layout for the required sprinkler installation is indicated on the Department's drawings referred to in the Supplementary Specification. The tender drawings shall be returned with the tender and any deviations from the Department's layout proposed by the tenderer shall be indicated thereon in RED.

Tenderers are to note that they are required to tender strictly in accordance with the layout of the Department.

In cases where air conditioning ducts, lights, etc., are being installed in the space to be protected, the successful tenderer shall consult the Regional Representative for any information in this connection before completing his detailed working drawings so as to ensure that the sprinkler system does not clash with any of the other services being installed.

Approval by the Department of the proposed detailed working drawings shall not reduce the contractor's responsibility in respect of the accuracy of his dimensions and the clashing of the system with other services or elements.

5. WATER SUPPLY

A single water supply connection terminating in a plugged socket in the sprinkler valve cupboard, in accordance with the drawings, will be supplied by others. The sprinkler contract is to commence at this point.

6. SPRINKLER CONTROL VALVES

A complete set of approved sprinkler control valves shall be supplied and connected to the plugged connection referred to in Clause 5. The control valves shall be of the "WET" type.

The sprinkler control valves shall be of a type approved by the Automatic Sprinkler Inspection Bureau (A S I B) particularly in regard to their general assembly, namely the size and arrangement of ancillary equipment; drain valves, test and alarm cocks, pressure gauges and hydraulic alarms, etc. The direction of rotation of the main stop valve spindle and the "OPEN" and "SHUT" indicators attached thereto must also con-form to the above requirements. The stop and alarm valves shall be flanged.

An electrically operated booster pump shall be included and hydraulically coupled through the control valves for the purpose of boosting the pressure in the sprinkler system after alarm tests have been carried out, except where the water supply is dependent on a pumping system in which case a booster pump will form part of the pumping installation.

The capacity of the pump shall be not less than 9 litres per minute and it shall be capable of boosting the pressure in the installation to not less than 150 kPa above the maximum available water pressure.

The pump shall be provided with both a stop valve and a non-return valve on the delivery side and also a stop valve on the suction side.

The necessary electrical supply in the form of a 15 amp standard plug and switch will be provided by the Department in the sprinkler valve cupboard.

Provision shall be made for both manual and automatic starting and stopping. The latter shall be activated by means of a pressure switch. An amber flashing light, which will flash while the pump is operating, shall be installed in a suitable position above the control valve cupboard.

Where there is more than one sprinkler control valve in the same valve cupboard, each shall be served by a separate booster pump.

7. PRESSURE GAUGES

The two pressure gauges required for the installation shall be not less than 100 mm diameter with porcelain faces registering 1 500 kPa. They shall be so connected to the control valves that one registers the pressure in the municipal supply and the other the pressure in the system.

Their connections shall be taken from purpose made outlets on the valves and shall comprise a "U" tube without any fittings (elbows etc.) with all bends neatly executed. The gauges shall be fitted upright with brass shut-off cocks or other approved means of shut-off so as to permit their removal under pressure, if required.

8. HYDRAULIC ALARMS

In order to ensure smooth operation of the alarm, it shall be provided with grease packed ball races or self-lubricating sleeve type bearings. Full details shall be provided with the tender.

9. MATERIALS

All piping, fittings and valves used in the installation shall be new and of an approved type capable of withstanding a test pressure of 2 000 kPa.
All piping shall be non-galvanised mild steel manufactured in accordance with SABS 62 (medium grade), unless otherwise specified and shall be of an approved brand and the best obtainable. All pipes shall be free of rust, flakes or other faults.

Notwithstanding the above stipulations, all underground pipes shall be galvanised in accordance with SABS 763.

10. PIPE JOINTS

All threaded pipe joints shall be made with an approved cold water pipe-jointing compound and flanges when used shall be bolted together with approved gaskets. Pipe threads shall be standard right-hand Whitworth. Mechanical pipe-joints i.e. "Klambon" or other pipe joints approved by the Department may be used provided they have been approved by the Automatic Sprinkler Inspection Bureau (A S I B) and are installed strictly in accordance with the instructions of the manufacturer.

11. WELDING

Welding in situ without the prior permission of the Department will not be permitted. If welding of any joint or joints is necessary on the site the reasons for this shall be clearly stated in the tender. Welded joints shall be properly machined and the use of a welding torch for making holes shall not be permitted.

Distribution pipes with welded crosses and tees shall be provided with female thread so that the branch pipes can be connected in the conventional way. Where pipe lengths exceed 14m they shall be fitted with flanges.

All welded joints shall be hydraulically tested to 2 000 kPa. Welded joints in branch pipes will not be permitted.

12. PREVENTION OF AIR LOCKS

In order to prevent the lodgement of air, a proper inclination of pipelines shall be maintained throughout the work.

13. DRAINS AND DRAIN COCKS

Suitable drainpipes shall be provided for the 50mm outlet on the control valves and the 32mm outlet on the hydraulic alarms.

Where distribution pipes are lower than the control valves, each separate section of the system shall be provided with a 20mm drain pipe. The pipe shall be properly secured to the wall and roof and carried down and plugged within 2 metres of the floor.

14. SLEEVES AND PIPE SUPPORTS

Where sleeves and/or pipe supports are shown on the Departmental drawings, these will be provided by others.

All pipe supports, clamps and other suspension fittings shall be supplied and installed by the sprinkler contractor. Distribution and branch pipes shall be properly secured and branch pipes shall be anchored within 0,7m from the last sprinkler head.

The Tenderer is required to provide a drawing showing full details of the sizes and manner of the suspension fittings, to the Department for its approval.

15. SPRINKLERS

All sprinklers which the contractor intends using shall be approved by the Automatic Sprinkler Inspection Bureau (A S I B).

Unless otherwise specified in the Supplementary Specification the temperature rating of the sprinklers shall conform with clause 4030.

The sprinkler shall not be older than two years at the date of installation. The date of manufacture of the sprinklers intended to be used, shall be stated in the tender.

16. HEAT COLLECTORS

Where, for any reason whatsoever, it is necessary to install sprinklers under a roof or ceiling at a level lower than that permitted by the "Rules", heat collectors shall be provided.

The heat collectors shall be 500mm x 500mm of 3mm mild steel and securely fixed.

17. STACKING HEIGHT INDICATORS

Stacking height indicators shall be provided wherever the maximum stacking height differs from the general maximum stacking height of 4 metres for ordinary hazard protection.

Such indicators shall be in 50mm red letters on a white background on a steel or aluminium plate. The bottom of the indicating plate shall be fixed 1,5 metres above the floor level.

Where a restriction if applicable to certain materials, which are normally, stored in a protected area, such as wood or rubber products, the restrictions regarding the particular product shall be indicated.

It is also necessary to indicate the restrictive heights in 15mm wide red stripes, around all columns and on all walls at distances not more than 15m apart. The applicable height shall be indicated at the stripes in 50mm red letters, as follows: "3m" or "6m" depending on the applicable standards.

18. BLOCK PLAN

The block plan should be in black engraved letters on white perspex or stainless metal plate such as aluminium or stainless steel.

The block plan shall indicate only the buildings protected by the systems, which are served by the control valve or -valves in the particular valve cupboard. Should a building be served by valves in more than one valve cupboard, the block plan shall be provided in all valve cupboards with a clear indication of the position of the particular valve cupboard.

19. ALARM BELL DRAIN PIPES

The drainpipes of each alarm bell shall be taken to a point where the discharge will not cause any damage.

Where there is more than one control valve in the valve cupboard the drainpipes shall be kept completely separate up to the point of discharge.

20. TESTING

The sprinkler installation shall be tested to a hydraulic pressure of 1 000 kPa and any defect made good.

21. PAINTING

Painting of all portions of the sprinkler installation, including all hangers, valves and hydraulic alarms shall form part of the sprinkler contract.

Before painting is undertaken, all work shall be thoroughly cleaned of rust, scale, etc., by brushing with a stiff wire brush wherever necessary. A prime coat of high-quality zinc chromate primer shall be applied before delivery to the site. After installation, all fittings shall also be primed with zinc chromate primer and where the primer has come off the pipes, these shall be re-primed whereafter two coats of high gloss paint shall be applied. Unless otherwise specified, the colour of the high gloss paint shall be similar to No. D 30 Post Office red of CKS 279. The final coat of paint shall be applied only after the system has been tested and the ceilings have been painted. The final coat shall not be applied without the express consent of the Engineer. Pipe supports and other fittings, which are not directly in contact with the pipe work, shall be painted the same colour as the ceilings or beams. The Engineer is to be consulted in this regard.

The hydraulic alarm shall be painted with a prime coat and two coats of high gloss red paint as stated above. The words 'FIRE' and 'BRAND' shall appear thereon in white letters, 100mm in height. Should the construction of the alarm be such that it is impossible or difficult to paint the letters thereon, these shall be painted on a suitable steel plate and attached to the wall in a clearly visible position.

22. SPARE SPRINKLERS

Spare sprinklers together with an approved sprinkler key, shall be provided in an approved cabinet fitted with an approved lock and two keys and the whole neatly mounted alongside the control valves in the cupboard.

The number of spare sprinklers to be provided shall be in accordance with Clause 4040 of the rules and regulations (latest edition) as laid down by the Automatic Sprinkler Inspection Bureau (A S I B).

23. FRAMED INSTRUCTIONS

A diagrammatic instruction chart clearly indicating the procedure for operating the sprinkler valves, in both official languages, shall be mounted in a strong teak or approved metal frame with Perspex front on the inside of the door to the valve cup-board. The minimum design pressure of the system shall be clearly indicated on the chart.

24. OPERATING AND MAINTENANCE INSTRUCTIONS

Full installation operating and maintenance instructions shall be supplied in triplicate with each system and shall include schematics and detailed wiring drawings with a full component list indicating not only component values but sources of supply. Equipment will not be accepted until this information has been handed to the Department.

25. CUTTING OF PIPES

Contractors using conventional pipe cutters are warned that all burrs and lips are to be removed by proper reaming of the cut end before threading to ensure that the original diameter is obtained. Any pipes with ends of reduced diameter found on the site shall be removed and the Contractor may be required to dismantle completed work so as to convince the Department that no such pipes were used elsewhere in the installation.

26. INSPECTION AND MAINTENANCE

Tenderers shall provide and allow for a full inspection of the sprinkler installation by the Automatic Sprinkler Inspection Bureau (A S I B) or any other organisation recommended or approved by the Department, before the date of the initial taking over of the system.

Tenderers shall also provide and allow for three complete inspections with alarm tests every three months and for alarm tests only during the other eight months of the period of free maintenance, as specified in clause 23 of P W 60.

All such inspections and tests shall be carried out by the Automatic Sprinkler Inspection Bureau (A S I B) and not by the Contractor.

27. INFORMATION REQUIRED WITH TENDER

Tenderers shall supply the information as requested in the Schedule of Equipment and Materials which is attached to this specification as an annexure, together with their tender.

Should a Tenderer fail to do so his tender may be disqualified.

28. MAINTENANCE CONTRACT

After the completion of the required maintenance period the Department may insist on entering into a comprehensive maintenance contract with the installer for a period which may vary between one and five years at the sole discretion of the Department.

ANNEXURE A TO THE STANDARD TECHNICAL SPECIFICATION FOR AN AUTOMATIC SPRINKLER INSTALLATION

SCHEDULES OF EQUIPMENT AND MATERIALS

Item No. 1 Sprinklers

(a) Make .....

(b) Country or origin.....

(c) Date of manufacture.....

(d) Material .....

(e) Approved by .....

Item No. 2 Piping Fittings

(a) Make ....

(b) Country of origin ....

(c) Quality ....

Item No. 3 Hydraulic Alarm

(a) Make .....

(b) Country of origin .....

(c) Approved by .....

(d) Material of body .....

(e) Material of turbine .....

(f) Diameter of turbine ..... mm

(g) Type of bearings .....

(h) Method of lubrication .....

(i) Diameter of gong .....

(j) Material of gong .....

(h) Mass of alarm complete ..... kg

Item No. 4	Stop Valve	Alarm Valve
(a) Make	.....	.....
(b) Country of origin	.....	.....
(c) Approved by	.....	.....
(d) Material of body	.....	.....
(e) Material of moving parts	.....	.....
(f) Type of seat	.....	.....
(g) Hydraulic test pressure	.....kPa	..... kPa
(h) Mass	..... kg	..... kg

Item No. 5	Booster Pump and Motor	
(a) Make of pump	.....	
(b) Country of origin of pump	.....	
(c) Make of motor	.....	
(d) Country of origin of motor	.....	
(e) Type of motor and number of phases	.....	
(f) Rated power of motor.	.....	KW
(g) Pumping yield at 20m head	.....	l/m
25m head	.....	l/m
(h) Material of casing	.....	
(i) Material of impellers	.....	
(j) Number of impellers	.....	
(k) Type of glands	.....	
(l) Type of bearings in pump and motor	.....	
(m) Make and type of starter	.....	
(n) Maximum starting current.amp	.....	
(o) Amperage at full load.amp	.....	
(p) Total mass of pump and motor.	.....	Kg