
SECTION 1 : TECHNICAL SPECIFICATION FOR FIRE FIGHTING SYSTEM

SCOPE OF WORKS

The works to be included in this Specification are as listed hereunder: -

- 1) Supply, deliver, install, test and commissioning of the **Fire Fighting System**, but not limited to the following: -
 - a) Portable Extinguishing System
- 2) Service and Maintenance.

Servicing and maintaining the above mentioned system for a period of one year from the date of handing over in good operation condition.

Standard Required.

The fire fighting and fire alarm installations and appliances shall conform to the following standards or equivalent standards: -

- a) Hydraulic Hose Reel System - B.S. 5306 Pt 1: 1967.
- b) Fire Alarm System - F.O.C. Rules 1984.

All wiring, piping, conduits shall be run concealed/hidden.

All fire alarm equipment/materials included in this contract shall be approved by the Jabatan Perkhidmatan Bomba Dan Penyelamat Malaysia or any other body having jurisdiction over the installation. The successful tender shall submit to the Superintending Officer copy of Letters Of Approval for the equipment/materials by the relevant approving bodies before commencement of installation work.

SECTION 2: TECHNICAL SPECIFICATION

A. PORTABLE FIRE EXTINGUISHER

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B. PORTABLE FIRE EXTINGUISHER

1. GENERAL

The Sub-contractor shall install and obtain approvals for the portable extinguishers as described in the specification and in the position indicated in the tender drawing.

The Sub-contractor is also required to provide bracket, bolts, etc., for hanging of the extinguishers in the fixed location and height as specified and indicated in the Tender Drawing.

2. DRY POWDER EXTINGUISHER

The dry chemical powder extinguisher shall be capable of extinguishing class A, B and C fire. It shall be non-toxic, non-corrosive, non-abrasive and non-freezing. It shall not solidify or evaporate during storage and conform to BS 3465. The dry chemical powder shall be expelled by compressed air or gas.

3. CARBON DIOXIDE EXTINGUISHER

Carbon dioxide extinguishers shall conform to BS 3465. It shall be supplied with horn, hose and valve assembly. The carbon dioxide gas shall be effectively used against class A, B, and C fire and does not deteriorate with storage of freeze in the container. After used, the carbon dioxide gas shall disperses without leaving any contamination or corrosive residue and will not damage clothing, equipment or material.

4. MARKING

The following marking shall be indicated on portable extinguisher:

- a) Type and weight of charge
- b) Brief instruction on how to use the extinguisher
- c) Date of manufactured
- d) Expiry date
- e) Test pressure
- f) Serial number
- g) Manufacturer

5. APPROVAL

All portable extinguisher installed shall be inspected, tested and approved by the Jabatan Bomba Dan Penyelamat Malaysia. The Sub-contractor shall pay all such fees in connection.

SECTION 2 : **COMPREHENSIVE SERVICE AND MAINTENANCE**

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SECTION 2

COMPREHENSIVE SERVICE AND MAINTENANCE

2.1 GENERAL

The work covered by this Specification is for the apply of all materials, appliances, labour and necessary incidentals for the service and maintenance of the Complete Fire Fighting System and Ancillary Equipment.

All work to be performed under this Specification under this specification shall be in accordance with the commercial practice, and must be in strict accordance with this Specification.

2.2 WORKMANSHIP AND MATERIALS

The work described in this Specification shall be performed by workmen skilled in the service, maintenance and repair of Fire Fighting System of all types and shall be executed in accordance with the best commercial practice.

All materials to be supplied in connection with work under this Specification shall be new and unused ,and shall generally be of the best quality as regard manufacture and performance.

2.3 SUPERVISION

The Sub-contractor shall have a Foreman in charge of the service, maintenance and repair work to be carried out under this Specification. This foreman must be thoroughly competent in supervising the service, maintenance and repair of the Fire Fighting System of all type and shall be in the direct employment of the Sub-contractor, and acceptable to the Superintending officer.

The Sub-contractor shall have in his direct employ, workmen who are especially skilled in the service, maintenance and repair Fire Fighting System of all types.

2.4 SCOPE OF WORK

All machinery equipment comprising the complete Fire Fighting System and Ancillary Equipment shall be serviced and maintenance.

The services and maintenance of the complete Fire Fighting System and Ancillary Equipment shall be strictly in accordance with the **Servicing and Maintenance Schedule** as set out in clause 5 below.

The Sub-contractor shall advise the Superintending Officer of any defect in any part or parts of the complete Fire Fighting System and Ancillary Equipment observed during routine inspection and service, and shall repair such defects if required to do so by the Superintending Officer.

The Sub-contractor shall also provide emergency repair service during normal working hours and also during overtime hours if required to do so by the Superintending Officer.

2.5 SERVICING AND MAINTENANCE SCHEDULES

The Sub-contractor shall inspect and service the machinery and equipment comprising the complete Fire Fighting System and Ancillary Equipment at the above premises periodically as scheduled in the check list except where otherwise directed by the Superintending Officer.

The check list is in no way exhaustive and shall not in any way relieve the Sub-contractor from executing any other work necessary to ensure the efficient functioning of the Fire Fighting System and ancillary Equipment. The Sub-contractor shall submit detail service and maintenance Schedule for approval by the S.O upon completion of work.

The contract shall report in writing to the Superintending Office any defect/s observed in any part or part of the complete Fire fighting System and Ancillary Equipment. The report shall state the cause/s of the defect/s observed, shall include an estimate of the cost of repairs required.

Inspection of diesel engine and all related system, and

- a) Check engine lubricating oil level, top up and replace if necessary,
- b) Check engine and fuel pipe lines for leaks and rectify as necessary,
- c) Check air cleaner element, clean or replace if necessary.
- d) Check engine starter motors and automatic starting system.
- e) Check engine fuel injection system and rectify if necessary.
- f) Check diesel engine fuel tank, top up and replace if necessary,
- g) Check engine cooling system and fan belt tension, replace and rectify if necessary,
- h) Check engine instrumentation,

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- i) Check battery condition and charging unit for defect and rectify if necessary.

Inspection all water pump, and

- a) Check all seals, gland and pipe lines for leaks, and rectify if necessary,
- b) Re-pack and adjust pump gland as necessary,
- c) Check all pump bearings and lubricate with oil or grease as necessary,
- d) Check the alignment and condition of all rubber couplings between pump and driving motors, and as necessary,
- e) Check the tension of belt drives, and adjust as necessary.
- f) Check all bolt and nuts for tightness, and tighten as necessary.

Inspect all Electric Motor, and

- a) Check all motor bearings, and lubricate with oil or grease as necessary,
- b) Check carbon brushes and slip rings of all motors, and clean as necessary. Renew carbon brusher as necessary.
- c) Check safety devices fitted to all motors, and clean, adjust and lubricate as necessary.

Inspect and check the routine operation of all electrical starters, electrical control gears, and ancillary electrical apparatus and,

- a) Clean adjust and lubricate all bearings, pivots, and other moving parts as necessary.
- b) Renew electric fuses as necessary.

Check all water piping and hose reels, etc, for leaks and

- a) Flush out system of all dirt,
- b) Clean and adjust nozzle of hoses,
- c) Reprime the fire Fighting System,

Check Fire Alarm System for defects and rectify as necessary.

Test run diesel pump and electrical pump for automatic starting and switchover operation for minimum running period of half an hour.

Instruction the operators responsible for the operation of the complete Fire Fighting System and ancillary Equipment, and on maintenance points to be watched.

The Sub-contractor shall report in writing to the Superintending officer any defect/s observed in any part or parts of the complete Fire fighting System and Ancillary Equipment. The report shall state the cause/s of the defect(s) observed, and shall include an estimate of the cost of repairs required.

Check List (To be done monthly)

i) Piping

- Inspect all pipes work for corrosion & clean, repaint or replace if necessary.
- Flush all system pipework.

ii) Electrical

- Check operation of circuits breakers & all electrical relays & switch gears.
- Check wiring connection to fire alarm console & panels.
- Check and clean all electrical contacts.

iii) Fire Alarm System

- Check bulbs are functioning.
- Check buzzers are operating.
- Check flashing lights are operating.
- Check exit lights are operating.

a) Check all detectors.

- Check operation of break glass.
- Check the insulation resistance of the alarm system & the resistance of associated earth continuity circuit.
- Check the operation of at least 20% of the various types of detectors.

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- Check fire brigade connection.
 - Check battery conditions & top up electrolyte if necessary.

Inspect all water pumps, and:-

- a.) Check all seals, glands and pipe lines for leaks and rectify as necessary.
- b) Re-pack and adjust pump glands as necessary.
- c) Check all pumps bearings and lubricate with oil or grease as necessary.
- d) Check all alignment and condition of all rubber couplings between pumps and driving motors, and rectify as necessary.
- e) Check the tension o all belt drives, and adjust as necessary.
- f) Check all bolts and nuts for tightness, and tighten as necessary.

Inspect all electrical motors, and :-

- a) Check all motor bearings, and bearings, pivots and other moving parts as necessary.
- b) Clean or renew electric contactors as necessary.
- c) Renew electric fuses as necessary.
- d) Inspect and check the routine operation of all electrical starters, electrical control gears, and ancillary electrical apparatus and :-
- e) Clean, adjust and lubricate all bearings, pivots and other moving parts as necessary.
- f) Renew electric fuses as necessary.

Check all water piping and for leaks and repair leaks, (if any)

Instruct the operators responsible for the complete Booster Pump System and Ancillary Equipment, and on the maintenance points to be watched.

Report in writing to the Superintending Officer any defect/s observed in any part or parts of the complete Fire Fighting System and Ancillary Equipment. The report shall state the cause/s of the defect/s observed, and shall include an estimate of the cost of repairs required.

2.6 CONSUMABLE MATERIALS

The Sub-contractor shall supply the following consumable materials as and when required :-

- a) All oils and greases required for lubrication of diesel engine, belting, fan bearings, motor bearings, pivots and other moving parts, pump gland packing.
- All carbon brushes required to replace worn brushes in electric motors.
- All electric contact points required to replace worn electric contact points in switch gears, motor starter gears, electric control gears and electric relays.
- All cotton waste, soap detergent and other cleaning materials required for cleaning purposes.
- All pump and motor lubricant/coolants such as grease and oil.

2.7 REPAIRS

The Sub-contractor shall repairs defects in the complete Fire Fighting Systems and Ancillary Equipment on the instructions of the Superintending Officer. The costs of such repair shall not included in the fixed monthly rate quoted by the Sub-contractor for the Service and Maintenance of the complete Fire Fighting Systems and Ancillary Equipment but shall be charged for separately by the Sub-contractor.

All repairs on the Fire Fighting Systems and Ancillary Equipment shall be guaranteed by the Sub-contractor against defects in workmanship and materials for a period of one year to take effect from date of completion of repairs. During the guarantee period the Sub-contractor shall rectify defects in repairs carried out by him with no additional charge to the Client.

2.8 SERVICE AND MAINTENANCE RECORDS

The Sub-contractor shall provide a service and maintenance record book for the complete Fire Fighting Systems And Ancillary Equipment being serviced and maintained, and brief details of all service, maintenance and repairs carried out on the complete Fire Fighting System and Ancillary Equipment shall be entered by the Sub-contractor into this book for checking purposes. The address and telephone number of the Sub-contractor's service station shall also be entered into this record book to facilitate emergency service calls.

The Sub-contractor shall also keep an accurate detailed record in duplicate of all service, maintenance and repair work carried out by him on the complete Fire Fighting System and Ancillary Equipment. This record shall be in the form of a Maintenance/Repair Sheet, and shall be countersigned by the Superintending Officer each time the Fire Fighting Systems and Ancillary Equipment is attended to by the Sub-contractor.