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Johannesburg

		REFERENCE	REV
TITLE	**STANDARD FOR REPAIRS AND MAINTENANCE OF FIRE EXTINGIUSHING EQUIPMENT**	**CP_TSSTAN_065**	**2**
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FOREWORD

INTRODUCTION

The purpose of this maintenance standard document is to ensure that fire extinguishing equipment are inspected and maintained, to keep them in safe operating condition and are ready for use at all times. It is not the intent of this standard to restrict any jurisdiction from exceeding the minimum requirements described in this document.

1. SCOPE

This standard defines the minimum requirements for establishing a preventative maintenance program for fire extinguishing equipment. These requirements shall apply to City Power fire extinguishing equipment as per SHEQ department requirements. The standard identifies the systems and items to be inspected, frequency of inspection and maintenance, and testing. This standard is not intended to supersede any instructions, specifications, or practices defined or required by the fire apparatus manufacturer, component manufacturer, equipment manufacturer or the authority having jurisdiction.

2. NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this standard. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 1475-1:2010: *The production of reconditioned fire-fighting equipment* ***Part 1****: Portable and wheeled (mobile) rechargeable fire extinguishers*

SANS 1475-2:2010: *The production of reconditioned fire-fighting equipment* ***Part 2****: Fire hose reels and above ground hydrants*

SANS 1522:2004: *Fire extinguishing powders*

SANS 1910:2009: *Portable refillable fire extinguishers*

SANS 1567:2014: *Portable rechargeable fire extinguishers — CO2 type extinguishers*

SANS 6406:2006: *Gas cylinders — Seamless steel gas cylinders — Periodic inspection and testing*

SANS 543:2019: *Fire hose reels (with semi-rigid hose)*

SANS 6172:2014: *Fire extinguishers — Assessment of fire rating*
SANS 10400: *Code of practice for application of the national building regulations.*

3. DEFINATIONS

3.1 Inspection: General monitoring of equipment.

3.2 Maintenance: The act of servicing fire apparatus or a component within the time frame prescribed by the authority having jurisdiction, based on manufacturer's recommendations, local experience and operating conditions in order to keep the components in proper operating condition.

3.3 Preventative maintenance: The act or work of keeping something in proper condition by performing necessary preventative actions, in a routine manner, to prevent failure or breakdown.

3.4 Manufacturer recommendations (Specification): Any requirement or suggestion a fire apparatus builder or component producer makes in regard to care and maintenance of its product.

3.5 Modification: An alteration or adjustment to any component that is a deviation from the original specification or design of the fire apparatus.

3.6 Overhaul: To inspect, identify deficiencies and make necessary repairs to return a component to operational condition.

3.7 Qualified Person: A person who, by possession of a recognised professional certificate or skill and who by knowledge, training and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work or project.

3.8 Repair: To restore to sound condition after failure or damage.

3.9 Replace: To remove an unserviceable item and install a serviceable counterpart in its place.

3.10 Test: To verify serviceability by measuring the mechanical, pneumatic, hydraulic or electrical characteristics of an item and comparing those characteristics with prescribed standards.

3.11 Operational test: A test to determine the operational readiness of a component on a fire apparatus by observing the actual operation of the component.

4. GENERAL REQUIREMENTS FOR CYLINDERS

All inspection shall be conducted in accordance with the manufacturer's recommended procedures. Inspections shall be performed at least as frequently as the manufacturer's recommended intervals and when the fire apparatus or any component is suspected or reported to have defects or deficiencies. All defects of deficiencies found during an inspection shall be repaired or corrected by a qualified person.

5. LIST OF PROCEDURES FOR PERIODIC INSPECTIONS AND TESTS

Each cylinder shall be submitted to periodic inspections and tests. The following procedures, where applicable, form the requirements for such inspections and tests and are explained more fully according to relevant standards and clauses:

a) Identification of cylinder and preparation for inspection and tests.
b) Depressurization and de-valving.
c) External visual inspection.
d) Check of internal condition.
e) Supplementary tests.
f) Inspection of cylinder neck.
g) Pressure test or ultrasonic examination.
h) Inspection of valve and other accessories.
i) Replacement of cylinder parts.
j) Cylinder repairs.
k) Final operations.
l) Rejection and rendering cylinder unserviceable.

Cylinders that fail an inspection or test shall be rejected. Where a cylinder passes the above listed procedures but the condition of the cylinder remains in doubt, additional tests shall be performed to confirm its suitability for continued service, or the cylinder shall be rendered unserviceable.

6. IDENTIFICATION OF CYLINDER

Before any work is carried out, the relevant cylinder data and its contents and location shall be identified. Cylinders with incorrect or illegible markings or unknown gas contents shall be set aside for special handling.

7. FACILITIES

The reconditioning of extinguishers shall be done in an acceptably managed and equipped permanent workshop, supported, when relevant, by a mobile workshop or service vehicle.

8. LIFE SPAN OF MEDIUMS

Unless otherwise specified by the manufacturer, the maximum life span of extinguishing mediums shall be as given in table 1.

Extinguishing medium	Maximum life span (Years)
Powder	10
Water	5
Foam	5
Halon	10
Carbon dioxide	10

Table 1 — Life span of mediums

9. CAPACITY

An extinguisher shall have a capacity in the range 1,0 kg to 5,0 kg (in increments of 0,5 kg) or in the range 5 kg to 12 kg (in increments of 1,0 kg). The mass of the charge shall be equal to that marked on the extinguisher, subject to the tolerance given in table 1 of SANS 1910.

9.1 Mass

The total mass of a fully equipped (including accessories), fully charged extinguisher (excluding the mounting bracket) shall be equal to that marked on the extinguisher, subject to a tolerance of ± 5,0 %, but not in excess of 23 kg.

10. EXTERNAL VISUAL INSPECTION

10.1 Preparation for external visual inspection

When necessary, the cylinder shall be cleaned and have all loose coatings, corrosion products, tar, oil or other foreign matter removed from its external surface by a suitable method, e.g. by brushing, shot-blasting (under closely controlled conditions), water jet abrasive cleaning, chemical cleaning or other suitable methods. The method used to clean the cylinder shall be a validated, controlled process. Care shall be taken at all times to avoid damaging the cylinder or removing excess amounts of cylinder wall.

If fused nylon, polyethylene or a similar coating has been applied and the coating is seen to be damaged or it prevents proper inspection, then the coating shall be stripped. If the coating has been removed by the application of heat, in no case shall the temperature of the cylinder have exceeded 300 °C.

10.2 Re-usable powder

If, during maintenance, powder is removed for the effective inspection and control of a cylinder, the powder may be re-used, subject to the following:

a) The powder shall be sieved and if it is determined, during sieving, that the powder is free from lumps and foreign material, the powder may be re-used: or
b) If not (see (a) above), it shall be discarded.

Note: Different grades and types of powders shall not be mixed.

10.3 Gas supply (expellant)

All workshops involved with the charging of stored-pressure extinguishers shall be furnished with a suitable supply of inert gas and a pressure control system incorporating:

a) Pressure regulator,

b) Safety relief valve with a pressure of 1,5 times the working pressure, and

c) A working pressure gauge, for the pressurizing (charging) of stored-pressure cylinders.

NOTE: The standard(s) relevant to the type of extinguisher being reconditioned should be consulted.

11. Charging of extinguishers

11.1 Filling area of permanent workshops

The extinguisher filling area shall be so designed and constructed as to render it free from contamination from other areas and by other services.

11.2 Dry-powder extinguishers

When any dry-powder extinguisher is opened for inspection and servicing, ensure that the following precautions are observed:

a) in order to minimize the effect of atmospheric moisture on the powder, open the extinguisher in a clean, dry workplace only and for the minimum time necessary for examination; and

b) ensure that the powder that is removed from the extinguisher and which has to be saved during servicing, is stored in properly cleaned, dry storage receptacles.

11.3 Carbon dioxide (CO2) extinguishers

CO2 extinguishers shall be charged with CO2 that complies with the requirements given for CO2 in SANS 1567.

WARNING: These extinguishers are charged to a very high pressure. They may be opened for inspection only after having been fully discharged.

11.4 Foam extinguishers

Foam extinguishers shall be charged only with the type of foam marked on the extinguisher label. If there is no indication of the type of foam on the label, or if the label is missing or illegible, replace the extinguisher with one suitable for the risk.

WARNING: It is important that foam extinguishers are refilled. not only with the correct type foam. but also with foam of the correct concentration.

11.5 Halon extinguishers

These extinguishers shall be reconditioned in accordance with the manufacturer's specification and, unless exempted from pressure testing by the Department of Labour, these extinguishers shall be replaced with an acceptable type of extinguisher.

WARNING: As these extinguishers are pressurized, they can be opened for inspection only after having been safely depressurized. Compliance with the Montreal Protocol1) prohibits the discharge of halons into the free atmosphere. It is therefore recommended that the charge be collected and stored for alternative safe use, if possible. The Montreal Protocol also requires these extinguishers to be phased out.

11.6 Extinguisher conversion

An extinguisher of one medium shall not be converted to an extinguisher of another medium.

11.7 Repair or modification

Repair or modification to the cylinder shall not be permitted.

11.8 Re-coating of aluminium cylinders

Re-coating of aluminium cylinders shall only be carried out in terms of the manufacturer's specification.

WARNING: Due to the effect of heat on aluminium, compliance to the above requirement shall be maintained at all times.

11.9 Soda-acid extinguishers

Extinguishers of this type shall be replaced with an acceptable type of extinguisher.

12. Rejection of the cylinder

Condemn any extinguisher cylinder that

a) Has been repaired by means of soldering, brazing, welding or the use of patching components,

b) Has damaged screw threads,

c) Exhibits excessive corrosion, damage, or mechanical markings on the body other than authorized markings applied in terms of the applicable manufacturer's specification,

d) Has been burnt in a fire,

e) Is of stainless steel and has been in use with a calcium chloride type of extinguishing medium (water and powder with a high chloride content are not compatible with certain types of stainless steel),

f) Is constructed of copper or brass joined by soft solder or by riveting or that is manufactured from a non-metallic material (The reliability and safety of such extinguishers cannot be determined by standard pressure testing.), or

g) is unable to be maintained in compliance with the requirements of the original manufacturer.

13. Extinguisher test pressure

The test pressure applied to an extinguisher shall be as indicated on the cylinder. Except CO2 extinguishers, all other extinguishers shall be tested to a minimum test pressure of 2 000 kPa or 1,5 times the working pressure, whichever is the greater, and maintained for at least 60 s.

14. FIRE HOSE REELS AND ABOVE-GROUND HYDRANTS

This part of standard details the procedures that apply to the effective maintenance and repairs of fire hose reels and above-ground fire hydrants. It does not cover the replacement or installation of hose reels and above-ground hydrants.

14.1 Requirements for maintenance and repairs

Maintenance and repairs of a fire hose reel or an above-ground hydrant shall ensure that the fire hose reel or above-ground hydrant is restored to full and effective operational readiness and complies with the requirements of the original manufacturer.

NOTE Reconditioning of fire hose reels excludes reconditioning of the inlet stop valves as described in SANS 543.

14.2 Frequency of maintenance

Maintenance of fire hose reels and above-ground hydrants shall be carried out annually in accordance with the relevant procedures given in the standard.

14.3 Modification

Modification to the fire hose reel or hydrant shall not be permitted.

15. Maintenance

15.1 Fire hose reels

Fire hose reels shall be maintained in accordance with the details given in annexure of this standard together with the relevant steps of the procedures given.

15.1.1 Mounting and operation of fire hose reel
Mounting bolts shall be checked to ensure that they hold the hose reel securely in position to allow for the designed use of equipment.

15.1.2 Component parts
Components of the hose reel shall be checked to ensure that they are functioning as prescribed by the manufacturer.

15.1.3 Water control fittings
Water control fittings (i.e. inlet stop valve and shut-off nozzle) of the hose reel shall be checked to ensure that they are functioning as prescribed by the manufacturer. The inlet stop valve shall be opened during the maintenance procedure in order to ensure that it is operative. The inlet stop valve might develop a leak (bypass) after having been opened as required above. The repair of any such leaks shall be the responsibility of the responsible person, as the inlet stop valve does not form a part of the maintenance requirement.

15.1.4 Fire hose
The fire hose shall be checked to ensure that:

a) it is not more than 30 m nor less than 28 m in length, and
b) it is free from joints.

With the inlet stop valve open and the hose reel shut-off nozzle closed, the fire hose shall be examined for signs of damage or leakage.

15.1.5 Water seals
With the inlet stop valve open and the hose reel shut-off nozzle closed, all water seals (i.e. O-rings and gland packing) shall be examined for signs of damage or leakage. After closing the inlet stop valve, the gland nut and valve washer shall be examined for signs of damage or leakage.

15.1.6 Service labels
On completion of the service maintenance procedures, service labels shall be completed and fitted in accordance to SANS1475-2.

15.1.7 Sealing
Using an acceptable safety seal, the inlet stop valve shall be sealed in a manner that prevents use without breaking the seal.

15.1.8 Water supply
Fire hose reels with no water at the time of maintenance shall not be serviced and shall be indelibly marked **"NO WATER"**, recorded and reported to the responsible person. Service labels shall also be removed.

NOTE: Checking water supply and pressure should be the obligation of the responsible person (see SANS 10400).

15.2 Above-ground hydrants

Above-ground hydrants shall be maintained in accordance with the details given in annexure, at the frequency given, together with the relevant steps of the procedures given in this standard.

15.2.1 Component parts
Components of the above-ground hydrants shall be checked to ensure that they are functioning as prescribed by the manufacturer.

15.2.2 Water control fittings

The water control fitting (i.e. spindle assembly and clack washer) of the above-ground hydrant shall be checked to ensure that it is functioning as prescribed by the manufacturer. The above-ground hydrant shall be opened during the maintenance procedure in order to ensure that it is operative. The above-ground hydrant might develop a leak (bypass) after having been opened as required above. The repair of such leaks shall be the responsibility of the responsible person.

15.2.3 Water seals

With the above-ground hydrant open and a blank cap assembly fitted, the lip seal washer shall be examined for signs of damage or leakage. After closing the above-ground hydrant, the spindle gland and clack washer shall be examined for signs of damage or leakage.

15.2.4 Service labels

On completion of the service maintenance procedures, service labels shall be completed in and fitted in accordance to SANS 1475-2.

15.2.5 Sealing

Using an acceptable safety seal, the above-ground hydrant shall be sealed in a manner that prevents use without breaking the seal.

15.2.6 Water supply

Above-ground hydrants with no water at the time of maintenance shall not be serviced and shall be indelibly marked **"NO WATER"**, recorded and reported to the responsible person. Service labels shall also be removed.

NOTE Checking water supply and pressure should be the obligation of the responsible person (see SANS 10400).

15.3 Substation pumping systems

Any fire pump, auxiliary pump, or transfer pump and its associated systems on a fire apparatus shall be inspected and maintained. All fire pumps, auxiliary pumps and transfer pumps shall be inspected for security of mounting, structural integrity and leakage and shall be operational tested. All pump shafts seals shall be inspected and maintained in accordance with the manufacturer's recommendations. Renewable anodes, intake strainers or any other means to prevent electrolysis shall be inspected for condition. All pump piping, valves and valve controls, fire hose connections, caps, chains, and gaskets shall be inspected for security of mounting, structural integrity, deformation and leakage and shall be lubricated. All instrumentation and gauges shall be tested for accuracy.

15.4 Warning system, Instruction plates and Signage

All visual and audible warning systems shall be operationally tested. All instruction plates and hazards and warning signage shall be inspected. All components of the electrical systems, including but not limited to the following systems, shall be inspected for security of mounting, deformation, and wear and shall be operationally tested:

a) Lighting system
b) Intercom system
c) Auxiliary power systems
d) Line voltage system
e) Interlock system
f) Collector rings

15.5 Waterway system

All components of the waterway system, including but not limited to the following components, shall be inspected for structural integrity, security of mounting, deformation, leaks, wear and alignment, shall be operationally tested, shall be maintained as recommended by the manufacturer and where required shall be lubricated:

a) Attaching brackets
b) Flow meter
c) Gauges
d) Valves
e) Pressure control devices
f) Seals, rings, packing and gaskets
g) Monitor and remote controls

15.6 Line voltage electrical systems (110Vdc/230Vac)

Any line voltage (110Vdc/230Vac) electrical system on a fire apparatus shall be inspected and maintained in accordance to this clause.

15.6.1 Line voltage generation units

All components of the line voltage generation unit shall be maintained in accordance with the recommendations of the manufacturer. All line voltage generation units shall be inspected for security of mounting, condition, fluid leakage and proper operation. Inverter shall be inspected for security of mounting and condition and shall be operationally tested. Remote controls for electric power generation units shall be inspected and shall be operationally tested.

15.6.2 Wiring

All wiring and wire looms shall be inspected for security of mounting, proper routing, grommets in place, condition and cleanliness.

15.6.3 Circuit protection

Circuit breakers and ground fault circuit interrupter shall be inspected for condition and operationally tested.

15.6.4 Instrumentation

Instrumentation, including voltmeter(s), ammeter(s), and frequency meter(s); warning and indicator lights; and associated interlock systems shall be inspected for condition and operationally tested.

15.7 Foam proportioning system

All components of the foam proportioning system shall be maintained in accordance with the recommendations of the manufacturer. All components of the foam proportioning system shall be inspected for security of mounting, structural integrity and leakage and shall be operationally tested.

15.7.1 Cleaning

The foam proportioning system shall be thoroughly flushed, cleaned and inspected after each use to ensure that all foam concentrate is clear of all piping and components. Special attention shall be paid to check valves and ball valves during any flushing and cleaning process, as they can be susceptible to the corrosive effects of some foam concentrates.

Exception: *Components that are designed to stay in continuous contact with foam concentrate shall not need to be flushed or cleaned.*

15.7.2 Strainer or filter

Where foam concentrate strainer(s) or filter(s) are utilised, the strainer/filter assembly shall be serviced at routine scheduled intervals.

15.7.3 Foam concentrate pump

Where the foam proportioning system is equipped with a foam concentrate pump, it shall be maintained as recommended by the manufacturer.

The oil for the pump lubrication system shall be maintained at the level recommended by the manufacturer.

15.7.4 Testing

If there is a need to test the accuracy of the foam proportioning system, the procedures outlined by the manufacturer shall be followed.

16. Pressure test area

Owing to the dangers involved, pressure testing shall be treated with particular caution. The pressure test area shall be so constructed or arranged that the safety of all personnel is ensured.

16.1 Fire pumps

If the fire apparatus are equipped with a fire pump, the pump shall be serviced in accordance to the relevant standard, at least annually and whenever major repairs or modifications to the pump or to any component of the apparatus that is used in pump operations have been made. The visual inspection, operational tests and load testes defined in the standard shall be conducted at the following times:

a) At least annually
b)After major repairs or overhaul
c)Following the use of the apparatus
d)When usage has exceeded the manufacturer's recommendations.

17. Maintenance scope

Designation	Systems	Equipment	Cost Per Item	labour
Office space	Fire detector	Electrical circuits		
		Equipment System		
	Fire extinguisher	Valves		
		Seals		
		Cylinder		
		Chambers		
		Pressure indicators		
		Fluids		
Inside/Outside building	Fire reel	Valves		
		Seals		
		Pressure indicators		
		Fluids		
	Fire extinguisher	Valves		
		Seals		
		Cylinder		
		Chambers		
		Pressure indicators		
		Fluids		
	Fire hydrant	Valves		
		Seals		
		Cylinders		
		Chambers		
		Pressure indicators		
		Fluids		
Substation	Fire pump system	Tanks		
		Pumps		
		Valves		
		Seals		
		Cylinder		
		Chambers		
		Pressure indicators		
		Fluids		
		Aerial devices		
		Nozzles		

Table 2: Generic maintenance scope

18. DOCUMENTATION

Technical product catalogue and operating & installation manuals shall be provided.

18.1 Records

In addition to providing the required labels, a soft and hard copies shall be provided to City Power with a record/information that contains the following information, as relevant:

a) Name of the customer (City Power).
b) Date and type of service.
c) Date of recharging.
d) Date of pressure testing.
e) Next service due date.
f) Size and type of extinguisher.
g) Location of the extinguisher.

The information shall be kept by the City Power (Responsible Person) for at least 3 years, and when necessary, shall be made available to the maintenance and repair company for purposes of inspection and updating.

19. TRAINING OF STAFF

19.1 The following approved training courses, for City Power's staff, shall be provided:
19.1.1Operating, and
19.1.2 Maintenance.
19.2 The associated costs for an approved training course in 19.1 shall be given per person

All staff members involved in the Health and Safety shall have been trained and, where relevant, registered to ensure that each section of the work is carried out in accordance with the relevant standard.

They shall have been made fully aware of safe working practices and any dangers involved in the use of an extinguisher.

20. MARKING

20.1 Service labels

When all the relevant inspection and service procedures have been completed, record legibly and indelibly and on an acceptable, waterproof, adhesive label that is firmly fixed to the extinguisher, the following information:

a) Name, physical address and contact number of the servicing company.
b) Registration number of the registered competent person.
c) Date of service.
d) Next service due date.
e) Actual mass.

20.2 Pressure test labels

Record legibly and indelibly on a separate, acceptable, waterproof, adhesive label that is firmly fixed to the extinguisher, the following information:

a) Name and contact number of the reconditioning organization.
b) Registration number of the registered competent person.
c) Date of pressure test.
d) Test pressure in kilopascals (Water pressure at time of service).

NOTE: The pressure recorded on the service label reflects the pressure at the time that maintenance was conducted and might be subject to fluctuations or interruptions in water supply.

20.3 Positioning of service labels

20.3.1 Fire hose reels

Fire hose reels shall have two service labels applied in the following positions:

a) One service label on the outside of the front hose reel disc; and

b) One service label in a position that is visible once the fire hose reel is fully unwound.

20.3.2 Above-ground hydrants

Above-ground hydrants shall have one service label applied in one of the following positions:

a) On the supply pipe to which the above-ground hydrant is mounted and as near as possible to the above-ground hydrant, or

b) On the wall or structure to which the above-ground hydrant is mounted and as near as possible to the above-ground hydrant valve.

21. RECOMMENDED CHECK LIST

Item	Item check	Corrective action
1	**Cylinder**	
	•Hydrostatic pressure test date, or date of manufacture	•Retest if necessary
	•Corrosion	•Hydrostatic pressure test and refinish or discard
	•Mechanical damage (denting or abrasion)	•Hydrostatic pressure test and refinish or discard
	•Paint condition	•Refinish
	•Presence of repairs (welding, soldering, brazing, etc.)	•Condemn
	•Damaged threads (corroded, cross-threaded or worn)	•Condemn
	•Broken hanger attachment or broken carrying handle lug	•Condemn; or consult manufacturer
	•Sealing surface damage (nicks or corrosion)	•Clean, repair and test for leakage; or discard
2	**Instruction label**	
	•Illegible wording	•Clean; or replace
3	**Nozzle or horn**	
	•Deformed, damaged or cracked	•Replace
	•Blocked openings	•Clean
	•Damaged threads (corroded, cross-threaded or worn)	•Replace
	•Aged (brittle)	•Replace
4	**Hose assembly**	
	•Damaged (cut, cracked or worn)	•Replace
	•Damaged couplings or swivel joint (cracked or corroded)	•Replace
	•Damaged threads (corroded, cross-threaded or worn)	•Replace
	•Inner tube out at couplings	•Repair or replace
	•If not electrically non-conductive between couplings (CO_2 hose only)	•Replace
5	**Safety device**	

	•Damaged (bent, corroded or binding) •Missing	•Repair and lubricate; or replace •Replace
6	**Pressure indicating device**	
	•Immovable, jammed or missing pointer •Missing, deformed or broken lens •Illegible or faded dial •Corrosion •Dented case or lens retainer •Immovable or corroded pressure-indicating stem (non-gauge type)	•Depressurize, and replace gauge •Depressurize, and replace gauge •Depressurize, and replace gauge •Depressurize and check calibration •Depressurize and check calibration; or replace gauge •Replace head assembly, depressurize and replace cylinder or entire extinguisher
7	**Cylinder valve assembly**	
	•Corroded, damaged or jammed lever, handle, spring, stem, or fastener joint •Damaged outlet threads (corroded, cross threaded or worn)	•Check freedom of movement, and repair; or replace •Replace
8	**Nozzle shut-off valve**	
	•Corroded, damaged, jammed or binding lever, spring, stem, or fastener joint •Plugged, deformed or corroded nozzle	•Repair and lubricate; or replace •Clean; or replace
9	**Actuating mechanism**	
	•Damaged, jammed or binding lever, stem, or fastener joint •Dull or damaged cutting or puncture pin •Damaged threads (corroded, cross-threaded or worn)	•Replace •Replace •Replace
10	**Gas cartridge (external type only)** a	
	•Corrosion 10-B Damaged seal disc (injured, cut or corroded) Replace •Damaged threads (corroded, cross-threaded or worn) •Illegible or incorrect mass markings Replace	•Replace (destroy old cartridge in a safe manner) •Replace •Replace
11	**Gas cylinders**	
	•Hydrostatic pressure test date, or date of manufacture •Corrosion •Paint condition •Presence of repairs (welding, soldering, brazing, etc.) •Damaged threads (corroded, cross-threaded or worn)	•Retest if needed •Hydrostatic pressure test and refinish, or discard •Refinish •Condemn; or consult manufacturer •Condemn; or consult manufacturer
12	**Operating head assembly**	

	•Corroded, cracked or broken •Damaged threads (corroded, cross-threaded or worn) •Sealing surface damage (nicked, deformed or corroded) •Blocked vent hole or slot	•Replace •Replace •Clean, repair and test for leakage; or replace •Clean
13	**Carrying handle**	
	•Broken handle lug •Broken handle •Corroded, jammed or worn fastener joint	•Discard shell or valve; or consult manufacturer •Replace; or consult manufacturer •Clean and replace
14	**Safety seals or tamper indicator**	
	•Broken or missing	•Replace
15	**Pressurizing valve**	
	•Leaking seals	•Depressurize, and replace valve or core
16	**Gasket, O-ring and seals**	
	•Damaged (cut, cracked or worn) •Missing •Aged or weathered (compression set, brittle, cracked)	•Replace and lubricate •Replace and lubricate •Replace and lubricate
17	**Brackets**	
	•Corroded, worn or bent •Loose and binding •Worn, loose, corroded or missing screw or bolt •Worn bumper, webbing or grommet	•Repair and refinish; or replace •Adjust; or replace •Tighten or replace •Replace
18	**Siphon tube**	
	•Corroded, dented, cracked or broken •Blocked tube or blocked tube openings	•Replace •Clean; or replace
19	**Safety relief device**	
	•Corroded or damaged manufacturer •Broken, operated or plugged	•Depressurize and replace or consult •Depressurize and replace; or repair
Self- expelling type		
1	**Carbon dioxide type**	
	•Incorrect mass •Broken or missing safety seal	•Recharge to proper mass •Test for leakage, determine mass, recharge, and replace safety seal
Gas cartridge or gas cylinder types		
2	**Dry chemical powder types**	

	•Incorrect mass or charge level •Agent condition (contamination, caking or wrong agent) **Gas cartridge (external type only)** a) punctured seal disc b) incorrect mass c) broken or missing safety seal **Gas cylinder with gauge** a) low pressure b) broken or missing safety seal **Gas cylinder without gauge** a) low pressure (attach gauge and measure pressure) b) broken or missing safety seal	•Empty and recharge to correct mass •Empty and recharge •Replace cartridge •Replace cartridge •Examine seal disc, replace safety seal •Replace cylinder •Test for leakage, replace safety seal •Test for leakage, replace safety seal, if low, replace cylinder •Measure pressure, test for leakage, replace safety seal
Stored-pressure types		
3	**Dry chemical powder, refillable**	
	•Incorrect extinguisher mass •Incorrect gauge pressure •Broken or missing safety seal •Agent condition	•Empty and recharge to correct mass with correct powder •Check gauge, depressurize, test for leakage •Replace safety seal, test for leakage •Replace with correct agent
4	**Halon type**	
	•Broken or missing safety seal •Incorrect gauge pressure •Incorrect mass	•Weigh, test for leakage, replace safety seal •Check gauge, depressurized, test for leakage •Test for leakage, recharge to correct mass
Self-expelling types		
5	**Foam type**	
	•Incorrect fill level (by mass or observation) •Agent condition (presence of sediment or other foreign matter) •Incorrect gauge pressure •Broken or missing safety seal	•Empty and recharge •Empty and recharge •Check gauge, repressurize, test for leakage •Replace safety seal, test for leakage
Checklist for fire hose reels		
1	**Mounting bolts**	
	•Loose and binding •Worn, loose, corroded or missing screw or bolt	•Adjust or replace •Tighten or replace
2	**Frame**	
	•Corrosion •Physical damage •Paint condition	•Repair and refinish, or replace •Repair and refinish, or replace •Refinish

3	**Drum and discs**	
	•Damaged (bent, jammed, corroded or binding) •Worn, loose, corroded or missing screw or bolt •Paint condition	•Repair or replace •Tighten or replace •Refinish
4	**Component parts**	
	•Corrosion •Damaged (bent, broken, cracked or worn) •Damaged threads (corroded, cross-threaded or worn)	•Repair and refinish or replace •Repair or replace •Replace
5	**Inlet control valve**	
	•Missing handle or handwheel •Damaged (bent, jammed or binding) •Leaking (bypassing) washer •Leaking gland	•Replace •Refer to responsible person for repair or replacement •Refer to responsible person for repair or replacement •Adjust by tightening gland nut or refer to responsible person for replacement
6	**Water seals (O-rings and gland packing)**	
	•Missing •Damaged (cut, cracked or worn) •Aged or weathered (compression set, brittle or cracked)	•Replace and lubricate •Replace and lubricate •Replace and lubricate
7	**Fire hose**	
	•Incorrect length (i.e. less than 28 m) •Damaged (cut, cracked, leaking, worn or joints)	•Replace •Cut off damaged section of hose if remaining section will still be 28 m or longer, otherwise replace
8	**Hose guide**	
	•Damaged (bent, jammed or binding)	•Repair and lubricate or replace
9	**Shut-off nozzle**	
	•Damaged (bent, jammed or binding) •Blocked, deformed or corroded nozzle tip or discharge passage	•Repair and lubricate or replace •Clear blockage or replace
10	**Hose clamps**	
	•Worn, loose or corroded	•Replace
11	**Instruction label**	
	•Illegible wording	•Clean or replace
12	**•Safety seal**	
	•Broken or missing	•Replace
Checklist for above-ground hydrants		
1	**Valve body**	

	•Physical damage •Outlet (damaged or deformed) •Paint condition bad	•Repair and refinish or refer to responsible person for replacement •Refer to responsible person for replacement •Refinish
2	**Component parts**	
	•Corrosion •Physical damage Damaged threads (corroded, cross-threaded or worn) •Paint condition bad	•Repair and refinish or replace •Repair or replace •Replace •Refinish
3	**Handwheel or handle**	
	•Missing •Loose •Damaged (bent, jammed or binding)	•Replace •Tighten retaining nut •Repair and refinish or replace
4	**Pawl assembly**	
	•Damaged (bent, jammed or binding)	•Repair and lubricate or replace
5	**Lip seal washer**	
	•Missing •Damaged (cut, cracked or worn) •Aged or weathered (compression set, brittle or cracked)	•Replace •Replace •Replace
6	**Spindle assembly**	
	•Damaged (bent, jammed or binding) •Leaking gland •Leaking clack washer	•Refer to responsible person for replacement •Adjust by tightening gland nut or refer to •Refer to responsible person for replacement
7	**Safety seal**	
	•Broken or missing	•Replace

Table 3 — Item check and corrective action

22. QUALITY MANAGEMENT

A quality management system/plan shall be set up to assure quality during manufacture, installation, removal, transportation, and disposal. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001:2015. The details shall be subject to an agreement between the purchaser and the supplier.

23. ENVIRONMENTAL MANAGEMENT

An environmental management system/plan shall be set up to ensure the proper environmental management and compliance is adhered to during manufacturing, installation, removal, transportation, and disposal. Guidance on the requirements for an environmental management system shall be found in ISO 14001:2015 standards. The details shall be subject to an agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy.

24. HEALTH AND SAFETY MANAGEMENT

A health and safety system/plan shall be set up to ensure proper management and compliance during manufacture, installation, removal, transportation, and disposal. Guidance on the requirements of a health and safety plan shall be found in ISO 45001:2018 standards. The details shall be subject to an agreement between City Power and the Supplier.

ANNEXURE A - BIBLIOGRAPHY

None

ANNEXURE B - REVISION INFORMATION

DATE	REV. NO.	NOTES
October 2014	0	First issue
May 2017	1	General editing
October 2024	2	SANS has been updated
		General editing
		Cost per item and labour has been added on maintenance scope