DEPARTMENT OF PUBLIC WORKS

FIRE SECURITY

STANDARD TECHNICAL SPECIFICATION

FOR THE SUPPLY OF A TANK AND TRAILER

FIRE FIGHTING UNIT WITH PETROL DRIVEN CENTRIFUGAL PUMP

AND SUNDRY ACCESSORIES

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ANNEXURE A: Schedule of Particulars and Information From Tenderers

SKETCH: Of an Existing Tank and Trailer Fire Fighting Unit

STANDARD TECHNICAL SPECIFICATION FOR THE SUPPLY OF A TANK AND TRAILER FIRE FIGHTING UNIT WITH PETROL DRIVEN CENTRIFUGAL PUMP AND SUNDRY ACCESSORIES

1. GENERAL

This specification covers a tank and trailer fire-fighting unit with a petrol driven centrifugal pump and various other fire fighting accessories and equipment. The trailer shall be a four-wheeled pneumatic tyred unit with a complete suspension system.

2. TRAILER

2.1 General Configuration:

The trailer shall comply basically with the attached sketch of an existing unit. The sketch shows a tank extending over the wheels of the trailer, which also acts as mudguards. The shape of the tank is not critical, but should the tank fit between the wheels, mudguards must be provided. The mudguards shall have a chequer pattern or other non-slip surface should it be necessary to stand on top of the mudguards to get at the ladder, manhole or other equipment on top of the tank.

2.2 Construction:

The chassis shall be riveted or welded hot-rolled or tubular steel sections and has adequate cross members.

The trailer shall be of robust construction and designed to operate effectively with a full tank, the pump set and all the auxiliary equipment and tools specified over rough terrain.

In addition, the design shall be such as to facilitate maintenance and repair.

2.3 Mass Distribution:

The mass of the trailer, whether the tank is full or empty, shall be distributed evenly so that no axle carries more than two thirds of the total load under any of these two conditions.

2.4 Dimensions and Clearances:

The dimensions of the trailer unit shall comply with the requirements of the relevant Provincial Traffic Ordinance and also with the following:

2.4.1 The wheelbase shall be as short as is practicable.

2.4.2 The ground clearance shall be not less than 200 mm.

2.4.3 The angle between the road surface at the point of contact of a rear wheel and any part of the trailer extending beyond the rear axle, ie the angle of departure, shall not be less than 25 degrees.

2.5 Axles and Suspension:

The axles shall be capable of supporting the distributed design gross mass of the trailer unit and any braking loads imposed upon them and meet the requirements of SABS 1487; in addition suspension stops shall be fitted to prevent possible damage due to the suspension bottoming. The trailer unit shall be well sprung to take rough terrain, but must not be “jumpy”.

2.6 Brakes:

The trailer shall be fitted with overrun and parking brakes, which shall meet the requirements of SABS 1507. The parking brakes shall be provided with a locking device to prevent the release of the brake when the trailer is stationary. The design of the device shall be such that accidental engagement or disengagement of the brake is not possible.

2.7 Parking Legs:

Retractable parking legs shall be fitted to the trailer. The parking legs shall be sufficiently robust to keep the unit stable while personnel are clambering over the unit and while the pump is operating. The parking legs shall operate by means of a worm gear and the design shall be such that the parking legs will not drop accidentally while in motion.

2.8 Towing Connection:

The drawbar shall be fitted with a caravan or trailer type socket in accordance with Part 3 of SABS 1505 and shall be provided with a robust safety chain complete with hook and safety catch.

2.9 Wheels and Tyres:

The wheels shall be suitable for the load to be carried under off-road conditions. The wheels and tyres shall be of such a size as to ensure that the required clearance is maintained when the tyres are 10% under-inflated. The tyres shall be of 6 ply construction, rated for light commercial use and provided with a tread suitable for off-road use. The nominal width of the tyre shall not be less than 200 mm.

2.10 Jockey Wheel:

The trailer shall be provided with a jockey wheel to facilitate the manoeuvring of the unit by hand. The jockey wheel may be omitted if the supplier can demonstrate satisfactorily to the Department that such a jockey wheel will serve no useful purpose.

2.11 Lights and Electrical Wiring:

The trailer shall be provided with all the rear lights, ie stop lights, indicator lights and night rear lights, to comply with the relevant Provincial Road Traffic Ordinance and be in accordance with SABS 1046. The lights shall be activated from the towing vehicle and the necessary electrical connector, meeting the requirements of SABS 1327, shall be provided. In addition, a red light capable of intermittent flashing, complying with the relevant Provincial Road Traffic Ordinance and directly controllable by the driver of the towing vehicle shall be provided on the highest part of the trailer. A facility shall be provided for connecting the flashing red light to a battery on the trailer when disconnecting from the towing vehicle.
The battery for the flashing red light has been described elsewhere.

Electrical wiring to fixed lights shall run in galvanised conduits secured to the trailer frame. Flexible connections to batteries or detachable lights shall be suitably protected against moisture.

2.12 Chevron Markings:

A panel with chevron markings in accordance with the relevant Provincial Road Ordinance shall be provided at the rear of the trailer if the gross mass of the unit should exceed 3 500 kg or such other limit as may be prescribed by the authorities from time to time.

2.13 Lockers:

The trailer unit shall be provided with lockers to take the hoses, ancillary equipment and tools. The hoses shall be in separate lockers and shall not be stored with any other equipment. The

lockers for the hoses shall be divided into separate compartments for each hose. The lockers for the tools shall also be kept separate from the lockers from the other fire fighting equipment. Provision shall be made for securing all equipment and tools. Readily releasable catches are to be provided.

(Note: The 100 diameter reinforced suction hoses may be secured on top of the tank and no special compartments are required).

2.14 Pump and Engine Mountings:

A mounting for the pump and engine, which are specified elsewhere, shall be located either at the front or the rear of the trailer. The mounting shall be secure and strong to prevent the pump and engine from shifting when the trailer is pulled over rough terrain. It shall be reasonably easy to take the pump and engine off the trailer. This must be possible without the prior removal of any other equipment.

2.15 Brackets for Ladder:

Suitable brackets for the aluminium ladder as specified shall be provided, and the method of securing shall be such as to facilitate easy removal yet be secure during transportation. It shall be possible to remove the ladder without the prior removal of any other equipment. The removal of the ladder must be possible from the ground.

2.16 Damage Prevention:

All vulnerable components, wiring and equipment shall be suitably located and protected to prevent accidental damage during fire-fighting operations or from conditions likely to be encountered when negotiating inhospitable terrain.

3. TANK

3.1 General:

A water tank, that is an integral part of the first-aid fire-fighting system, shall be provided.

3.2 Materials:

The tank shall be made of either stainless steel or mild steel hot-dipped galvanised inside and outside. The galvanising shall be carried out by the hot dip process in accordance with SABS 763 for heavy-duty applications.

3.3 Capacity:

Unless specifically specified otherwise, the tank shall have a capacity of not less than 1 500 litres and not more than 1 750 litres.

3.4 Construction:

The water tank shall be so constructed that it has:

3.4.1 Sufficient baffles of an acceptable design to prevent surging of the tank contents; and to enhance stability when the vehicle is accelerating, cornering or decelerating; the baffles being vented at the top and at the bottom to prevent trapped air and to allow easy flow to the sump; and being permanently affixed inside the tank to form an integral part of the tank structure; and such that they do not prevent inspection of the whole inner surface of the tank.

3.4.2 An outlet connection flanged to the bottom of the tank, compatible with the pump inlet connection, and with which is incorporated an anti-vortex plate located over the connection.

3.4.3 An unobstructed inspection opening of diameter of at least 450 mm with a quick release type cover to provide access for inspection and cleaning, the cover assembly incorporating suitable seals which are impervious to fuel, oil or water and flexible within the temperature range of 0^{o} C to 70^{o} C.

3.4.4 A filling connection.

3.4.5 A combined overflow and vent pipe of diameter at least 80 mm, fitted with a top baffle to prevent spillage by surge located in the neck of the inspection opening, and of such length that the pipe extends behind the rear axle of the trailer and below the chassis.

3.4.6 An approved 90^{o} operation ball type control valve to isolate the tank when the pump and engine unit is to be taken off the tank.

3.4.7 A 50 mm diameter scour pipe extending behind the rear axle of the trailer and below the chassis complete with isolating valve.

3.5 Mounting:

The tank shall be so mounted on the trailer chassis that any torsion occurring in the chassis does not impose stresses and strains on the tank. The centre of mass of a filled tank shall be not more than 700 mm above the top edge of the chassis.

The mounting of the tank on the trailer shall be so designed as to allow for the removal of the tank with minimal disassembly of compartments or panels.

4. PUMP SET

4.1 General:

The usage of the pump and engine unit demands a design of a high standard. The unit must, therefore, be reliable, simple to operate, robust, spares must be readily available and the maintenance must be very low.

4.2 Engine:

The engine shall be a four stroke petrol engine having a continuous power rating to meet the requirements of the pump demand up to 2 500 m above sea level.

The power-output of the engine shall exceed the maximum pump requirements by at least 25% under the worst flow conditions.

Starting shall be by means of a 12 volt starter motor connected to a 12 volt battery with a 250 volt AC mains trickle-charger, all mounted neatly in an approved housing as part of the pump set. By this means the battery will be charged in situ from a standard 15 amp three point domestic plug power point. A 5 m extension cord with both a 15 amp plug and a female plug socket at the charger end, shall be provided as part of the unit.

In addition, the unit shall have a completely independent mechanical means of starting, ie a crank handle or a starting rope. The position of the latter shall be such as to facilitate easy operation even when the unit is mounted on the trailer. The petrol tank on the unit shall be large enough for one hour's operation under full load. The engine shall also be equipped with a reliable hour meter having one-minute calibrations.

The engine shall be provided with an effective silencer.

4.3 Pump:

The pump output requirements shall meet the following delivery / head requirements at a geodetical suction lift of 1,5 m

0	litre / min (delivery valve closed)	920 kPa
200	litre / min	850 kPa
550	litre / min	700 kPa
900	litre / min	460 kPa

The tenderer shall furnish particulars of the pump duty curve of the unit offered operating at 2 500 m above sea level and with a suction lift of 1,5 m in the table provided in Annexure A.

The performance of the pump set under a total suction of 5,0 m (at sea level) shall also be submitted.

It is essential that the pump shall have a very stable head characteristic.

The pump engine connection must be direct or with an approved coupling method. Belt or chain drives are not acceptable. The pump, casing, impeller and shaft must be of corrosion resistant material and wearing parts are to be of the insert type for easy replacement in the pump casing. Full details must be given. The unit must be fitted with pressure and vacuum gauges calibrated in kPa with shut-off valves or cocks on U-tubes.

The suction inlet shall be of adequate size to meet the delivery requirements and with a suction coupling thread in accordance with SABS 1128 Part 2 and with a suitable cone filter on the suction inlet.

The pump shall be provided with pressure release outlets, fitted with two 63,5 mm standard female instantaneous couplings each with cap and 90^0 ball type discharge valve. The pump delivery shall be provided with non-return flap valves. A pump with a single outlet will be accepted provided a suitable manifold with two outlets as described above is supplied. The pump performance curve shall take into account the restrictive effect of the manifold.

Blank caps shall be provided for the inlet and outlet connections complete with securing chains.

A reliable priming system shall be incorporated and be capable of operating effectively against a minimum of 5 m section head without a foot valve and without having to fill the pump with water by any other means.

4.4 Mounting Frame:

The pump engine shall be mounted on a frame provided with carrying handles and two wheels to be able to be pushed like a wheelbarrow and the whole to be attached to the trailer by quick release fittings. When removed from the trailer the pump set must be free standing and operable from any water supply, ie hydrants, open stream, dam etc.

5. HOSE REEL AND HOSE

5.1 Hose Reel:

The hose reel shall be securely mounted on the trailer in such a manner as to allow for easy operation at all times. A manual rewind facility shall be provided and hose guides that will allow extraction to at least 90^o either side of the centre line of the reel. A suitable brake or restraint shall be provided on the hose reel to prevent accidental unwinding.

The reel shall be large enough to accommodate the hose specified hereafter.

The water-seal housing and spindle shall be of an acceptable corrosion resistant material. The diameter of the hub or, if spacing rods are used to form the hub, the circumscribing circle of the rods shall be at least 200 mm. When spacing rods are used, there shall be at least 6 rods of at least 12 mm diameter. The rods shall be firmly secured to the end wheels to ensure rigidity. The end wheels shall run true on the axle and the rims shall be smooth and neatly polished or chromed. Access shall be provided to permit maintenance of the water-seal without dismantling.

The fire hose outlet coupling shall be mounted on the hub in such a position that securing of the hose to the coupling is not obstructed.

5.2 Hose:

The fire hose fitted to the outlet coupling on the reel shall have an internal diameter of 25 mm, a nominal length of 45 m and be red in colour. The hose shall be a braided reinforced light duty hose complying with SABS 988.

The hose shall be resistant to deformation and flattening when coiled. When a length of hose is wound neatly and firmly, but without tension, round a drum of 200 mm diameter, any flattening of the hose shall be such that the maximum external diameter of the coiled hose does not exceed 110% of the actual mean external diameter of the uncoiled hose.

5.3 Nozzle-Cock:

A nozzle-cock shall be fitted to the discharge end of the hose. The nozzle-cock shall be of a non-ferrous metal; shall be capable of providing an adjustable spray and of complete shutting off.

5.4 Hose Runout Guide and Nozzle Bracket:

The hose runout guide and nozzle bracket shall be of a chromium-plated steel or a non-ferrous metal.

5.5 Hose Fasteners:

All hose fasteners shall be of stainless steel and capable of withstanding the required test pressure and shall be in accordance with SABS 814.

5.6 Hose Connection:

The connection between the pump and the hose reel shall consists of 32 mm diameter galvanised mild steel piping of medium class in accordance with SABS 62 firmly secured at a maximum of 1,5 m intervals and extending from the hose reel within 1 metre of the pump and outlet. From this point onwards a 32 mm flexible hose, with an instantaneous coupling compatible with the pump outlet shall be provided.

5.7 Connectors and Couplings:

Fire hose connectors shall be in accordance with SABS 1128 Part 2; fittings on the steel pipe shall be galvanised malleable cast-iron fittings complying with SABS 509.

5.8 Test:

The fire hose, reel waterway and connecting pipes shall be subjected to a test pressure of approximately (but not less than) 1 400 kPa after all air has been expelled and with the nozzle-cock shut. Hose clips and water-seals may be adjusted should minor leaks occur. After such adjustment the test shall be repeated.

6. FIRE-FIGHTING EQUIPMENT

6.1 Suction Hoses and Fittings:

The following suction pipes and fittings shall be provided:

6.1.1 Two 25 m lengths of 100 diameter armoured suction hose complete with screwed fitting of, if required, adaptors to suit the pump suction inlet. The thread of the coupling fitting shall be in accordance with SABS 1128 Part 2.

6.1.2 One suction strainer with screw fitting to suit suction hose coupling.

6.1.3 Suction hose from tank with female screwed fitting or, if required, adaptors to suit the pump suction inlet.

6.1.4 Two suction coupling wrenches.

6.2 Discharge Hoses and Fittings:

The following discharge hoses and fittings shall be provided:

6.2.1 Six 30 m lengths of 38 mm plastic coated fire hose in accordance with SABS 1456 Part 4 complete with 63,5 mm instantaneous couplings in accordance with SABS 1128 Part 2.

6.2.2 Three 30 m lengths of 63,5 mm plastic coated fire hose in accordance with SABS 1456 Part 4 complete with 63,5 mm instantaneous couplings in accordance with SABS 1128 part 2.

6.2.3 Two 63,5 mm instantaneous branch pipes acceptable to the Department with ball valve shut-off, water curtain and each with 8 mm, 10 mm and 12 mm replaceable nozzles.

6.2.4 One 63,5 mm dividing breeching with instantaneous couplings in accordance with SABS 1128 Part 2.

6.3 Sundry Fire Equipment:

The following sundry fire fighting equipment shall be provided:

6.3.1 Two 9 kg rechargeable dry powder fire extinguishers in accordance with SABS 810 in vehicle brackets.

6.3.2 Two pairs of long asbestos heat-resistant gloves.

6.3.3 Two black fireman's helmets complete with foldback face shield all as classified by the Underwriters Laboratories Inc in accordance with the National Fire Protection Association's standard for helmets for structural fire fighting.

6.3.4 One $1^{1}/_{2}$ kg felling axe.

6.3.5 One 800 mm crowbar.

6.3.6 One 0.75 kg carpenter's hammer with stainless steel handle and leather grip.

6.3.7 One 600 mm bolt-cutter as Record 940, Rigid 345 or other approved to cut 10 mm diameter mild steel.

6.3.8 One 6 m effective length triple extending aluminium alloy ladder in accordance with SABS 1304.

6.3.9 Two inspection lamps of capacity of at least 40 Watt having matching wandering leads at least 10 m long and fitted with waterproof male type connections shall be supplied and stowed in a suitable locker on the trailer. The inspection lamps shall also be provided with adjustable mountings. One mounting is to be provided at the front end of the trailer and one at the back.

6.3.10 A 12 Volt battery with a minimum capacity of 50 Amp-hours in accordance with SABS 2 in a suitable weatherproof housing. Electrical wiring in galvanised conduiting shall be provided between this power source and weatherproof female power outlets near the mountings for the two inspection lamps specified above.

This power source shall also provide electricity to the red flashing light specified under 'Trailer'. A weatherproof switch shall be provided near the battery to change over from the supply from the towing vehicle to the battery supply.

(Note: It shall be possible to charge this battery from the trickle-charger specified for the pump engine.)

6.3.11 One halogen spotlight of at least 55 Watt rating with its own 12 Volt battery of approximately 24 Amp-hour capacity. The battery shall be provided with a satchel type carrying case so that the light can be used away from the trailer. The battery shall be stored in its own weatherproof housing when not in use or, alternatively, in the same housing as the battery for the two inspection lamps and the flashing red light.

*(Note: It shall also be possible to charge this battery off the trickle-charger for the pump engine. Should the charger for the pump engine **not** be compatible with these batteries an additional trickle-charger shall be provided.)*

6.3.12 A hydrometer in a wooden case mounted in one of the lockers shall be provided for the testing of all batteries.

7. TOOLS AND SPARES

The following suction pipes and fittings shall be provided:

7.1 Spare Wheel:
One spare wheel for the trailer plus wheel spanners.

7.2 Jack:
One $1^{1}/_{2}$ ton hydraulic jack and handle.

7.3 Tools:
Consumable spares including condensor, breakerpoints, set of spark plugs, all pump packings, suction pipe and delivery pipe packings, spare filters, etc.

7.4 Operator's Manual:
The Operators Manual shall include all the instructions and information required for the operation of the unit, equipment and special attachments. These instructions shall include lubrication, charts, engine power curves, pump delivery curves, regular maintenance and readiness checks.

7.5 Parts Manual:
The Parts Manual shall include illustrations and exploded views as necessary for the proper identification of all parts, subassemblies, assemblies and units, including that of the pump and engine. All items shall be identified by reference numbers corresponding to the parts list in a

numerical index, which shall show the description and quantity to be used on the unit. Any special characteristics applicable to the parts shall be identified.

8. GENERAL REQUIREMENTS

8.1 Workmanship:

The tank and trailer unit shall be free from sharp or jagged edges or corners, loose grab rails, loose or slippery foot surfaces, and chips, cracks or blistering in any painted or plated surface. Hoses, the ladder and any other detachable equipment shall be safely stowed.

8.2 Painting:

The tank and trailer unit shall be painted with a prime coat, an undercoat and two coats of high gloss Post Office Red as D30 of CKS 279. The last two coats may be applied with a spray gun. All galvanised surfaces shall previously be treated with an etching primer coat.

8.3 Marking:

The tank and trailer unit shall be provided with a mass data plate in a conspicuous position on the left hand side of the trailer in accordance with the relevant Provincial Road Traffic Ordinance.

8.4 Roadworthy Certificate:

The unit shall be delivered as described elsewhere with a roadworthy certificate.

8.5 Guarantee:

Each unit is to be guaranteed for at least 12 months against defective material, defective workmanship or faulty design, fair wear and tear excepted. Guarantee conditions to be clearly stated by tenderer.

8.6 Expected Lifetime

In order to avoid mechanical failures while fighting a fire, tenderers should give an estimate of the number of hours the pump set can be operated safely between overhauls.

8.7 Delivery Period:

Tenderers offering a short delivery period may receive preference.

8.8 Occupational Health and Safety:

All equipment covered by this specification shall comply in every respect in the “Occupational Health and Safety Act of 1993 (Act 85/1993)” as amended.

8.9 Television and Radio Interference:

The equipment described in this specification may under no circumstances cause any interference to television or radio reception and tenderers are required to guarantee the equipment offered by them accordingly.

9. TENDERING REQUIREMENTS

9.1 Completing Annexure A:

Tenderers are required to fill in full details of the equipment offered by them next to each item in Annexure A.

9.2 Specification and Pamphlets:
This Specification, duly completed, together with pamphlets and trade literature of all equipment offered, shall be attached to the tender document.

9.3 Pump Duty Curves:
The tenderer shall provide particulars of the duty curves of the pump under the two conditions specified in the table provided in Annexure A, which forms part of this document.

This is in addition to that shown on pamphlets and brochures.

9.4 Engine Performance:
The engine power developed at various speeds at sea level as well as 2 500 m above sea level shall be entered in the table provided in Annexure A, which forms part of this document.

9.5 Drawings and Photographs:
Drawings and photographs showing the complete unit.

9.6 Inspection of Unit
The successful tenderer will be required to give the Fire Prevention Section of the Department one week's notice when the unit is ready at their premises for delivery to enable the Department to arrange for an inspection and to witness a demonstration to be conducted by the supplier.

10. SCHEDULE OF PARTICULARS AND INFORMATION FROM TENDERERS

THE SCHEDULE WHICH ACCOMPANIES THIS TENDER NOTICE, FORMS AN INTEGRAL PART OF IT AND MUST BE DULY COMPLETED IN EVERY DETAIL, FAILING WHICH THE TENDER IN QUESTION MAY BE REJECTED.

Under no circumstances will statements such as the following be acceptable to the Department:

"See attached pamphlets."
"Refer to catalogue."
"Data to follow."
"As given by supplier, etc."

Equipment offered and listed in the Schedule must be capable of performing the specified duties and shall comply in all respects with the requirements of the specification.

SHOULD it transpire that such equipment, even when offered by make, model and/or type, is unsuitable of meeting or performing in accordance with the Specification requirement in any respect, the Contractor or Subcontractor shall nevertheless be responsible for any additional costs incurred in providing the required or suitable equipment.

Whenever a specific make, model or type of equipment has been prescribed in the Specification and

the tenderer offers an alternative, or equal make or type of equipment in his tender, the Department will, on acceptance of such a tender, inform the prospective Contractor in writing as to the make and/or type of equipment accepted. HOWEVER, it should be noted that the use of words "OR EQUAL" by the tenderer is to be discouraged and could lead to the disqualification of the tender.

THE CONTRACTOR WILL NOT BE ALLOWED TO SUPPLY EQUIPMENT OTHER THAN THAT OFFERED IN HIS TENDER WITHOUT THE WRITTEN APPROVAL OF THE DEPARTMENT.

ANNEXURE A - TO THE STANDARD TECHNICAL SPECIFICATION FOR THE SUPPLY OF A TANK AND TRAILER FIRE FIGHTING UNIT WITH PETROL DRIVEN CENTRIFUGAL PUMP AND SUNDRY ACCESSORIES

SCHEDULE OF PARTICULARS AND INFORMATION FROM TENDERERS

ITEM NO 1	**TRAILER AND TANK**	
1.1	Type of frame (hot rolled section or tubular)	
1.2	Size of main members	
1.3	Size of wheels	
1.4	Size of tyres	
1.5	Details of suspension system	
1.6	Details of braking system	
1.7	Gauge of tank material	mm
1.8	Dimensions of tank	
1.9	Capacity of tank	litres
1.10	Mass of tank and trailer without equipment	kg
1.11	Mass of tank and trailer when full with all equipment specified	kg
ITEM NO 2	**PUMP AND ENGINE SET**	
2.1	Make of pump offered	
2.2	Make of engine offered	
2.3	Manufacturer's model number of pump	
2.4	Manufacturer's model number of engine	
2.5	Country of origin of pump	
2.6	Country of origin of engine	
2.7	Year of manufacture of pump	
2.8	Year of manufacture of engine	
2.9	Number of stages of pump	
2.10	Diameter of impeller	mm
2.11	Material of pump casing	
2.12	Material of impeller	
2.13	Material of pump shaft	
2.14	Type of bearings of pump	
2.15	Type of seals on pump	
2.16	Method of coupling of pump to engine	
2.17	Size of inlet (if not 100 mm) of pump	mm
2.18	Details of priming mechanism	
2.19	Particulars of strainer	
2.20	Capacity of engine	
2.21	Number of cylinders	

2.22	Bore mm Stroke mm			
2.23	Compression ratio of engine			
2.24	Type of liners			
2.25	Type of valves (overhead or side)			
2.26	Material of pistons			
2.27	Fuel consumption per hour under full load			- litre
2.28	Method of cooling			
2.29	Maximum power developed			kW
2.30	Engine speed at above power			rpm
2.31	Engine power at other speeds			
	Engine Speed		Power Developed	
	rpm		kW	
	rpm		kW	
	rpm		kW	
	rpm		kW	
2.32	Maximum torque			Nm
2.33	Number of main bearings			
2.34	Make and type of regulator			
2.35	Details of oil filter			
2.36	Details of fuel filter			
2.37	Details of air filter			
2.38	Spark plugs protected or open			
2.39	Fuel tank capacity			litres
2.40	Type and make of battery			
2.41	Capacity of battery			amp – hours
2.42	Make of trickle-charger			
2.43	Pump and engine performance at 2 500 m above sea level with suction lift of 1,5 m			
	Pump delivery rate	Delivery issue	Pump Speed	Power absorbed at shaft
	0 litre / min	kPa	rpm	kW
	200 litre / min	kPa	rpm	kW
	550 litre / min	kPa	rpm	kW
	900 litre / min	kPa	rpm	kW
2.44	Pump and engine performance at sea level with total suction lift of 5,0 m			
	Pump delivery rate	Delivery issue	Pump Speed	Power absorbed at shaft
	0 litre / min	kPa	rpm	kW
	200 litre / min	kPa	rpm	kW
	550 litre / min	kPa	rpm	kW
	900 litre / min	kPa	rpm	kW
2.45	Total mass of pump, motor and frame			kg

2.46	Expected period of operation between overhauls	hours
ITEM NO 3	**HOSE REEL**	
3.1	Country of origin	
3.2	Name of manufacturer	
3.3	Year of manufacture	
3.4	Outside diameter of drum	mm
3.5	Inside diameter of drum	mm
3.6	Internal width of drum	mm
3.7	Material and type of discs	
3.8	Description of drum core	
3.9	Make of swivel joint	
3.10	Method of mounting hose reel on pipe frame	
3.11	Type of bearings	
3.12	Make of hose supplied	
3.13	Is the hose according to SABS 988?	Yes / No
3.14	Material of nozzle-cock	
ITEM NO 4	**SUCTION HOSE**	
4.1	Make of 100 diameter armoured suction hose	
4.2	Make of suction strainer	
4.3	Material of suction strainer	
ITEM NO 5	**FIRE HOSES**	
5.1	Make of 63,5 m diameter fire hose	
5.2	Make of 38 m diameter fire hose	
5.3	Are the hoses in accordance with SABS 1456 Part 4?	Yes / No
5.4	Make of branch pipe nozzle and ball shut-off valve	
5.5	Make of couplings	
5.6	Are the couplings in accordance with SABS 1128 Part 2?	Yes / No

ITEM NO 6	**FIRE EXTINGUISHERS**	
6.1	Make	
6.2	Name of supplier	
6.3	Are the extinguishers in accordance with SABS 810?	Yes / No
ITEM NO 7	**HEAT-RESISTING GLOVES (LONG)**	
7.1	Make	
7.2	Name of supplier	
ITEM NO 8	**FIREMAN'S HELMET**	
8.1	Make	
8.2	Model	
8.3	Is the helmet complete with face shield?	Yes / No
8.4	Is the helmet in accordance with the National Fire Protection Association's Standard?	Yes / No
8.5	Name of supplier	
ITEM NO 9	**BOLT CUTTER**	
9.1	Make	
9.2	Model	
ITEM NO 10	**LADDERS**	
10.1	Make of ladder	
10.2	Mass of ladder	kg
10.3	Is the ladder in accordance with SABS 1304?	Yes / No
ITEM NO 11	**INSPECTION LAMPS**	
11.1	Make	
11.2	Model	
11.3	Capacity	Watts
ITEM NO 12	**RED FLASHING LIGHT**	
12.1	Make	
12.2	Model	
12.3	Rating	Watts

ITEM NO 13	**SPOTLIGHT**	
13.1	Make	
13.2	Model	
13.3	Rating	Watts
ITEM NO 14	**BATTERIES FOR INSPECTION LAMPS, RED FLASHING LIGHT AND THE SPOTLIGHT**	
14.1	Make	
14.2	Battery type	
14.3	Guarantee period	
14.4	Capacity of battery for the inspection lamps and red flashing light	amp-hours
14.5	Capacity of battery for the spotlight	amp-hours
14.6	Is a separate trickle-charger required for the batteries	Yes / No
14.7	If “Yes” state:	
14.7.1	Make	
14.7.2	Country of origin	
14.7.3	Type of charger	
14.7.4	Maximum charging capacity	amps