ANNEXTURE C3.2

SCOPE OF WORK

MAINTENANANCE SERVICES OF FIRE DETECTION AND GAS SUPPRESSION SYSTEM, PA ADDRESS AND EMERGENCY EXIT ALARMS AT VARIOUS RANDWATER SITES FOR A PERIOD OF 24 MONTHS

1. PURPOSE

The purpose of the document is to procure services of a suitably qualified Fire prevention and protection systems contractor for maintenance services of fire detection and gas suppression system, sprinkler system, pa address and emergency exit alarms at various Rand Water sites for a period of 24 months.

The sites are as follows:

Rietvlei (RV)

Analytical Services (AS)

Process Technology (PT)

Water Wise House (WWHSE)

2. STATUTORY AND REGULATORY REQUIREMENTS

The existing equipment shall be maintained and commissioned in compliance with the following applicable regulations:

- SANS 10400 – 2011 The application of the National Building Regulations
- SANS 10142-1:2009; The code of practice for wiring of a premises as amended.
- SANS 1475
- SANS 246
- SANS 14520
- SANS 10139
- National Building Regulations and standard Act 103 of 1977
- Occupational Health and safety Act 85 of 1993
- Quality Management System requirement ISO 9001:2015
- Environmental management system ISO 14001; 2015
- Occupational Health and safety Management System ISO 45001:2018

The service provider shall, at the request of Rand Water's representative, conduct a complete inspection to evaluate the equipment relevant to the works and submit an assessment report detailing the items that require maintenance/ repairs.

3. QUALITY OF MATERIAL AND WORKMANSHIP

- All materials shall be new, undamaged and free from rust or other defects. Only material of the best quality, which has been approved by RW's representative, shall be used.
- Where applicable, all material shall be in accordance with the relevant standard specifications of the South African Bureau of Standards
- The installation shall be carried out according to the latest modern engineering practices.
- Rand Water's representative reserves the right to reject any work or part thereof that, according to his judgement, does not meet the highest standards of material and workmanship and to enforce replacement of the work at the expense of the *Contractor*.
- The *Contractor* shall institute an approved Quality Assurance system (QA), which shall be submitted to the *Project Manager* for his approval. The records of this QA system shall be kept throughout the duration of the contract and be submitted to the *Project Manager* at regular intervals as required by the *Project Manager*
- The spare parts used for replacements shall be from an authorised reseller of the same make/ quality.
- The Contractor shall maintain a service logbook with all job cards signed by the Building Supervisor.

4. OPERATIONAL HOURS

Rand Water facilities are operational 24 hours. Normal working hours for this service shall be considered as from 08:00 to 16:30. Down-time of Fire Detection for routine maintenance shall be arranged with the building supervisor to suit Rand Water operations.

5. ROUTINE MAINTENANCE

5. 1 SERVICE SANS 14520: GAS SUPPRESSION

Please Note:

a) All requirements (reports) as per (Annex A –H) shall be put together in a Fire Protection Safety File.
b) A Cloud Based Data system shall be linked to all responsible personnel at Rand Water.
c) Pictures (Date and Location) – Photographic evidence.

Every 12 months:

- All Gas Suppression Systems shall be thoroughly inspected and tested for proper operation by competent personnel annually (12 months) as per SANS 14520 9.2.1.1
- All annual inspection records and recommendations shall be provided to the owner of the building by the servicing company. We require the records to be in a Fire Protection Safety File.
- Rand Water shall keep such records as required under SANS 14520 9.2.1.2
- Where container pressure gauges or weight-monitoring devices are used for this purpose, they shall be compared to a separate calibrated device at least annually (12 months) SANS 14520 9.2.2.3 (a) for all Inert Gases
- All system hoses shall be examined annually (12 months) for damage. If visual examination shows any defect, the hose shall be replaced as per SANS 14520 9.2.3
- At least every 12 months it shall be determined whether boundary penetration or other changes to the protected enclosure have occurred that could affect leakage and extinguishant performance as per SANS 14520 9.2.4.1
- If this cannot be visually determined, it shall be positively established by repeating the test for enclosure integrity in accordance with Annex E as per SANS 14520 9.2.4.1

Every 6 months:

- Check container content every 6 months as per SANS 14520 9.2.2.3
- Refill or Replace the Liquid Content if a container shows a loss in extinguishant quantity of more than 5% as per SANS 14520 9.2.2.3 (a) for all Liquefied Gases
- Refill or Replace the Liquid Content if a container shows a loss in extinguishant quantity of more than 5% as per SANS 14520 9.2.2.3 (a) for all Liquefied Gases
- Refill or Replace the Liquid Content if a container shows a loss in pressure of more than 10% as per SANS 14520 9.2.2.3 (a)
- If an Inert Gas extinguishant container shows a loss in pressure of more than 5%, it shall be refilled or replaced.

Every 3 months:

- It is recommended that the type of hazard within the enclosure, and the volume it occupies, be regularly checked to ensure that the required concentration of extinguishant can be achieved and maintained as per SANS 14520 9.2.4.3

- Monthly: Check that all personnel who may have to operate the equipment or system are properly trained and authorized to do so and, in particular, that new employees have been instructed in its use as per SANS 14520 9.3.2(b)

Weekly:

- Weekly: Visually check the hazard and the integrity of the enclosure for changes which might reduce the efficiency of the system. Carry out a visual check that there is no obvious damage to pipework and that all operating controls and components are properly set and undamaged. Check pressure gauges and weighing devices, if fitted, for correct reading and take the appropriate action specified in the users' manual as per SANS 14520 9.3.2(a)

Procedures:

- All extinguishant removed from containers during service or maintenance procedures shall be collected and recycled, or disposed of in an environmentally sound manner, and in accordance with existing laws and regulations as per SANS 14520 9.2.1.4
- Where the integrity test reveals increased leakage that would result in an inability to retain the extinguishant for the required period, remedial action shall be carried out as per SANS 14520 9.2.4.2
- Where it is established that changes to the volume of the enclosure or to the type of hazard within the enclosure, or both, have occurred, the system shall be redesigned to provide the original degree of protection as per SANS 14520 9.2.4.3
- The user shall carry out a programme of inspection, arrange a service schedule, and keep records of the inspections and servicing as per SANS 14520 9.3.1
- The installer shall provide the user with an inspection programme for the system and components. The programme shall include instructions on the action to be taken in respect of faults as per SANS 14520 9.3.2
- The user's inspection programme is intended to detect faults at an early stage to allow rectification before the system may have to operate as per SANS 14520 9.3.2
- A service schedule shall include requirements for periodic inspection and test for the complete installed system, including pressurized containers, as specified in the appropriate national standards. The schedule shall be carried out by a competent person who shall provide the user with a signed, dated report of the inspection, advising any rectification carried out or needed as per SANS 14520 9.3.3, the schedule shall be as per Annex F
- Personnel working in an enclosure protected by a gaseous extinguishant shall receive training in the operation and use of the system, in particular regarding safety issues as per SANS 14520 9.4

5. 2 SERVICE SANS 10139: SMOKE DETECTION

Every 12 months:

Recommendations (SANS 10139 12.2.3):

The following recommendations are applicable:

a) The records of false alarms should be checked in accordance with SANS 10139 9.1.2(i). The rate of false alarms during the previous 12 months should be recorded (see SANS 10139 9.1.2(i)). Action taken in respect of false alarms recorded should comply with the recommendations of SANS 10139.1.2(j).
b) The standby battery should be disconnected, and full load alarm should be simulated.
c) Batteries and their connections should be examined and momentarily load tested with the mains disconnected (other than those within devices such as manual call points, detectors and fire alarm sounders of a radio-linked system), to ensure that they are in good serviceable condition and not likely to fail before the next service visit. Vented batteries should be examined to ensure that the specific gravity of each cell is correct.

Recommendations (SANS 10139 12.2.4):

The following recommendations are applicable:

a) The switch mechanism of every manual call point should be tested, either by removal of a frangible element, insertion of a test key or operation of the device as it would be operated in the event of fire.
b) All automatic fire detectors should be examined, as far as practicable, to ensure that they have not been damaged, painted, or otherwise adversely affected. Thereafter, every detector should be functionally tested. The tests used need prove only that the detectors are connected to the system, are operational and are capable of responding to the phenomena they are designed to detect.
c) Every heat detector should be functionally tested by means of a suitable heat source, unless operation of the detector in this manner would then necessitate replacement of part or all of the sensing element (e.g. as in fusible link point detectors or non-integrating line detectors). Special test arrangements will be required for fusible link heat detectors. The heat source should not have the potential to ignite a fire; live flame should not be used, and special equipment might be necessary in explosive atmospheres.
d) Point smoke detectors should be functionally tested by a method that confirms that smoke can enter the detector chamber and produce a fire alarm signal (e.g. by use of apparatus that generates simulated smoke or suitable aerosols around the detector). It should be ensured that the material used does not cause damage to, or affect the subsequent performance of, the detector; the manufacturer's guidance on suitable materials should be followed.
e) Optical beam smoke detectors should be functionally tested by introducing signal attenuation between the transmitter and receiver, either by use of an optical filter, smoke or simulated smoke.

f) Aspirating fire detection systems should be functionally tested by a method that confirms that smoke can enter the detector chamber and produce a fire alarm signal. It should be ensured that the material used does not cause damage to or affect the subsequent performance of the detectors; the manufacturer's guidance on suitable materials should be followed. Furthermore, appropriate testing should be performed to verify that smoke is able to enter each sampling point (or collection of sampling points that are recommended by the manufacturer to cover the same area as a point smoke detector). This can be achieved by introducing smoke into each sampling point in turn and verifying a response at the detector. However, where access is restricted or other site conditions prevent this, other verification techniques should be employed such as:
    - verifying transport time from furthest hole or a dedicated test point and comparing with previously recorded results to identify deviations;
    - confirming that the flow monitoring is capable of detecting loss of a single sampling point or collection of sampling points that are deemed to be acceptable for the risks involved;
    - inspecting flow readings and comparing with previously recorded results to identify deviations which would indicate a loss of detection performance;
    - measuring the pressure at each sampling point and comparing with previously recorded results to identify deviations which would indicate a loss of detection performance.

    The technique used is dependent on the particular features of the ASD technology, the risk and details of the specific application. Such techniques may also be supported by visual inspection of sampling points where this is possible but it is essential to verify that adequate detection performance is maintained. Details of the techniques used should be recorded and agreed with all parties.

g) Carbon monoxide fire detectors should be functionally tested by a method that confirms that carbon monoxide can enter the detector chamber and produce a fire alarm signal (e.g. by use of apparatus that generates carbon monoxide or a gas that has a similar effect on the electrochemical cell as carbon monoxide).
h) Flame detectors should be functionally tested by a method that confirms that the detector will respond to a suitable frequency of radiation and produce a fire alarm signal. The guidance of the manufacturer on testing of detectors should be followed.
i) In fire detection systems that enable analogue values to be determined at the control and indicating equipment, it should be confirmed that each analogue value is within the range specified by the manufacturer.
j) Multi-sensor detectors should be operated by a method that confirms that products of combustion in the vicinity of the detector can reach the sensors and that a fire signal can be produced as appropriate. The guidance of the manufacturer on the manner in which the detector can be functionally tested effectively should be followed.
k) All fire alarm devices should be checked for correct operation. It should be confirmed that visual fire alarm devices are not obstructed from view and that their lenses are clean.
l) All unmonitored, permanently illuminated filament lamp indicators at control and indicating equipment should be replaced.
m) Radio signal strengths in radio-linked systems to which SANS 10139 8.20 applies should be checked for adequacy.

n) A visual inspection should be made to confirm that all readily accessible cable fixings are secure and undamaged.
o) The cause-and-effect programme should be confirmed as being correct.
p) The standby power supply capacity should be checked to establish it remains suitable for continued service.
q) All further annual checks and tests recommended by the manufacturer of the control and indicating equipment and other components of the system should be carried out. On completion of the work, any outstanding defects should be reported to the responsible person and a record of the inspection and test should be made on the servicing certificate.

Every 6 months:

- Voice alarm systems shall be functionally tested, comprehensively every six months in accordance with the recommendations of SANS 7240-16 or SANS 7240-19 as per SANS 1013 9.3.2(f)
- The recommended period between successive inspection and servicing visits should not exceed six months as per SANS 10139 12.2.3

Recommendations (SANS 10139 12.2.3):

The following recommendations are applicable:

a) The system log book should be examined. It should be ensured that any faults recorded have received appropriate attention.
b) A visual inspection should be made to check whether structural or occupancy changes have affected the compliance of the system with the recommendations of this standard for the siting of manual call points, automatic fire detectors and fire alarm devices. Particular care should be taken to verify whether:

Recommendations (SANS 10139 12.2.3):

The following recommendations are applicable:

f) The fire alarm functions of the control and indicating equipment should be checked by the operation of at least one detector or manual call point on each circuit. An entry should be made in the log book indicating which initiating devices have been used for these tests.
g) The operation of the fire alarm devices should be checked.
h) All controls and visual indicators at control and indicating equipment should be checked for correct operation.
i) The operation of any facility for automatic transmission of alarm signals to an alarm receiving centre should be checked. Where more than one form of alarm signal can be transmitted (e.g. fire and fault signals), the correct transmission of each signal should be confirmed.
j) All ancillary functions of the control and indicating equipment should be tested.
k) All fault indicators and their circuits should be checked, where practicable, by simulation of fault conditions.
l) All printers should be tested to ensure that they operate correctly and that characters are legible. It should be ensured that all printer consumables are sufficient in quantity or

condition to ensure that the printer can be expected to operate until the time of the next service visit.

m) Radio systems of all types should be serviced in accordance with the recommendations of the manufacturer.
n) All further checks and tests recommended by the manufacturer of the control and indicating equipment and other components of the system should be carried out.
o) On completion of the work, any outstanding defects should be reported to the responsible person, the system log book (see SANS 10139 11.2.2(d)) should be completed and a servicing certificate should be issued (see annex G).

Visual Inspection Checklist:

1) All manual call points remain unobstructed and conspicuous;

2) Any new exits have been created without the provision of an adjacent manual call point;

3) Any new or relocated partitions have been erected within 500 mm horizontally of any automatic fire detector (see SANS 10139 8.15.3(g));

4) Any storage encroaches within 300 mm of ceilings, such as to obviate compliance with SANS 10139 8.15.3(i);

5) A clear space of 500 mm is maintained below each automatic fire detector (see SANS 10139 8.15.3(n)), and that the ability of the detector to receive the stimulus that it has been designed to detect has not been impeded by other means;

6) Any changes to the use or occupancy of an area make the existing types of automatic fire detector unsuitable for detection of fire or prone to unwanted alarms;

7) Any building alterations or extensions require additional fire detection and alarm equipment to be installed.

Every Month:

- In premises in which some employees only work during hours other than that at which the fire alarm system is normally tested, an additional test(s) should be carried out at least once a month to ensure familiarity of these employees with the fire alarm signal(s) as per SANS 10139 12.1.2(c).

- If an automatically started emergency generator is used as part of the standby power supply, it should be started up once each month by simulation of failure of the normal power supply and operated on-load for at least 1 h. The test should be carried out in accordance with the instructions of the generator manufacturer, including instructions on the load that should be operated. At the end of the test, the fuel tanks should be left filled, and the oil and coolant levels should be checked and topped up as necessary.

- All vented batteries and their connections should be examined by a person competent in battery installation and maintenance technology. Electrolyte levels should be checked and topped up as necessary.

Weekly

- Every week, a manual call point should be operated during normal working hours. It should be confirmed that the control equipment is capable of processing a fire alarm signal and providing an output to fire alarm sounders, and to ensure that the fire alarm signal is correctly received at any alarm receiving centre to which fire alarm signals are transmitted. It is not necessary to confirm that all fire alarm sounder circuits operate correctly at the time of this test as per
  SANS 10139 12.1.2(a)

- The weekly test should be carried out at approximately the same time each week; instructions to occupants should then be that they should report any instance of poor audibility of the fire alarm signal. In systems with staged alarms incorporating an "Alert" and an "Evacuate" signal, the two signals should be operated, where practicable, sequentially in the order they would occur at the time of a fire (i.e. "Alert" and then "Evacuate") as per SANS 10139 12.1.2(b)

- The duration for which any fire alarm signal is given (other than solely at control and indicating equipment) at the time of the weekly test by the user should not normally exceed 1 min, so that, in the event of a fire at the time of the weekly test, occupants will be warned by the prolonged operation of the fire alarm devices as per SANS 10139 12.1.2(e)

Procedures:

- A different manual call point should be used at the time of every weekly test, so that all manual call points in the building are tested in rotation over a prolonged period. There is no maximum limit for this period (e.g. in a system with 150 manual call points, the user will test each manual call point every 150 weeks). The result of the weekly test and the identity of the manual call point used should be recorded in the system log book as per SANS 10139 12.1.2(d)
- If vented batteries are used as a standby power supply, a visual inspection of the batteries and their connections should be made to ensure that they are in good condition. Action should be taken to rectify any defect, including low electrolyte level.

6. AD HOC REPAIRS (RV, AS, PT, WWHSE)

The contractor is required to have a 24/365 call out facility. The maximum response time which the contractor must respond shall be less than 30 minutes.

The contractor shall ensure that standby arrangements for emergency call outs are at all times in place with contact details of the technicians on standby.

All ad hoc and miscellaneous repairs in this tender will be treated as “as and when” the service is needed.

The contractor will not be entitled to claim any of the amounts listed in ad hoc repairs unless work has been carried out. Such work must be first be requested by Rand Water official and the reference number quoted in all job cards.

The Contractor shall be required to comply with the following benchmarks:

Fire and Gas Detection Systems

System availability 95%

Response Time (office hours) 2 hours

Response Time (after working hours) 4 hours

Emergency Call Out (24/7/365) 1 hour.

NB: Dated photographic evidence and detailed inspection report to be submitted with invoice after each service. No invoice will be processed without this information.

5.2 CALL OUT FOR REPAIRS

Call out services shall include attending to any complaint any time of the year, on receipt of written complaint from the Building Foreman or Manager. A record of the break-down calls attended duly acknowledged by the occupant or end user.

5.3 LATENT DEFECTS

In case it is found at later date that the work conducted is of inferior quality and proper action was not taken at the time of execution of the work, the Contractor shall remain liable to repair at his own cost or pay compensation to the Rand Water for inferior works as determined by the Client.

Rand Water Scientific Services is a 24-hour operational facility. Normal working hours for this service shall be considered as from 08:00 to 16:30. Down-time of Fire Detection for routine maintenance shall be arranged with the building supervisor to suit Rand Water operations.

7. INFRASTRUCTURE

FIRE DETECTION AND GAS SUPPRESSION SYSTEM INFRASTRUCTURE (Scientific Services)

Building	Type of Panel	No. of Sigma's	Area covered	No of fire detectors	No of smoke detectors	Manual call point (MCP)	No. of Sounders / bell	No. Cylinder (FM 200)
Analytical service	Zyton two-way addressable way	10	Entire Building	200	9	10	5	8
PROCESS TECHNOLOGY	Techno switch		Entire Building incl	85	2	5	2	-
WWHSE	Sigma conversional		Entire	12	2	2	1	
VIROLOGY – Supply, delivery and installation	Addressable panel			10		2	1	1

FIRE DETECTION AND GAS SUPPRESSION SYSTEM INFRASTRUCTURE (RV NEW WING)

	Type of Panel	Gas control units	Area covered	No of smoke/detectors	No of sprinklers	Manual call point (MCP)	No. of Sounders / bell	No. Cylinder (FM 200)
Level 2	Zyton two-way addressable way	8	Entire Level	5	100	4	11	8
Level 3	Zyton two-way	0	Entire Level	13	300	2	1	-

	addressable way							
Level 4	Zyton two-way addressable way	4	Entire Level	33	400	4	2	4
Level 5	Zyton two-way addressable way	0	Entire Level	17	200	4	4	-

FIRE DETECTION AND GAS SUPPRESSION SYSTEM INFRASTRUCTURE (RV OLD WING)

	Type of Panel	No. of Sigma's	Area covered	No of smoke/detectors	No of sprinklers	Manual call point (MCP)	No. of Sounders / bell	No. Cylinder (FM 200)
Level 1	Zyton two-way addressable way	1	Entire Level	25	200	1	1	1
Level 2	Zyton two-way addressable way	5	Entire Level	30	350	4	3	9
Level 3	Zyton two-way addressable way	7	Entire Level	26	400	6	7	7
	Zyton two-way	1	Entire Level	16	500	4	1	1

Level 4	addressable way							
Level 4	Zyton two-way addressable way	-	Entire Level	8	100	3	1	

PA ADDRESS SYSTEM AND EMERGENCY EXIT ALARM INFRASTRUCTURE AT ANALYTICAL SERVICES

DESCRIPTION	Number of Amps / panels	Numbers of speakers / alarm
PA Address system	1	15
Emergency exit doors	1	12

8. RESPONSIBILITIES

RESPONSIBILITIES OF RAND WATER

The responsible Rand Water official will notify the Contractor, give a description of the problem, as they perceive it and merely give their opinion as to the reason or cause; however, Rand Water will not accept any responsibility for any information given with regard to the fault or its location or reasons, therefore.

Notification to the contractor will be done by means of a telephone call, or an e-mail. Records of notification will be kept and updated by the contractor.

Rand Water will afford the Contractor access to the works site and to such other places as may be necessary to enable the Contractor to carry out his/her duties.

9. RESPONSIBILITIES OF THE CONTRACTOR

The Contractor shall be responsible for the complete maintenance service, fully described and detailed in the Scope of Work. The Contractor shall establish and maintain a job card system and all repair work, modifications and descriptions of work done, shall be recorded on the job card system.

The names of the person who issued the instruction as well as the names of the contractor’s personnel who carried out the work shall be recorded on the job card.

Each job card shall be signed off by the employer's duly appointed representative.

Copies of each of the fully completed and signed job cards shall be submitted together with a summary of work done, when the work is invoiced for payment.

The Contractor shall carry out the necessary repair and maintenance work within the specified response and repair time, once notification has been given to the contractor to commence with the repair or maintenance work.

The Contractor shall maintain all the documents, supplied by Rand Water, in a neat and usable condition and shall return the documents, including the additional documents obtained during the course of the Contract to Rand Water on completion of the Contract. The Contractor shall update literature and drawings whenever he becomes aware of discrepancies in them.

10. CONTRACTORS PERFORMANCE

Depending on the severity of the maintenance or repair required, all repair work shall be concluded on the same day that it was reported; however, where the fault was reported after midday, the work so required shall be concluded by midday the following day, i.e., within 24 hours. Where the work to be done cannot be reasonably expected to be concluded within the time allocated, the due time for repair will be communicated to the employer for his approval thereof.

11. TERMS OF PAYMENT

A tax invoice for the monthly maintenance shall be submitted by the 25th of the month, payment thereof to be processed with the next cheque run i.e., before the end of the following month. This procedure will be followed for each monthly maintenance period.

All additional services, repair and charges for spares must first be discussed with the responsible Rand Water official. All the work in table 2 of the pricing schedule shall be carried out if requested by the Rand Water official.

12. AD HOC REPAIRS

The contractor is required to have a 24/365 call out facility. The maximum response time which the contractor must respond shall be less than 30 minutes.

The contractor shall ensure that standby arrangements for emergency call outs are at all times in place with contact details of the technicians on standby.

All ad hoc and miscellaneous repairs in this tender will be treated as "as and when" the service is needed.

The contractor will not be entitled to claim any of the amounts listed in ad hoc repairs unless work has been carried out. Such work must be first be requested by Rand Water official and the reference number quoted in all job cards.