TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

The following drawings form part of the tender and must be read in conjunction with this document. This drawings will be provided during the briefing session

- P24025-TN-FIR-100-REV 0B - BLOCK A, K, U GROUND AND BLOCK A LOWER GROUND FLOOR SMOKE DETECTION
- P24025-TN-FIR-101-REV 0B - BLOCK A 1ST, 2ND AND 3RD FLOOR
- P24025-TN-FIR-102-REV 0B - BLOCK A 4TH, 5TH, AND 6TH FLOOR
- P24025-TN-FIR-103-REV 0B - BLOCK A 7TH AND 8TH FLOOR
- P24025-TN-FIR-104-REV 0B - BLOCK B
- P24025-TN-FIR-105-REV 0B - BLOCK C LOWER GROUND FLOOR
- P24025-TN-FIR-106-REV 0B - BLOCK C GROUND FLOOR
- P24025-TN-FIR-107-REV 0B - BLOCK C 1ST FLOOR
- P24025-TN-FIR-108-REV 0B - BLOCK C 2ND FLOOR
- P24025-TN-FIR-109-REV 0B - BLOCK C 3RD FLOOR
- P24025-TN-FIR-110-REV 0B - BLOCK C 4TH FLOOR
- P24025-TN-FIR-111-REV 0B - BLOCK C 5TH FLOOR
- P24025-TN-FIR-112-REV 0B - BLOCK C 6TH FLOOR
- P24025-TN-FIR-113-REV 0B - BLOCK C 7TH FLOOR
- P24025-TN-FIR-114-REV 0B - BLOCK C 8TH FLOOR
- P24025-TN-FIR-115-REV 0B - BLOCK C 9TH FLOOR
- P24025-TN-FIR-116-REV 0B - BLOCK C 10TH FLOOR
- P24025-TN-FIR-117-REV 0B - BLOCK C ROOF
- P24025-TN-FIR-119-REV 0B - BLOCK H
- P24025-TN-FIR-120-REV 0B - BLOCK O GROUND FLOOR
- P24025-TN-FIR-121-REV 0B - BLOCK PT
- P24025-TN-FIR-122-REV 0B - BLOCK RT GROUND AND FIRST FLOOR
- P24025-TN-FIR-123-REV 0B - BLOCK S, M LOWER GROUND FLOOR
- P24025-TN-FIR-124 -REV 0B- BLOCK S,M,E,F,J GROUND FLOOR
- P24025-TN-FIR-125-REV 0B - BLOCK S,M,E,F,J FIRST FLOOR
- P24025-TN-FIR-126 -REV 0B- BLOCK T LOWER GROUND AND FIRST FLOOR
- P24025-TN-FIR-127-REV 0B - VA GROUND
- P24025-TN-FIR-128-REV 0B - BLOCK VA FIRST FLOOR
- P24025-TN-FIR-129-REV 0B - BLOCK VA SECOND FLOOR

- P24025-TN-FIR-130-REV 0B - BLOCK VL LOWER GROUND, GROUND MEZZANINE FLOOR
- P24025-TN-FIR-131-REV 0B - BLOCK Y GROUND FLOOR
- P24025-TN-FIR-300-REV 0B - SITE PLAN

The appointed contractor would be responsible for all required civil and building works required such as trenching and backfilling for fibre links.

Figure 1. Aerial Site View

1 SCOPE OF WORK

1.1 The SABS Groenkloof campus requires the provision of new fire detection and alarm systems for various buildings to be compliant with the South African national standard SANS 10139.

1.2 Manual call points shall be supplied and installed in the building in accordance with this specification and supplied drawings.

1.3 The new addressable fire control panels and graphics interface shall be installed in the various buildings in positions to be finalized and agreed with the engineer and the client and shall be networked by fibre link to be monitored by the graphics interface package.

1.4 All cables shall be new low smoke, zero Halogen fire resistant cables PH 30.

Cables will be installed in new conduits fixed with steel saddles every 500 mm to be supplied by the contractor.

1.5 The contractor shall supply, install, and commission a fully operable fire detection and alarm system in accordance with the specification.

1.6 Although the basic parameters for tender are laid down in this document it will be the responsibility of the contractor to ensure the final system will be compliant with SANS 10139.

1.7 Any discrepancies between site requirements and those within the document must be brought to the attention of the engineer and approved in writing before changes/ additions will be permitted.

1.7.1 Short falls of this specification, that do not meet the requirements of a SANS 10139 L1 + M system, must be pointed out to the client before commencement of the installation.

2 CODES OF PRACTICE.

2.1 The system shall be installed in strict compliance with the following SANS codes of practice: SANS 10139:2021 Code of practice for design, installation, commissioning and maintenance of fire detection and alarm systems in non-domestic premises

3 CATEGORY OF SYSTEM

3.1 The category of systems in accordance with SANS 10139:2021 for all buildings shall be L1+ M category unless otherwise specified.

3.1.1 It is the contractors' responsibility to ensure full compliance to this category and code of practice. Should there be shortfalls in this document not complying with the code of practice it shall be the contractors' responsibility to report such to the engineer.

4 CONTRACTOR REQUIREMENTS

4.1 All tenderers shall be a current member of the FDIA

4.2 All contractor staff to be used on this site shall be registered with SAQCC Fire for the relevant category for the work they perform.

4.3 Tenderers for this project shall have a track record of projects of this nature and provide proof of training on the equipment they install.

5 3RD PARTY INSPECTION

5.1 On request of the client a third party inspection can be conducted on the completed installation to confirm operability and conformance to the code of practice.

Shall any rectifications be called for by the third party inspector to provide full compliance and certification of the installation; it shall be for the cost of the contractor.

5.2 Costs for the first inspection are covered by the client.

6 WORKING HOURS

The contractor must submit his working hours to be approved by the client engineer. The buildings are occupied so the contractor shall ensure they create the least disturbance possible.

7 SYSTEM DESCRIPTION

7.1 GENERAL

7.1.1 The required installation shall be conducted in accordance with the design information in this document.

7.1.2 New addressable fire panels are to be installed as indicated on drawings and agreed with the engineer and client.

7.1.3 All new cabling shall be with new PH30 fire-rated cables. All cables shall be installed in PVC conduit with steel supports supplied by the contractor.
7.1.4 Cable routes and quantities of cable and conduit shall be verified by the contractor.

7.1.5 New manual call points and detection devices shall be installed as shown on the drawings. These manual call points shall be fitted with plastic covers to protect them from malicious action.

7.1.6 Fire siren/strobe lights shall be installed in positions indicated on the drawings.

7.2 BATTERY BACK UP

7.2.1 The contractor shall conduct battery calculations (to be included in hand over documentation) to ensure the fire panel batteries will continue to operate for 24 hours under mains power fail conditions plus 30 minutes in full alarm in accordance with SANS 10139.

New batteries shall be installed in the fire panel to coincide with the battery calculations.

7.3 ZONE BOCK PLAN

7.3.1 A zone block plan shall be supplied and mounted in a frame installed adjacent to all fire panels.

7.3.2 The block plans shall be correctly oriented, indicate the various system components, and the zone identification of each area. The block plan shall show the name and contact number of the contractor

7.4 LOGBOOK

7.4.1 A logbook shall be supplied and installed in a robust logbook holder adjacent to the fire panel.

7.5 CABLES AND CONDUIT

7.5.1 New low smoke, zero Halogen PH30 cables shall be installed throughout the system. Special note must be made of the requirement for low smoke, zero halogen cables.

7.5.2 Cable lengths shall be re-measurable – length of cable installed must be proved by means of as-built drawings indication reticulations routes.

7.5.3 CONDUIT

The contractor must allow for PVC conduit be run to each device in his tender bid. The PVC conduit must be supported with fire rated or steel saddles every 500mm. Existing conduit in good order may be re-used but must be provided with steel saddles every 500mm where this is not the case.

7.6 REMOTE MONITORING

7.6.1 All fire panels must be networked to a central control room which must be provided with a graphic interface package for ease of monitoring.

7.7 FIRE DETECTORS

7.7.1 Analogue addressable optical smoke detectors, heat detectors and bases shall be installed in positions as indicated on the drawings.

7.8 MANUAL CALL POINTS

7.8.1 New manual call points shall be installed in positions as indicated on the drawings

7.8.2 Manual call points shall be fitted with plastic flaps. These shall be secured with plastic tie downs. This shall be listed as a deviation in the design certificate.

7.8.3 Maximum travel distance to manual call points must not exceed 45 metres.

7.9 WARNING DEVICES

7.9.1 Warning devices shall be analogue addressable combined siren/strobe types installed as per design drawings.

7.9.2 During commissioning it must be confirmed that a sound level of 65db's is achieved in all areas of the premises.

7.10 LABELLING

7.10.1 All line devices shall be labelled.

8 SYSTEM INTERFACES

8.1 The fire system shall be interfaced with the access control to release the turnstiles in a fire condition.

9 VARIATIONS TO STANDARD

9.1 The systems shall be installed to comply with the rules of a category L1 + M of SANS 10139 system.

9.2 Variations to standard are:

(a) Flaps are to be fitted to the manual call points due to anticipated malicious actions from students.

10 SYSTEM CONFIGURATION

10.1 The system shall utilise two loops and shall be configured for the entire building.

10.2 The system shall utilise zones that will be agreed and will be indicated on construction drawings.

10.3 Any manual call point operating shall activate all the siren/ strobe units within that floor of the building.

11 SYSTEM OPERATION

11.1 On operation of a manual call point it shall:

- Operate all audible and visual warnings on the floor of the actuated call point.
- Operate common fire and zone fire on the fire panel.
- Indicate the actual manual call point and location on the LCD display
- Send a signal to the site radio system to signal the monitoring room.

11.2 A fault condition on the fire system shall operate the panel buzzer and send an alarm to the central monitoring point. No sirens shall activate.

11.3 Operation of two Manual call points within a single zone or the operations of the evacuation button on the fire control panel will operate all audible and visual alarms, throughout building and release the access-controlled doors.

12 SOAK TEST

2 Weeks

13 AUDIO EVACUATION SYSTEM

13.1 SYSTEM DESCRIPTION

An audio evacuation system shall be installed and shall incorporate the following:

- Zone selection unit for public announcements in individual zones or in all zones simultaneously.
- Booster amplifiers to feed evacuation to individual zones.
- Automatic and direct addressing from the main control room

Zones are as indicated on the zone schematic:

Block A and Block C must be provided with voice evacuation systems and shall be independent systems.

The evacuation racks shall be located in positions to be finalized before construction and agreed with the client and the engineer.

It shall be possible to address all zones individually or simultaneously from the main control.

All equipment for the audio evacuation system shall be housed in suitable 19 inch racks or enclosures approved by the engineer. Suitable power supply units shall be provided in the evacuation panel to provide electrical power to all the audio evacuation equipment. The rack shall also be equipped with ventilation fan units to prevent overheating of the equipment installed in the panels.

The audio evacuation system shall be carefully integrated with the smoke detection system. When a fire condition is detected in a specific fire zone, the evacuation system shall generate and transmit evacuation message in the affected area automatically.

The transmission of alarm and/or evacuation tones in any specific evacuation zone, or in all of the zones simultaneously, shall also be possible through operator control from the main panel, or remote panel. It shall also be possible to make public announcements over the evacuation system in any one, or in all of the different zones simultaneously. The sounding of announcement chimes shall precede public announcements. Suitable input modules located in the panel shall generate these chimes.

Backup batteries shall be provided and installed in the panel. These batteries shall be suitable to maintain the evacuation – and the smoke detection systems operational in the event of normal power failure to the panel. The batteries shall be rated to maintain the evacuation system operational for a period of four hours after normal power failure. The batteries shall during this period of four hours also maintain all monitoring functions associated with the evacuation system and have sufficient power at the end of the four hours to transmit an evacuation tone, in all zones associated with the panel, simultaneously for a duration of five minutes. Suitable battery charging circuitry to maintain the batteries in a fully charged state shall be provided in the panel.

13.2 MICROPHONE UNITS

These units shall include a 300mm dynamic microphone with cardioid response for speech frequencies with gooseneck stem attached to a small desk console and a press-to-talk button with lamp indicator.

13.3 SLAVE AMPLIFIERS

The amplifiers shall be fully protected against open and short circuits as well as against overloads and reactive loads. They shall be designed for continuous operation at maximum rated power.

These amplifiers shall comply with the following:

Mains input:	240V, 50Hz, 1-phase
Output power:	360W, 200W or 120W as Required
Output :	100V line balance
Frequency response :	50Hz to 20KHz
Distortion:	<1%
Output noise:	> - 80 dB
Input :	To suit pre-amp / mixer
Controls :	ON / OFF with lamp indicator

13.4 SPEAKERS

Provide and install loudspeakers in the positions as indicated on the drawings. The required 100V line transformers shall be located inside the back box of each speaker.

Speakers shall comply with the following requirements:

13.5 CEILING MOUNT SPEAKERS

Size :	150mm
Resonant frequency :	100Hz
Frequency response :	0Hz to 16KHz 10dB
Sensitivity:	86dB 3dB 1W/1M
Watts related :	5 Watts
Distortion:	5%
Impedance:	4 Ohm

13.6 HORN TYPE SPEAKERS

Size	:	200mm
Resonant frequency	:	100Hz
Frequency response:		0 to 12 KHz ± 10 dB
Sensitivity	:	120 dB ± 3 dB 1W/1M
Watts related	:	15 Watts RMS Continuous
Dispersion	:	110 degrees
Impedance	:	8 Ohm

13.7 POWER SUPPLY

Electrical power supply shall be provided by the Electrician at the main panel and all power supply units only. Installation of the electrical supply shall be in accordance with SABS regulations and shall be done by a qualified electrician.

13.8 CABLING AND WIRING

The loop-in system shall be followed throughout and no joints of any description will be permitted.

Existing redundant cabling and devices to be stripped out. Conduit in good condition may be re-used on approval by engineer, but must be supported with steel saddles every 500mm.
Fire resistant and screened cable shall be used for the fire detection and audio evacuation system. All cable shall be multi stranded. Single strand cables shall not be permitted. Fire resistant cables shall comply with a minimum of the following:

1 mm^2 2 core silicone insulated, aluminium foil screen, fire resistant cabling being either BS 6387: 3h @ 950 °C or
IEC 60331: 3h @ 750 °C

All conduit runs as required to accommodate the different cable runs, as indicated on the drawings, not cast into the concrete structure, shall form part of this contract. Conduits shall be 25 mm diameter, PVC. As this is an office environment, the conduits are accepted as being PVC.

14 FIRE GRAPHIC DISPLAY

The fire panel as well as the evacuation system shall be connected to a graphic display via a

suitable computer with a screen of minimum 55”. The latest version of Windows shall be

Installed as the operating system.

The programme shall be such that the detection and evacuation maps can be recalled onto the display at random. In the event of a fire condition, the block plan where the alarm condition is active, shall automatically display, and a button to activate the evacuation in the zone shall illuminate on the display.

15 OPERATOR AND MAINTENANCE MANUALS

15.1 LOGBOOK

A logbook in a wall mounted holder shall be provided and installed adjacent to the main fire panel for recording all system alarms and events.

15.2 DOCUMENTATION

Documentation shall form an integral part of this contract. Final payments will not be issued until full documentation to the engineer's satisfaction is received.

Upon completion of the installation, three (3) Operator's and Maintenance Instruction Manuals must be supplied. One copy of the entire manual shall be supplied in electronic format.

The following information must be contained in the documentation.

a) name of owner and occupant

b) location of building in which hazard is located

c) category of system installed

d) equipment schedule or bill of materials for each piece of equipment or device, showing device name, manufacturer, model or part number, quantity, and description

e) operator’s instruction of fire panel

f) installation instruction of fire panel

g) certificate of design

h) certificate of installation

i) certificate of commissioning

k) print out of panel devices

15.3 DRAWINGS

Provision of drawings shall form part of this project.

The following is to be supplied on completion of the project:

(a) System schematic

(b) Site plan of line device layouts and cable routes.

16 WORKS BY OTHERS

16.1 Electrical isolators to fire panels to be provided by client unless agreed otherwise.

17 ACCEPTANCE TESTS

17.1 Performance tests to determine and confirm that all equipment and components, as installed, comply with the specification, and meet the specified performance shall be conducted by the contractor.

17.2 Acceptance tests must be witnessed by the client's engineer.

17.3 An installation and commissioning certificate shall be signed and supplied by the contractor to the client.

18 TRAINING

The contractor shall allow for a half day training session with the client for operation of the system and demonstrate how to perform first line maintenance on the system.

19 GUARANTEE

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least 12 months from the date of acceptance by the Engineer.

20 FINAL INSPECTION

At the final inspection a trained representative of the Sub-contractor shall perform the tests. In addition, the representative shall demonstrate that the systems function properly in every respect. The demonstration shall be made in the presence of the engineer and duly designated representative of the client.