

PART 5

FIRE DETECTION AND EVACUATION INSTALLATIONS

The Fire Detection and Evacuation Installations for the project consist of the following:

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SCHEDULE OF DRAWINGS

The Schedule of Drawings for the Fire Detection and Evacuation Installations are as follows:

PEFD 231 – ESP1	- Site Plan Layout Drawing
PEFD 231 – FD&E1	- Parking Level Level - FIRE & EVACUATION LAYOUT
PEFD 231 –FD&E2	- Ground Floor Level - FIRE & EVACUATION LAYOUT
PEFD 231 – FD&E3	- First Floor Level -FIRE & EVACUATION LAYOUT

PART 5A : DESCRIPTION OF THE WORKS

FIRE DETECTION AND EVACUATION INSTALLATIONS

5.1 GENERAL INFORMATION

The Contractor must take into account all the information described in the preliminary documentation

The Documentation describes the Existing/Original Installations for the service, in order to identify exactly and currently on site. The additions for the existing will have to be incorporated as an integral part of the existing installations.

The Bills of Quantities to allow for the additions for the New Psychiatric Building and Incorporation of the additions into the existing Fire and Detection installations

5.2 FIRE FIGHTING

Generally the installation specified is to assist as an early detection system with communication assistance, in order to cause an alert for the due evacuation of people, and to initiate early reaction in order to minimise injury and damage as a result of fire.

The Existing Detection System is automatically link the local fire fighting unit in Port Shepstone to engage their assistance for fire fighting.

The link consists of a Radio Communication Device installed at the Hospital, all as part of the Fire Detection System.

5.3 SCOPE OF THE CONTRACT

The Scope of the Contract is to provide a comprehensive Fire Management System for the New Psychiatric Ward Building proposed at the Hospital. Refer to the Detail Layout Drawings issued for the Fire Detection and Evacuation Installations

The Contract is to include the supply, delivery to site, installation, testing, commissioning and handing over in good working order, train personnel, provide guarantees for a Fire Detection and Evacuation System.

The System to be integrated into the existing Control Panel installed in the existing Reception Area situated at the entrance to the Hospital.

The system is to consist of Fire Detection, Evacuation, Fire Telephones and communication installations as follows:

* **Fire Detection Installation**

The Fire Detection Installation will consist of fire detecting devices in buildings, including manual activating stations, audible alarms controlled from Fire Repeater Stations - all connected to the Main Fire Detection Control Panel to be situated in the Security Office, first floor.

The entire installation shall be analogue addressable.

* **Fire Evacuation Telephones**

The Fire Evacuation Installation shall consist of the provision of strategically positioned Fire Phone Handsets, connected to the Main Fire Control Telephone in the Security Office.

* **Microphone / Speaker**

The Microphone / Speaker Communication Installation shall consist of the general Microphone Sets installed adjacent to Fire Phone Sets in the various zones, and connected to dedicated speaker systems.

5.4 GENERAL CONDITIONS

The Detail Project Specification shall take preference over and above any other part of this documentation.

If any difference or contradictions are expressed as part of the documentation then at all times the Detail Specification shall take preference.

Due to the diverse nature of equipment on offer, the tender documentation will at all times be taken as the basis of the acceptable intended contract installation.

It must be noted that the documentation includes Bills of Quantities and that the descriptions of items for the supply and installation in these bills are in a concise and summary format only. Refer to the Detail Specification therefore for full descriptions, extent and detail.

5.5 EXTENT OF WORK

The extent of the work includes the supply and installation of all equipment, ancillary items, software and sundries necessary for the proper completion of the installation, although not specifically mentioned or specified, encompassing: for the New Psychiatric Ward Building

- 5.5.1** The supply and installation of all cabling, wiring, connectors, distribution frames, mounting brackets, etc., and all the equipment required by the Contractor to install a complete and neat workable installation, including all conduiting, outlet boxes, and sleeves indicated on the relevant drawings.
- 5.5.2** The supply and installation of fire resistant 2-core Armoured Power cable medium (PH120) in a loop formation on external cable tray and/or conduit run for connecting the Main Fire Control Panel (MFCP).
- 5.5.3** The supply and installation of a central fire detection control panel (addressable analogue type) already has been installed and the New Installations are limited to the installations Specified for the Psychiatric Ward Building, all connected to the relevant resettable manually operated alarm units, ionization smoke detectors, optical smoke detectors, heat detectors, buzzers, sirens, mounted over the flush wall/ ceiling mounted termination boxes.
- 5.5.4** Graphic Annunciators Panels (GA) to be installed in the Security Office on First Floor and the Security Guard Office. The two GA Panels will have to be updated to include the New Psychiatric Ward Building.
- 5.5.5** The supply and installation of Remote Illuminating Block Diagrams for the individual zones mounted against the walls as indicated on the drawings.
- 5.5.6** The supply and installation of a Fire Telephone System and Microphone /Speaker System including Sub Fire Station Zone Enclosures & Speakers, all connected to the existing Reception Area.
- 5.5.7** The supply and installation of suitable fire rated enclosures for the connection of cables to the separate zones.
- 5.5.8** The supply and installation of a fire resistant 2-core transmission medium (PH120) connected to the detectors, resettable manual alarm units, isolators and sounders, enabling the pre-fire alarm and buzzer signal.
- 5.5.9** The supply and installation of fire resistant 2-core transmission medium (PH120) connected to the air conditioning units, enabling the cut-off of air conditioning units and extraction fans. Refer specifically to Detail requirements on Drawing SL 231-EPM
- 5.5.10** The supply and installation of an automatic telephone caller (dialling device).

- 5.5.11** The supply and installation of ionization, optical and heat smoke detectors, manual operated resettable fire alarm unit, buzzers and sirens, as indicated on the drawings.
- 5.5.12** Complete Computer installation including software compatible with existing. (depending on the equipment offered).
- 5.5.13** The new installations to be compatible with the Existing Printer used in conjunction with the fire detection control panel.
- 5.5.14** The supply, installation and cabling of the UPS power supplies to all the equipment supplied under this contract.
- 5.5.15** The testing, commissioning and handing over of all the systems that form part of the contract.

5.6 GENERAL REQUIREMENTS

Tenderers shall supply full detail of the equipment offered at tender stage and shall make full allowance for the design, supply, wiring, installation and commissioning of the total system.

Approval of the equipment shall only be considered after samples have been approved and/or a working installation inspected. The cost of this inspection shall be for the Contractors account.

All the control equipment for the Fire Detection and Evacuation systems shall be installed where indicated on the drawings with alarms where indicated.

For calculating his tender price the tenderer must take the following into consideration.

- (a) It is essential that a layout showing the equipment positions and any changes that the Contractor requires, shall be submitted for approval within two weeks after the tender has been awarded so as to ensure that the conduit system provided is to the Fire Detection Specialists specification.
- (b) Changes at a later stage required by the Contractor, due to bad planning at this point in the programme, shall be for his own account.
- (c) The conduit and channel systems will be provided under this contract and the onus is on the Contractor to ensure that the conduit is installed to specific requirements, regarding position of outlets and size of conduits, sleeves, distribution boxes, etc. However, the quality of the conduit installation will be installed to the full satisfaction of the Engineer.

Supply and installation of the complete fire detection system to comply with the current applicable provisions of the following standards:

- (a) SANS 10142-1
- (b) National fire protection standards:
 - NFPA 71 : Central station signalling systems - protected premises unit
 - NFPA 72A : Local protective signalling systems
 - NFPA 72D : Proprietary protective signalling systems - protected premises unit
 - NFPA 72 E : Automatic fire detectors
 - NFPA 101 : Life Safety Code
- (c) National Building Regulations
 - SANS 10400 : Application of the NBR
- (d) All requirements of the local authority
- (e) The system and all components shall be listed by SANS Codes. For use in fire protective alarm systems under the following standards as applicable:
 - SANS 10139 : Fire Alarm Systems, detection, buildings, design, installation, servicing
 - SANS 60331-11 : Fire Conditions, electric cables, circuit integrity.
 - SANS 50054-2 : Control units for fire protective alarm systems
 - SANS 50054-7 : Smoke detectors - light, for fire protective alarm systems
 - SANS 50054-5 : Heat detectors for fire protective alarm systems
 - SANS 50054-1 : Automatic components for fire protective alarm systems
 - SANS 50054-3 : Audible sound devices for fire protective alarm systems
 - SANS 50054-11 : Manual Call Points for fire protective alarm systems
 - SANS 50054-4 : Power supplies for fire protective alarm systems.

- (f) SANS 9000, SANS 9000-1 and SANS 9001
- (g) National Electrical codes as specified.

5.7 WORK DRAWINGS AND TECHNICAL INFORMATION

5.7.1 General

The position of the main equipment and devices have been shown on the drawings and provisional conduit runs, wiring or cabling between equipment has been shown.

It shall be the responsibility of the Contractor to ensure that the method of installing wiring or cabling and the wiring used between the equipment shall be as indicated. Any variations in order to accommodate the system offered or to improve must be indicated before and installation work has been commenced with on site.

5.7.2 Submittals as Part of Tender Documentation

The name, address and contact details of the specialist to be used to supply and install the Fire Detection and Evacuation Installation to be included on the schedule to be provided as part of the tender documentation..

5.7.3 Specification Compliance

5.7.3.1 Certification of SANS 9000, SANS 9000-1 and SANS 9001 compliance for the manufacturing, design and installation of the product should be included.

5.7.3.2 Before commencement of installation, the Contractor shall submit complete documentation showing the type, size, rate, style, catalogue number, manufacturers names, photos and/or catalogue data sheets for all items offered enabling the Engineer to ensure compliance of the equipment with this specification.

This information shall be submitted to the Engineer within fourteen (14) calendar days after an award of this contract and shall be subject to his comments.

The onus lies with the Contractor to ensure that the equipment ordered, complies to the specification.

Furthermore, the Contractor shall submit for inspection & permission to proceed with the complete layout of the entire system, showing wiring and all equipment, prior to manufacture.

All equipment proposed as equal to that specified herein, shall conform to the standards specified.

5.7.4 Submittals on Completion of the Installation

Detail As-Built transparent drawings and a copy on a Flash Drive of each part of the complete installation shall be submitted to the Engineer on completion of the installation. The Flash Drive copy shall be a standard CAD drawing down-loaded to DXF format.

Such detail drawings shall include complete and fully dimensional drawings of the equipment, full schematic diagrams of all circuits, terminal numbers, resistance values, capacities of all equipment, supply voltages, component characteristics and values, block diagrams and line diagrams, etc.

Three user manuals as specified in this specification, bound in hard cover ringbinders, shall be submitted to the Engineer on completion of the installation.

5.8 ENVIRONMENTAL CONDITIONS

5.8.1 Altitude

Sea level.

5.8.2 Climate

Sub Tropical

5.9 SUPPLY VOLTAGE

The low voltage power distribution system in both buildings will be a 400/230 Volt \pm 10%, 3-phase, 4-wire, 50 Hz AC supply.

5.10 EQUIPMENT OFFERED

All the equipment offered shall be able to function at this voltage and at the above tolerance.

All the equipment associated with the system shall be able to operate from the low voltage power distribution system for twenty-four hours per day without overheating or degradation.

The equipment offered shall also function normally from the Standby Generator Set and UPS equipment under Essential Supply Conditions.

5.11 PROJECT MANAGEMENT

The Contractor shall provide:

- (a) The provision of a full time project manager for the management of employees during the complete installation, implementation and training period.
- (b) The provision of a full time competent project foreman, agent or charge hand appointed to superintend operations on site.
- (c) Supervision over the implementation of the systems.
- (d) Daily on site support until the system is operating effectively.
- (e) Arrangements for and the training of the Administrations staff.

5.12 QUALITY CONTROL OF MATERIAL

All materials shall be the best of their respective kinds described in the specification and shall in every way be suitable for the purpose for which they are intended to be used.

All materials and equipment supplied shall fully comply to the requirements laid down in this specification and the latest editions of the relevant **SANS, BS, ASA, NEMA, IEEE, CCITT, EIA, ISO and DIN** specifications as specified elsewhere or as otherwise specified.

Any item not complying with the following shall be substituted with an approved new component at no cost to the Administration, the acceptance or rejection of such work being determined by the Administrations representative.

The Contractor shall maintain adequate and effective quality control standards while manufacturing or installing of the specified equipment.

The Administrations representative shall have the prerogative of inspecting the equipment in the Contractors factory or on site, or to call for manufacturers test certificates of such equipment at any reasonable time. The Administrations representative shall ensure accuracy of dimensions, completeness, configuration, quality of workmanship, correct identification, proper use of and type of materials, equipment used and finishes to equipment.

In the event that it is not possible to submit an actual sample then full details, supported by accompanying literature and/or photographic information is to be submitted, all prior to procurement and installation on site.

The above shall not relieve the Contractor of his responsibility for design, detail and dimension and shall in no way exonerate him from his liability to carry out the work in accordance with the terms of the contract and specification.

All such samples may be retained until completion of the contract. All such samples must have labels securely attached thereto designating the contract by name and number, the name of the Contractor and any further relevant information.

5.13 WORKMANSHIP

The Contractor shall only employ competent Engineers, Technicians and Artisans to erect the installation on site.

The contract shall be executed with the best workmanship in a workmanlike manner to the satisfaction of the Administrations representative.

The Contractor must maintain a high quality of workmanship and the Engineer shall be the sole arbiter, determining whether the installation or individual portions thereof are acceptable or not.

The Contractor shall be informed in writing should the equipment or workmanship not be to the satisfaction of the Engineer and thus not acceptable. In such a case the Contractor shall replace the equipment and/or perform the remedial work immediately at the cost of the Contractor. All rejected material shall be removed from site.

The Engineer may upon request of the Contractor visit existing installations or prototype assemblies in the factory to determine that the workmanship is of the required standard.

5.14 COMPETENCY OF WORKMEN

The Administration/ Representative reserves the right to call upon the Contractor to remove any workman or representative who, in their opinion, is incompetent or whose presence would have a deleterious effect on the progress of the works.

5.15 TRAINING

5.15.1 Training of Operators

A suitable qualified person, preferably one who has been involved with a similar installation, or the installation on site and who is conversant with the English/Afrikaans/Zulu/Xhosa languages shall train and instruct operators employed by the Administration in operating the installation.

Such a person shall be available to instruct and train the persons involved by means of lectures and practical instructions on site for a period of one day minimum, commencing two days before the commissioning and handing over of the installation.

The Contractor shall supply full details of the proposed training to be given on all hardware and software as specified in this specification and detailed in the bills of quantities.

He shall also indicate the duration of the course and course outline.

The training cost shall cover training for the supervisor responsible for the telephones, the telephonists (allow for three individuals) a personal representative of the Security Department and 2 additional persons - all at the Hospital.

The Contractor shall assist the trainees on any problems and questions asked by them during the one year guarantee period. This will include additional software support, etc.

5.15.2 Training of Technical Personnel

A suitable qualified person, preferably one who has been involved with a similar installation, or the installation on site and who is conversant with the English and relevant local language, shall train and instruct technical personnel employed by the Administration in maintaining the functionality of the installation at the end of the guarantee period. The trainee shall be able to operate the plant without any difficulties, even in emergency situations after the training period.

Such a person shall be available to instruct and train the persons involved by means of lectures and practical instructions on site with regards to operation, routine maintenance and inspection of the installation for a period of one day minimum, commencing two days before the commissioning and handing over of the installation.

Irrespective of the above, the Contractor shall perform revision training of the technical personnel six months after acceptance of the installation and the first training session. The Contractor shall determine whether the personnel is familiar with and adequately trained to utilize the installation fully and submit a report after this revision training to the Administrations representative.

The Contractor shall supply full details of the proposed technical training to be given on all hardware detailed in the bills of quantities.

He shall indicate the duration of the course and course outline.

The training cost shall cover training of approximately 7 persons at the Hospital.

The technical and operational manuals to be supplied by the Contractor must be explained fully to the personnel.

If any questions or problems are experienced relevant to the technical side of the installation, the Contractor shall assist in sorting out the problem to ensure a working installation, including the providing of additional software support, etc.

The Contractor shall provide to the Department confirmation of the Training Programme, listing the personnel that received training, the duration of training, a brief description of the programme and finally a certificate signed and dated by the Supervisors of the relative departments and institutions. Training of personnel shall include actual representation of the Security Department, Maintenance, Workshops and the applicable Administration staff personnel.

5.16 FIRE BRIGADE

A direct communication link for connection to the Fire Brigade via a VHF Radio shall be provided.

5.17 COMPLETION CERTIFICATE

A Completion Certificate is to be issued to the Consulting Engineers confirming that the installation has been completed and a Declaration to this affect.

The certification shall be on an official company letterhead signed and dated by the responsible person appointed by the firm responsible for the supply and installation of the Fire Detection and Evacuation and the date of completion respectively.