PROPOSED NEW POLICE STATION FOR SOUTH AFRICAN POLICE SERVICES (SAPS) - PORTION 4 OF ERF 6934 IKAGENG EXT.4

SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF FIRE DETECTION INSTALLATION

PROPOSED NEW POLICE STATION FOR SOUTH AFRICAN POLICE SERVICES (SAPS) - PORTION 4 OF ERF 6934 IKAGENG EXT.4

FIRE DETECTION INSTALLATION

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PART 1

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PART 1

PROPOSED NEW POLICE STATION FOR SOUTH AFRICAN POLICE SERVICES (SAPS) - PORTION 4 OF ERF 6934 IKAGENG EXT.4

FIRE DETECTION SPECIFICATION

TECHNICAL SPECIFICATION

1. GENERAL

The work shall be carried out strictly in accordance with:

- The Occupational Health and Safety Act, Act 85/1993
- SANS 10400-T:2020 Fire Protection
- SANS 10139: 2021 Fire detection and alarm systems for buildings - System design, installation and servicing
- SANS 7240-16: Fire detection and alarm systems – Part 16 Sound System Control and Indicating Equipment
- SANS 7240-19: Fire detection and alarm systems – Part 19 Design, Installation, Commissioning and Service of Sound Systems for Emergency Purposes
- SANS 7240-24: Fire detection and alarm systems – Part 24 Sound-system loudspeakers
- SANS10400-A General Principles and Requirements
- SANS 10140-3: 2017 Identification colour markings Part 3: Contents of pipelines
- SANS 543:2019 Fire hose reels (with semi-rigid hose)
- SANS 1086:2015 Flexible poly(vinyl chloride) (PVC) pressure hose
- SANS 10087-1:2013 The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations Part 1: Liquefied petroleum gas installations involving gas storage containers of individual water capacity not exceeding 500 L and a combined water capacity not exceeding 3 000 L per installation
- BS EN 12101-Part 5 - Smoke and Heat Control systems
- Local Municipality Emergency Services By-Laws

All tests shall be to the satisfaction of the Consulting Engineer or his representative who shall have the right to inspect the installation at all reasonable hours during the progress of the works.

2. THE PROJECT

The project shall consist of the supply installation, testing, commissioning and 12 months guarantee (with free maintenance during the guarantee period) of the proposed new police station for South African Police Services (SAPS) - portion 4 of erf 6934 Ikageng ext.4: fire installation.

The fire design shall include the installation of SABS approved following firefighting equipment;

- Fire Detection (Manual Type System) for the Police Station

Miscellaneous

The fire subcontractor shall;

Supply 3 sets of as-build drawings and operating and maintenance manuals upon completion of contract, complete with CAD drawings on compact disk

Provide 12 months maintenance with guarantee

Attend site meetings as required

3. GUARANTEED PERFORMANCE

The system and individual items of the system shall be guaranteed by the Contractor to operate efficiently.

It is the Contractor’s responsibility to establish, to the Engineer’s satisfaction, that the installation performs as specified.

If at any time during the tender period or course of the contract the Contractor has any doubt about the specified installation he must check and if necessary contact the Engineers in order to satisfy himself.

4. CO-ORDINATION

The Contractor shall be responsible for the co-ordination of his own work, and is to be mindful of co-ordination with all other services as regards both physical clashes and installation programme. Ass potential clashes shall be brought to the Engineers attention for addressing should this have significant design implications.

5. EMPLOYER TRAINING

A representative of the Contractor shall be available to instruct the proprietor's building maintenance staff (or his appointed representative) in the operation of his system, and to ensure that such persons are fully conversant with the control and operation of the system.

This instruction exercise is to take place prior to the system being left operational. The Engineers are to be informed in writing as to when this instruction period is scheduled to commence. On the completion of this exercise the contractor is to obtain the Proprietor's representative's formal acceptance of this hand-over tuition, thus acknowledging his complete understanding of the operation procedure for this installation.

6. AS-BUILT DRAWINGS

The contactor is responsible for the production of as-built drawings, and for the issue of one plastic copy of each drawing to the Proprietor's maintenance engineer. A further 3 paper print copies are required, these forming an integral part of his Maintenance Manuals.

These drawings are to illustrate any changes in the pipe routes and sprinkler heads. The as-built drawings are to include for a process flow diagram, pump/tank room layout and the piping layouts.

7. OPERATING AND MAINTENANCE MANUALS

7.1 General

Operating and Maintenance (O&M) manuals shall be prepared in accordance with the following guidelines. Changes to format may be required but these will be timeously advised by the Engineer.

The Contractor shall prepare a draft copy of the O&M manual and submit to the Engineer at least two month prior to the commencement of dry-commissioning. The Engineer shall solicit comments from Umgeni Water on the draft copy and furnish the Contractor with these comments within 30 days of receipt of the draft. The contractor shall then incorporate all comments and complete the O&M manuals as specified.

Provision of all five (5) sets of O&M manuals as specified is inter alia a pre-requisite for Practical Completion of the Works and Retention Moni
es will not be released until they are in hand.

Preparation Of The Manual

The manuals shall be prepared within the contract, and shall be particular to the project. All charges that may be required by manufacturer's suppliers for the provision of information and literature shall be included in the contract price and the entire cost of producing and providing the O & M manuals shall be to the Contractors' account.

The manual shall be arranged with an index and referencing system. A matching flysheet will give the names and addresses of the principals involved on the project.

The covers shall be hard bound with a four-post loose-leaf system. The contract details shall be embossed on the front cover. Numbered card dividers shall be inserted between the sections.

The completed set of manuals shall be provided to the Engineers at practical completion.

Contents Of Operating And Maintenance Manual

The format of the manual shall be in accordance with the following sections, after a preface and index.

Section 1:

This shall comprise the introduction, abbreviations, and any warnings that may be required by the Machinery and Occupational Safety Act, Local Authorities and other such bodies.

Section 2:
A full description of each system, together with the main plant components and locations, plus the mode of operation of automatic control systems associated with such system shall be reflected in this section.

Section 3
This shall comprise the complete plant technical data of each item of equipment (e.g. manufacturers name and address, type and size of unit, serial number, bearing pulley and belt details, motor details, unit performance and

duty details). This information shall be derived from a site inspection of identification plates together with information obtained from manufacturers.

Section 4:
This section shall describe in detail the operating procedures necessary for starting up, running and shutting down each individual system. This shall include the control panel starter and selection facilities together with any alarm and safety interlocks as identified on the control panels.

Section 5:
This shall comprise the maintenance operations on a daily, weekly, monthly etc basis for each item of plant. The preparation of this section shall be carried out by obtaining from the manufacturer his advice and recommendations for lubrication, adjustment and routine maintenance.

Section 6:
This section shall comprise the emergency procedures to be adopted by personnel engaged on the operation and maintenance of the mechanical and electrical services, with respect to fire, first aid, general failures to water and electrical systems, gas lines, chiller refrigerant pipework, and call-out procedures for maintenance personnel in working hours and out of working hours.

Section 7:
A recommended action on plant malfunction shall be detailed in this section. This is to assist both the user and maintenance engineer in the event of a fault developing in a system by indicating the nature of the fault and the recommended action.

Section 8:
This shall comprise a list of recommended spares and lubricants. The preparation of this section shall be carried out by obtaining the manufacturers recommendations and also incorporate the Clients requirements regarding spares.

Section 9:
A schedule of the record or as-built drawings together with reduced copies (A4 size) of the record drawings will be inserted in numerical order in this section.

Section 10:
This section shall comprise test certificates and commissioning reports. It shall also contain copies of fan and pump curves with the duty points clearly indicated.

Section 11:
This shall comprise the manufacturers' literature, arranged in alphabetical order to match the manufacturers list. It shall also give the manufacturers (or their local representatives) names, addresses and telephone numbers

8. MAINTENANCE

The Contractor shall be responsible for maintaining the installation during the initial 12 months of operating of the plant. Unless otherwise specified this shall require service visits not less than 3 months apart. The costs of the initial 12 months maintenance shall be built into the contract price, but will exclude the costs of expendables.

The Contractor is to negotiate and formalise a Maintenance Contract Agreement at least 3 months prior to the expiry of the free maintenance period

Maintenance Contract

Immediately following the service at the middle of the guarantee period, the Contractor is to submit a draft Maintenance Contract Agreement to the client, through the Engineers, in order that a maintenance contract (between Client and Contractor) can be formalised well in advance of the expiry date of the guarantee period. This draft agreement is to fully detail the work intended to be carried out under this contract.

9. TESTING

TESTS TO BE PERFORMED

- Final testing to be done in the presence of Fire Engineer. Contractor to make themselves available for final testing on two separate days, one in the presence of the fire consultant only and the other in the presence of the fire inspector and fire consultant combined.
- COC to be provided upon successful completion of testing

10. COMMISIONING PROGRAMME

The fire detection contractor shall adhere to the Principal Contractor's building programme for the installation. He shall be responsible for negotiating with the Principal Contractor for this programme to be drawn up or adjusted

to allow for sufficient time for the installation and testing of the fire systems to ensure that his commissioning programme meets the following requirements:

Scheduled Contract Completion Date: To be Confirmed

Beneficial occupation: To be Confirmed

11. NON PRODUCTION OF AUXILIARY ITEMS OF THE INSTALLATION

The specification calls for the Contractor to furnish certain auxiliary items as part of his overall installation. Examples of such items are:

- The Operating and Maintenance Manuals.
- The Production of as-built drawings, including computer discs.
- The Production, framing and fixing of switchboard diagrams, schematics, simplified operating instructions etc.
- The instruction of the Employer's staff in the operation and routine maintenance of the works.

Should the Contractor fail to meet these requirements, monies will be withheld against the specific items at a value estimated by the Consulting Engineer. This estimate will be based on what it could cost the Engineer to undertake the task on behalf of the Contractor.

12. STANDARDISATION OF EQUIPMENT

Equipment shall be made by one manufacturer when practicable. The Contractor shall not use items of different manufacture or type to perform the same function in different parts of the installation.

13. VALUE ADDED TAX

Allowance must be made for the Value Added Tax at the rate applicable at the date of tender for all items reflected in the Price Schedule.

14. CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS

Should the contractor note an inconsistency between the Specification and drawings he shall be responsible for notifying the Engineer and obtaining clarification or instructions prior to ordering or installing equipment.

15. DEFINITIONS

Supply	: To purchase or procure and deliver complete with all necessary and additional specified accessories
Erect	: To place or mount and fix in position
Install	: To erect, connect up and commission, complete with related accessories
Indicated, Shown, Noted	: As indicate or shown on drawings
Or Equal Approved	: Equal or better in efficiency or performance and Compatibility with installation

16. INSPECTION OF THE WORKS

The Tenderer shall take every opportunity to familiarize himself with the existing conditions, tie in points etc, and how they will affect the proposed building works. No extra payment will be allowed for any conditions, which may arise due to the Tenderers lack of knowledge of conditions

17. CO-ORDINATION WITH OTHER SERVICES

Careful co-ordination of the Fixed Fire Systems with other services is required. Tenderers must make allowance for adjustments to be made on site to avoid clashes with other services, as no extra payment will be allowed for this.

18. DESIGN OF LAYOUTS

Tenderers shall submit workshop drawings to the Client or his agent for approval before commencement of the works. No extra payment will be made for any drawing or redrawing by the successful tenderer. Allowance must be made for this in the tender price.

19. PRICING OF THE WORKS

Rates in the Tender Price Schedule shall be fully inclusive of all Preliminary & General items, design work, drawings, fabrication, piping, fittings, hangers, galvanizing, painting and accessories. Adjustments to the Tender Price will only be made for additional elements listed in the Tender Price Schedule at the tendered rates. No re-measurement of piping or fittings will be allowed. No variation orders shall be permitted for changes to piping or fittings due to adjustment of head positions, or co-ordination with structure or other services. Tender rates shall be deemed to include sufficient allowance for this.

Tenderers shall be required to submit the breakdown of the Tender Price Schedule, with their tender. The onus shall be on the Tenderer to ensure that the quantities and calculations provided by him are correct.

20. COMPLIANCE WITH REGULATIONS

The entire installation under this contract shall comply in all respects with Regulations set out in the current editions of the publications listed in sub-section 1, together with special requirements as described in these Specification

21. QUALITY OF WORK

The client or his agent shall have the right to visit the site at any reasonable time and inspect the progress of the work and materials used, and shall have the right to reject:

- Any work which in his opinion is not to specification or standard, and which is badly or incorrectly carried out.
- Any materials which are considered not to specification or are of an inferior quality. Only new materials shall be used.

For the full duration of the Contract, the work shall be carried out under the supervision of a skilled representative of the Contractor, who shall be able to receive and carry out instructions on his behalf. A sufficient number of workmen shall be employed at all times to ensure such progress as is commensurate with the progress of the construction work.

22. BUILDERS WORKS

Unless otherwise specified, all builders' work shall be excluded in this Contract.

23. SCAFFOLDING

Scaffolding shall be supplied by the Contractor, and shall in all respects meet the requirements of the Occupational Health and Safety Act.

24. CLEAR AWAY RUBBISH AND MATERIALS

All rubbish accumulated during the works and all superfluous materials not required for the completion of the Contract shall be removed from site by the Contractor on an ongoing basis, as directed by the Client or his Agent.

25. LIAISON WITH OTHER CONTRACTORS

The Contractor shall be required to carry out the works in close collaboration with other contractors. The Contractor shall liase fully with other contractors, and shall co-operate to the fullest extent with all parties involved in the project.

26. PROGRAMME

The successful Tenderer will be required to submit a provisional programme within 2 weeks of being awarded the contract. This programme will show all activities anticipated for the completion of the works, including lead times on any Specialised Equipment.

27. FIRE DETECTION

The purpose of the fire detection system is to provide the building with measures to warn occupants that there is a fire and to shut off equipment, alert the relevant authorities and activate and shut down systems as required. The system is also to allow for the escape of all persons from the building safely and quickly.

This specification covers the design verification, supply, delivery, installation, testing, commissioning and handing over of the complete Fire detection system specified below and as indicated on the drawings, which form part of this specification. All the work shall be carried out to the complete satisfaction of the Client and Consulting Engineer.

The drawings indicate the proposed system and locations of equipment. The Supplier is to verify the design to ensure compliance with the relevant regulations. Any and all potential non-compliance should be sent to the Engineer.

All equipment, cabling etc., or any materials used shall be new, suitable for the said operating requirements.

Principal items of work

Principal items of work include, but are not limited to, the supply and installation of the following equipment only where applicable:

- Fire Detections systems
- Fire detection control panel
- Fire detection repeater panel
- Heat Detectors
- Smoke Detectors
- Manual call points
- Siren/strobe combinations
- Cabling
- Containment
- Powder coating of containment
- All necessary supports, hangers, brackets and accessories to complete the installations.
- Commissioning and testing of the installations.
- Provision of maintenance for 12 months after the main contract works completion and final handing over of the entire building to the client.
- Appointed contractor to have valid SAQCC certification.

Design Parameters

Fire Detection installation will comply with all the requirements of the following:

- SANS 10400: T
- SANS 10139
- All other relevant guides and building regulations

General System Requirements

The facility shall be equipped with an early warning detection and alarm installation, in accordance with the relevant South African National Standards documentation, comprising of:

- A manual type fire detection system for the building

All fire related conduit / cable tray / trunking shall be galvanized yellow powder-coated, including bushes, locknuts, couplings, galvanized saddles, etc.

General Equipment Requirements

Manual call points should comply with the requirements of SANS 50054-11 for Type A ("single action") manual call points, will be installed at every exit from the building and at every entrance into an emergency route as well as in all stairwells at every level.

Point heat detectors should comply with the requirements of SANS 50054-5 for Class A1 or A2 detectors, unless the foreseeable maximum ambient temperature in the protected area is 40 °C or above, in which case a Class B-G detector should be used as appropriate (see clause 9)

Point smoke detectors should comply with SANS 50054-7

Flame detectors should comply with SANS 50054-10

Any restrictions in the use of the detectors declared by the manufacturers should be taken into account in the system design.

Control and indicating equipment should comply with SANS 50054-2

Audible fire alarm devices should comply with SANS 50054-3 and the measured sound pressure level at any point within the building should be 65dB(A) or 5dB(A) louder in any area where the background noise if 61dB(A) or greater.

Power supply equipment should comply with SANS 50054-4

Cables should comply with the recommendations within SANS 10139

Those functions of the system that are recommended in this standard, for which the storage of programs and data is necessary to control the fire detection and alarm system, should comply with the additional design requirements for software controlled control and indicating equipment in SANS 50054-2

Cabling

The electrical characteristics of all cables, such as voltage drop for the extra low voltage supply from an external power supply text, current carrying capacity, impedance and, where appropriate, ability to transmit data, should be suitable for the system.

Cabling will generally be enhanced fire resisting cables should meet the PH 120 classification when tested in accordance with SANS 50200 and the 120 min survival time when tested in accordance with BS 8434-2.

Cables should be installed without external joints wherever practicable. All terminations and other accessories should be such as to minimize the probability of early failure in the event of fire. Other than in the case of joints at or within system components such as control equipment, manual call points, fire detectors and sounders, terminals used to joint cables should be constructed of materials that will withstand a similar temperature and duration to that of the cable. All joints, other than those within system components, should be enclosed within junction boxes, labelled with the words "FIRE ALARM" to avoid confusion with other services.

All conductors should have a cross-sectional area of at least 1 mm^2 .

All fire alarm cables should be red in colour, to enable these cables to be distinguished from those of other circuits.

All fire alarm cable outer sheaths should be marked in order to identify the cables. Markings should include the following:

- the manufactures name, trade name or trademark;
- the year of manufacture;
- the cable description;
- the fire rating of the cable along with the test method used; and
- the batch number.

Markings should be legible and be 550 mm apart. Characters of maximum height 13 mm, and minimum height, 3 mm. Smaller characters may be used where cable diameters are less than 6 mm.

Containment

Methods of cable support should be non-combustible and such that circuit integrity will not be reduced below that afforded by the cable used, and should withstand a similar temperature and duration to that of the cable, while maintaining adequate support.

To avoid the risk of mechanical damage to fire alarm cables, they should not be installed within the same conduit as the cables of other services. Where fire alarm cables share common trunking, a compartment of the trunking, separated from other compartments by a strong, rigid and continuous partition, should be reserved solely for fire alarm cables.

General Installation

The entire system should comply with the requirements of SANS 10142-1. In general, the recommendations of this standard supplement, but do not conflict with, these requirements. Where any such conflict is considered to exist, the recommendations of SANS 10142-1 should take precedence.

Cables which are directly fixed to surfaces should be neatly run and securely fixed at suitable intervals, in accordance with the recommendations of the cable manufacturer. Cables should not rely on suspended ceilings for their support.

Where new conduit, trunking or tray is installed, its capacity should be in accordance with the recommendations given in SANS 10142-1.

Where a cable passes through an external wall, it should be contained in a smooth-bore sleeve of metal or other non-hygroscopic material sealed into the wall. This sleeve should slope downwards towards the outside and should be plugged with a suitable non-hardening waterproof compound to prevent the entry of rain, dust or vermin.

Where a cable passes through an internal wall, a small clearance hole should be provided. If additional mechanical protection is necessary, a smooth-bore sleeve should be sealed into the wall.

Care should be taken to ensure that the ends of any sleeves are free from sharp edges which might damage cables during installation.

Where cables, conduits, trunking or tray pass through floors, walls, partitions or ceilings, the surrounding hole should be as small as reasonably practicable and made good with fire stopping materials that ensure that the fire resistance of the construction is not materially reduced. Spaces through which fire or smoke could spread should not be left around the cable, conduit, trunking or tray.

If cables or conduits are installed in channels, ducts, trunking or shafts that pass through floors, walls, partitions or ceilings, barriers with the appropriate level of fire resistance should be provided within the channels etc. to prevent the spread of fire unless, in the case of ducts and shafts, the construction of the duct or shaft affords equivalent fire resistance to the structure penetrated; in the latter case fire stopping need only be provided where cables pass into, or out of, the duct or shaft.

Builders work

The Fire Detection Subcontractor shall be responsible for providing all small openings in brick walls for conduit etc. and for providing the necessary flashing, support brackets for cabling and containment.

Earthing and Bonding

All new metal systems shall be continuity bonded and tested to ensure earth continuity. These shall all be tied into the buildings main earthing system, whether it is rebar or other system being employed.

Carry out equipotential bonding and tests to prove the effectiveness of the earthing system. All tests shall be fully recorded and included within the operating and maintenance manuals.

Workmanship

Prevent entry of foreign matter into any part of system by sealing openings during construction. Fit all access covers and cleaning eyes as work proceeds.

Handle, store and securely fix all products and accessories in accordance with manufacturer's recommendations.

All equipment and fittings shall be properly cleaned, where necessary following completion of the installation.

Testing and Commissioning

Testing and commissioning shall be undertaken in-line with the CIBSE Commissioning codes as well as below. This is in-line with the Green Star Rating Specification.

The Fire Detection Subcontractor shall be responsible for testing and commissioning of the complete plant and allow for inspections by the Engineer as required.

After the Fire Detection Subcontractor has completed his testing and commissioning and is satisfied that the plant is ready for the Practical Completion Inspection he shall notify the Engineer so that the Practical Completion Inspection can be arranged.

Commissioning Schedule

The subcontractor shall submit to the engineer a complete commissioning schedule at least 1 month before commissioning commences. The commissioning schedule shall contain all commissioning activities, all equipment to be tested and all variables of all equipment to be checked.

General Recommendations

All installed cables with a manufacturer's voltage rating suitable for mains use should be subject to insulation testing at 500 V d.c. Prior to this test, cables should be disconnected from all equipment that could be damaged by the test.

Insulation resistance, measured in the above test, between conductors, between each conductor and earth, and between each conductor and any screen, should be, at least, 2 MΩ.

Earth continuity and, for mains supply circuits, earth fault loop impedance, should be tested to ensure compliance with SANS 10142-1.

Unless there is specific agreement that the following tests will form part of the commissioning process, the tests should be carried out on completion of the installation work:

- where maximum circuit resistance for any circuit is specified by the manufacturer or supplier, measurement of the resistance of every such circuit;
- any other tests specified by the manufacturer of the system;
- check correct polarity of circuits where this is required for correct monitoring (to ensure operation of any manual call point while all detectors on a circuit are removed).

Commissioning

At commissioning, the entire system should be inspected and tested to ensure that it operates satisfactorily and that, in particular:

- All manual call points and automatic fire detectors function correctly.
- If the specification requires labelling or other means of visual identification of manual call point automatic fire detectors, fire alarm devices or ancillary devices, this has been carried out.
- Every manual call point and automatic fire detector, on operation, results in the correct zone indication, and, in the case of addressable systems, correct text display, at all indicating equipment.
- Any facility for remote transmission of fire alarm signals (and, where appropriate, fault signals) to an alarm receiving centre operates correctly;
- Any "cause and effect" requirements of the designer (e.g. in respect of staged alarms or initiation of operation of other fire protection systems and equipment, and safety measures) are fully satisfied;
- All alarm, control, indicating, printing, and ancillary functions of the system operate correctly and are adequately labelled or identified;
- No changes to the building since the time of original design have compromised the compliance of the system with this standard (e.g. by erection of new partitioning that affects the adequacy of siting of fire detectors or the effectiveness of warning devices);
- A suitable zone plan is displayed
- Mains power supplies are inspected as far as is reasonably practical
- Standby power supplies comply and the system's actual load currents in all circumstances are close to the predictions used by the designer to determine the specified battery capacity;
- As far as it is reasonably practicable to ascertain, the specified cable type has been used in all parts of the system
- There are no other obvious shortcomings in compliance
- In radio-linked systems, radio signal strengths are adequate throughout all areas of the protected premises to ensure reliable operation of the system;
- Adequate records of insulation resistance, earth continuity and, where appropriate, earth loop impedance tests exist;
- All fault indicators and their circuits should be checked, where practicable, by simulation of faults conditions;
- All relevant documentation has been provided to the user or purchaser.

Labels, visible when batteries are in their normal position, should be fixed to batteries, indicating the date of installation.

On completion of the commissioning, a certificate signed by a competent person in accordance with the model given in G.3 of SANS 10139, should be issued.

Contractor General Requirements

Contractor Information, drawings and samples

The Fire Detection Subcontractor shall within a period of two weeks of receipt of documentation verifying his appointment submit to the Engineer all drawings and samples as requested by the Engineer. The drawings shall be submitted with reasonable promptness and in an orderly sequence so as to cause no delay to the works.

The Fire Detection Subcontractor shall be responsible for providing the following drawings pertaining to the Fire Protection Installation for the execution of the project.

- Fire Detection Sub-contractor's Drawings
- Builder's Work Drawings
- Shop Drawings

By preparation and submission of this information, the Fire Detection Subcontractor shall be deemed to have determined and verified all field dimensions, materials, catalogue numbers etc. In terms of the project programme, the Fire Detection Subcontractor shall allow the Engineers two calendar weeks for scrutiny of drawings.

The Fire Detection Subcontractor shall submit electronic copies of all drawings to the Engineer for approval before commencement of work.

No portion of the work requiring approval of shop drawings or samples shall be commenced without the necessary approval of the Engineer.

Variations and additional works

Corrections, comments, amendments or approval of shop drawings and samples are not to be assumed as acceptance of variations in the cost of work.

Should such approval, comments, etc, in the opinion of the Subcontractor involve additional cost, the Subcontractor shall notify the Engineer in writing within 7 days of receipt of such approval, comments, etc. In the event of notification of additional costs not reaching the Engineer within 7 days, no claims for such additional costs will be entertained.

Variations in costs shall be calculated in accordance with the labour and material rates, indicated by the Tenderer in the Bill of Quantity.

Operating and maintenance manuals

Operating and maintenance manuals are to be prepared by the Fire Detection Subcontractor for all the systems and installations for which they are responsible. This will include (but is not limited to):

- General Description of the systems
- Operating manuals for all equipment
- Maintenance requirements for all equipment and systems
    - Including lists of all spares that should be kept on hand
- Record Drawings of all system installations.
    - Including floor layouts, sections, and details of all installed equipment, plant, cables, etc. Enough detail must be provided to allow the facilities team to be able to pinpoint all the services.
    - Must include equipment numbering and all labelling

Manuals must be submitted to the Engineer at least 1 week prior to the system commissioning start date.

After approval of the manuals by the engineer, the Fire Detection Subcontractor shall provide the Engineer with bound copies as well as soft copy CD ROMs/flash drives of all MS Word, Excel and AutoCAD files as well as all manufacturers information.

Manufacturer’s catalogue information shall be scanned and saved to disc in PDF format at a rate of compression to be clearly legible.

The CD ROM/flas drive copy shall read as a catalogue with drawing files separated and all files properly indexed.

The contract will not be accepted as complete until these have been supplied, complete and to the satisfaction

of the Engineer.

The Fire Detection Subcontractor shall include for professional assistance in preparation of the above if necessary.

Guarantee and maintenance

The entire installation shall be guaranteed against defect or faulty workmanship for a period of twelve months, from date of acceptance of the Building by the Client.

The Fire Detection Subcontractor shall service and maintain the installation for a period of twelve months from acceptance of the Building by the Client.

The various items of equipment shall be serviced and maintained in strict accordance with the requirements of the respective suppliers of the equipment.

Tenderers shall include, in their tender prices, for travelling, labour, consumable, oils, lubricants, chemicals, tools, etc. necessary for the successful implementation of the maintenance programme.

Tenderers shall allow for monthly maintenance visits over the 12-month period.

The Fire Detection Subcontractor shall implement and maintain maintenance/servicing register for the duration of the maintenance and guarantee period.

A record of each maintenance visit shall be forward to the Engineer after each visit.

At the end of the guarantee period the Fire Detection Subcontractor shall hand over to the Client a full set of any special tools or instruments required for the continued maintenance of the installation.

Labelling and Painting

All labels shall be in English

Equipment

All items of equipment and plant shall be labelled. Labels shall be of engraved aluminium be securely fixed by screws or rivets. Lettering shall be block capitals in a minimum size of 8mm. The labels are to be rigidly fixed to the wall or to a framework fitted to the piping with chrome-plated screws or escutcheon pins. The use of adhesive tape will not be permitted.

Pipework

- All surface to be thoroughly cleaned with a detergent chemical solution in accordance with SABS 064 Code of Practice for the Preparation of Steel Surfaces for Coating.
- One coat of self-etching primer to SABS 723 (Wash Primer)/(Metal Etch Primer).
- One coat of zinc chromate paint to SABS 679 (Zinc Chromate Primers for Steel) Type II, Grade I.
- One coat Signal Red oleo-resinous, micaceous iron oxide paint.
- Two coats pure acrylic emulsion exterior paint to SABS 634.

All paints used shall be by the same and approved manufacturer and the Contractor shall ensure that the various paints are compatible one with the other.

Surfaces exposed on galvanised material through cutting, drilling and/or pipe grips shall be painted with Galvalloy or similar.

Danger notices

The Fire Detection Subcontractor is to allow for all danger notices in terms of the relevant regulations.

Closing in of work

The Fire Detection contractor shall give the Engineer due notice of inspections required.

No work shall be closed in without it having been inspected and approved by the Engineer.

Failure by the Fire Detection Subcontractor to request the Engineer to carry out inspections may result in the Fire Detection Subcontractor bearing the cost for uncovering of concealed work and subsequent making good.

Safety

The Subcontractor is required to submit his safety plan together with his list of responsible safety personnel. The safety plan, safety regulations in accordance with the OSH Act Construction is to be approved by the Safety Consultant and adherence will be monitored by him. The cost of equipment and supervision and procedures required for shall be included in the tendered offer compliance.

Programme

The Fire Detection Subcontractor will be required to provide a programme of works as part of their appointment. The costs of any work outside the requirements of the programme or necessary under exceptional circumstances shall be for the Employer's account only under a Variation Order if agreed to in writing before the work takes place.

Working Conditions

The Fire Detection Subcontractor will be required to work on the Fire Detection system whilst the building is fully occupied. Should a specific laydown area be required, this must be requested by the sub-contractor so arrangements can be made with the facilities manager. Costs related to provision and erection of the laydown area required, forms part of the Preliminaries and General allowance made by the sub-contractor as part of the tender.

Payment Certification

No downpayments will be paid by the client prior to any works commencing, or prior to any materials being brought to site and installed accordingly. Valuation certificates must be submitted to the Engineer within the last week of each month for assessment and approval. All works will be re-measurable upon completion of the final installation.

28. SPECIFICATIONS

The specifications to be used in the design of the mechanical service are as follows:

No	Description	Document Number
1	Flange Specification	SANS 1123
2	Identification Colour Markings: Pipe Marking	SANS 10140: Part 3
3	The application of the National Building Regulations: General Principles and requirements	SANS 10400: Part A
4	The application of the National Building Regulations: Lighting and ventilation	SANS 10400: Part O
5	The application of the National Building Regulations: Stairways	SANS 10400: Part S
6	The application of the National Building Regulations: Fire Protection	SANS 10400: Part T
7	The application of the National Building Regulations: Fire installation	SANS 10400: Part W
8	Fire testing of materials	SANS 10177- Part 2-4
9	Fire hose reels (with semi-rigid hose)	SANS 543
10	Components of underground and above-ground hydrant systems	SANS 1128: Part 1
11	Hose couplings, connectors, and branch pipe and nozzle connections	SANS 1128: Part 2
12	Symbolic safety signs: Standard signs and general requirements	SANS 1186: Part 1
13	Symbolic safety signs: Photo luminescent signs	SANS 1186: Part 5
14	Safety of luminaires: Luminaires for emergency lighting	SANS 1464: Part 22
15	Fire detection and alarm systems for buildings — System design and installation.	SANS 10139