



**ANNEXURE A: PROJECT  
INSTALLATION SPECIFICATIONS  
CARLOW ROAD & COTTLESLOE**

# TABLE OF CONTENTS

1	GENERAL.....	3
2	INSTALLATION WORK .....	4
3	Cabling.....	5
4	Safety .....	7
5	Electricity and water supply for construction purposes on site .....	7
6	Supply, transport and handling of equipment.....	7
7	Drawings.....	7
8	Workmanship and staff.....	7
9	Physical inspection procedures.....	8
10	Tests and operational inspection procedures .....	8
11	Acceptance tests.....	8
12	Maintenance of installations (12-month guarantee period) .....	9
13	Manuals.....	9
14	Training.....	9
15	As-built drawings.....	10

# 1 GENERAL

The installations shall be done and tested in accordance with the following Acts and Regulations:

## 1.1 Electronic Engineering

### 1.1.1 General standards and regulations

- a) Local municipal by-laws and regulations
- b) Local fire regulations
- c) National Building Regulations Act (No.103 of 1977)
- d) Occupational Health and Safety Act (No. 85 of 1993)
  - > Major Hazardous Installations Regulations
  - > General Safety Regulations
- e) Fire Brigade Services Act (No 99 Of 1987)
- f) Electricity act of 1987
- g) Explosive act of 1956
- h) The Application of the National Building Regulations SANS 10400

### 1.1.2 Technical standards and regulations

- a) **SANS 10139:** Fire detection and alarm systems for buildings
- b) **SANS 7240-16:** Fire detection and alarm systems Part 16: Sound system control and indicating equipment
- c) **SANS 60849:** Sound Systems for Emergency Purpose
- d) **SANS 10400:** The application of the National Building Regulations.

## 1.2 Electrical Engineering

- a) **SANS 10142-1:** The wiring of premises Part 1: Low-voltage installations

## 2 INSTALLATION WORK

NO DEVIATION FROM THE SPECIFICATION will be tolerated or paid for without the written approval of the Client.

Where no SABS guideline exists the IEC and ANSI standards will be applicable.

The installation shall be done in accordance with the drawings issued by the Engineer as approved by the Client and no installation work shall be carried out without issued for construction drawings.

All routing requirements and conduit installation work shall be done by the Electrical Contractor and all additional reticulation routes required by the tenderer shall be indicated and marked on his tender submission during the time of tender.

At the end of each day, the Contractor shall be responsible for the clean-up, removal, and secure disposal of all debris.

The complete installation shall comply with the requirements of this document. Should any discrepancies or contradictions exist between this document and the Equipment Specification for the specific security system installation, then the latter shall take precedence.

In the event of discrepancies between the drawings, specifications and bill of quantities the employer shall decide whether the work as executed shall be re-measured on site or whether re-measurement shall be effected from the working drawings only.

The Employer's authorized representative will inspect the installation from time to time during the progress of the work. Discrepancies will be pointed out to the tenderer/bidder and these shall be remedied at the tenderer/bidder's expense. Under no circumstances shall these inspections relieve the tenderer/bidder of his obligations in terms of the tender documents.

The tenderer/bidder shall notify the Employer in time when the installation reaches important stages of completion so that the Employer's authorized representative may schedule his inspections in the best interest of all parties concerned.

The conduits, draw-boxes and wiring ducts shall be installed completely by the Electrical discipline, including draw wires in the conduits.

Tenderers must submit a detailed schedule of any additional ducting and/or conduits required with their tender offers. It shall remain the responsibility of tenderer to ensure that the conduits and wiring ducts are adequate for the installation. If no such schedule is submitted with the successful tender, no additional ducting and/or conduits will be paid for under this contract. No wiring duct may be more than 60% full when the installation is complete.

- All wiring and tubing shall be properly supported and run in a neat and workmanlike manner. All conduiting and wiring within enclosures shall be neatly bundled and anchored to prevent obstruction to devices and terminals.
- The contractor shall be responsible to insure that conduit is installed by the electrical contractor and should it be found that more is required the contractor must notify the engineer of these extra requirements.
- Fire and security cables may not be tied to power cables in any way and should not be run in the same sleeve as power.

- The contractor shall enter all computer programs and data files into the related computers including all control programs, initial approved parameters and settings, English descriptors and colour graphics complete with dynamic dispersed data.
- Contractor shall complete the installation by the dates given for Practical Completion and shall return to site afterwards to do finer adjustments training and Final Handover.

### **3 Cabling**

#### **3.1 General**

All cables shall be allocated an identifiable and unique cable number.

All cables including patch leads shall be clearly labelled. Labels shall be affixed within 250mm of each termination.

Cables shall be fitted with tags at the following points:

- On the cable sheath next to the gland at each end.
- In cable pits.
- At any additional point on the cable sheath (or around the core bunch) where the preceding requirements are not readily traceable from the core terminations.
- Any inspection box or round box cover.

Cable identification tags shall be orientated uniformly to read:

- Left to right from the logical viewing point horizontally.
- From bottom to top viewed from the right where installed vertically.

Duplication of cabling and equipment identities shall be avoided at all cost.

Avoid over-tightening cable ties.

The identification numbers of cables shall be shown on "as built" drawings of the Installation.

#### **3.2 Cable Tagging Requirements**

**For the labelling of cables any one of the following methods is acceptable:**

Cable-Tie Markers

Clip-On Labels

Printable Slide-In Labels

#### **3.3 Cable Tags**

Cable tags shall be provided in accordance with SANS 10142.

#### **3.4 Markers and Tags**

**Markers and Tags shall comply with the following specifications:**

Markers and Tags shall be totally:

- UV-resistant;
- Fade-resistant;
- and Corrosion resistant.

Shall have a minimum life expectancy of 10 years.

Shall not be damaged by any commercially available solvent.

### **3.5 Equipment Fixing Requirements**

**Under no circumstances shall double sided tape be used anywhere on this installation for whatever purpose.**

#### **a) Bracket Mount**

There are different bracket bases to suit different installation surfaces. Installation on the wall should adopt wall bracket; installation on the projecting corner of two walls or on the corner of a cubic pillar should adopt the corner bracket; installation around a round pillar should adopt the pole bracket.

#### **b) Drywall**

Dry wall plugs, Toggle Bolt anchors (Butterfly nuts) or Superfast™ Toggle anchors may be used to fix bases.

#### **c) Brick Walls**

HILTI, Fisher, UPAT or RAWL type plugs are acceptable for fixing bases.

#### **d) Concrete**

HILTI gun, RAWL bolts or chemical bolts are an acceptable means of fixing bases.

#### **e) Ceilings**

For suspended ceilings, Toggle Bolt anchors (Butterfly nuts) or Superfast™ Toggle anchors are an acceptable means of fixing bases. Drywall screws will also be accepted if they are screwed directly into the support struts.

For normal ceilings Toggle Bolt anchors (Butterfly nuts) or Superfast™ Toggle anchors are an acceptable means of fixing bases.

#### **f) Steel**

**Up to 3mm:** Self-tapping screw with drill, a self-tapping screw or aluminium pop rivets (except for door hinges) are an acceptable means of fixing bases.

**Above 3mm:** bolts and nuts are an acceptable means of fixing bases.

#### **g) Wood**

Drywall screws are an acceptable means of fixing bases.

#### **h) Aluminium**

A self-tapping screw or aluminium pop rivets are an acceptable means of fixing bases.

### **3.6 Withdrawal of cables**

To ensure that all equipment cables are easily withdraw able from conduits and to ensure that there are no joints in the conductors, the Employer's representative shall have the right to have the cables of any equipment removed at his discretion. If the cables are found to be in a satisfactory condition after having been withdrawn, the Employer shall bear the cost of withdrawing and re-installing such cables. If the cables are found to have been damaged during installation or removal or if joints are found, they shall be replaced and the cost shall be borne by the tenderer/bidder.

### **3.7 Securing of equipment**

The tenderers/bidders shall make their own arrangements for securing and safe-guarding of equipment and materials.

## **4 Safety**

Correct safety procedures must be adhered to at all times and work must be carried out under the control and supervision of an experienced responsible person as detailed in Regulation C180 of the machinery and occupational safety act of 1983.

## **5 Electricity and water supply for construction purposes on site**

If electricity and water are not available to the tenderers/bidders, they shall however make their own arrangements with the relevant supply authorities and when required for connections for electricity and water, they shall supply all cabling and piping as necessary

## **6 Supply, transport and handling of equipment**

Suitable transportation vehicles and lifting tools shall be provided by the tenderer/bidder and used to load, transport and off- load such equipment.

## **7 Drawings**

The drawings generally show the scope and extent of the proposed work and shall not be viewed as showing every minute detail of the work to be executed.

The tenderers/bidders shall ensure that they are conversant with the layouts of the building and of other services before they commence with any work on the building.

Any problems that the tenderer/bidder may experience during the contract period must be discussed in time with the Consulting Engineer.

## **8 Workmanship and staff**

The workmanship shall be of the highest standard and to the satisfaction of the Employer.

All inferior work shall on indication by the Employer's inspecting officers, immediately be broken

down and rectified at the expense of the tenderer/bidder.

The Contractor shall thoroughly acquaint himself with the work involved and shall verify on site all measurements necessary for proper installation work. The Contractor shall also be prepared to

promptly furnish any information relating to his own work as may be necessary for the proper installation work and shall co-operate with and co-ordinate the work of others as may be applicable.

## **9 Physical inspection procedures**

Once the tenderer/bidder has completed the installation, written notice shall be given to the Employer in order that a mutually acceptable date can be arranged for a joint inspection.

During the inspection, the representative of the Employer shall compile a list of items (if any) requiring further attention. A copy of this list shall be provided to the tenderer/bidder that will have a period of 7 days in which to rectify the mistakes of the installation.

The tenderers/bidders shall then provide written notice that they are ready for an inspection of the remedial work to the imperfect installations.

This procedure will continue until the entire installation has been correctly completed to the satisfaction of the Employer.

## **10 Tests and operational inspection procedures**

In addition to the above the tenderer/bidder shall have the complete installation tested, commissioned and approved by the local authorities where applicable.

Subsequent to the above testing and approval, the tenderer/bidder shall in the presence of the representative of the Employer test all security systems for a period of sufficient duration to determine the satisfactory working thereof. During this period the installation will be inspected and the contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise. The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installation at completion.

## **11 Acceptance tests**

Acceptance tests shall be executed on the systems as a whole before the first delivery can take place. Successful completion of the acceptance tests will serve as proof that the system is functioning in accordance with the functional requirement of the system. No handing over of the system or execution of Tests on Completion in terms of the Contract shall take place before the Engineer is satisfied that the system conforms to the specification/s.

The test procedures must include at least the following:

- (a) Purpose of tests.
- (b) Test equipment needed/used.
- (c) Logical explanation of actions and/or measurements to be taken in order to determine compliance with the specifications.
- (d) Test reports containing the following:
  - I. Remarks.
  - II. Name and capacity of person that performed the test.
  - III. Date of tests.

IV. Space for acceptance of the test report by the Engineer and the Employer.

V. Compliance Checklist

## **12 Maintenance of installations (12-month guarantee period)**

- a) With effect from the date of the First Delivery Certificate the tenderer/bidder shall undertake the regular servicing of the installation during the **12-month guarantee period** and shall make all adjustments necessary for the correct operation thereof.
- b) If during the said period the installations are not in working order for any reason for which the tenderer/bidder is responsible, or if the installations develop defects, they shall immediately upon being notified thereof take steps to remedy the defects and make any necessary adjustments.
- c) Should such stoppages be so frequent as to become troublesome, or should the installations otherwise prove unsatisfactory during the said period the tenderer/bidder shall, if called upon by the Representative/Agent, at their own expense replace the whole installation or such parts thereof as the Representative/ Agent may deem necessary with apparatus specified by the Representative/Agent.
- d) The contractor must be able to render a 24-hour maintenance and repair service at all times, excluding statutory holidays. Full details of the firm's standby service facilities must be submitted at the time of tendering.

### **1.1 Preventive Maintenance**

Planned servicing of the systems carried out on a scheduled basis.

- **Recommended frequency of maintenance**

**The systems shall receive at least one planned maintenance visit each year.** However, additional planned maintenance visits may be required depending on the complexity of the system, the environmental conditions, and the need to change 'perishable items' etc.

**Note:** These planned maintenance visits are in addition to any service call visits which may be required.

## **13 Manuals**

Three (3) copies of operating manuals shall be handed over to and signed for by the Representative/Agent on site together with the drawings and schedules described. All operators' instruction manuals must be in English. The contents of the manuals shall reflect the training contents (operator) and maintenance.

## **14 Training**

After completion of the installation and when the system is in working order, the Contractor will be required to thoroughly train the operators in the complete operation and control of the system, including the basic adjustments and alignments to be made, until the operators is fully conversant with the equipment and its use.

- a) All training shall be by the contractor and shall utilise specified manuals, as-built documentation and the on-line help utility. The following training shall be repeated quarterly during the warranty period.
- b) Operator training shall include two initial two-hour sessions encompassing Sequence of operation review

## **15 As-built drawings**

As each portion of the work is completed, the tenderer/bidder shall provide the Employer with as-built drawings showing the exact locations of all equipment deemed necessary for the perfect operation of the systems.

System architecture showing all devices/equipment will be required.

Data sheets of all products