



FCO SERVICES

Part of the Foreign and Commonwealth Office

FCO Services

Santiago Residence

Fire Detection & Alarm System

Scope of Works

© Crown Copyright 2014. No part of this document may be reproduced in any form or by any means, electronic or mechanical, including photocopying, for any purpose other than for use by the Foreign and Commonwealth Office without the express permission of FCO Services.

PLEASE DO NOT PHOTOCOPY THIS DOCUMENT

This will help us keep track of its circulation so that we can keep you up to date.

Further copies are available on request from: James Dean, British Embassy, Buenos Aires

UNCLASSIFIED

Document Control

Document Name	Santiago Residence Fire Detection & Alarm System – Scope of Works
Author	
Version	v 0.1

Document Distribution

Name	Reason

Change History

Version	Date	Revisions
v0.1	10-02-14	Final –

Abbreviations

Abbrev.	Meaning
FCOS	Foreign and Commonwealth Office Services
FCO	Foreign & Commonwealth Office

Selected References

#	Document Name	Version	Date
HSP 9.64	FCO Guidance on Electrical Installation Requirements	Issue 3	June 2011

Table of Contents

Document Control	2
Document Distribution	2
Change History	2
Abbreviations	2
Selected References	2
1 GENERAL REQUIREMENTS	5
1.1 LOCATION OF SITE	5
1.2 DESCRIPTION OF WORKS	5
1.3 INSTRUCTIONS TO TENDERERS.....	6
1.3.1 Tender.....	6
1.3.2 Format of Tender.....	6
1.3.3 Tenderer to Inform Himself	7
1.4 PROGRAMME	7
1.5 GENERAL REQUIREMENTS.....	7
1.5.1 Site Supervision	7
1.5.2 Electrical and Builder's Work Requirements	8
1.5.3 Disruption of Existing Services	8
1.6 LABELS	8
1.7 INSPECTION, TESTING & COMMISSIONING	8
1.8 AS INSTALLED DRAWINGS	9
2 SCOPE OF WORK	10
2.1 STANDARDS	10
2.2 GENERAL REQUIREMENTS.....	10
2.3 CORORDINATION.....	11
2.4 GENERAL TECHNICAL REQUIREMENTS.....	11
2.4.1 Electrical Supply.....	11
2.4.2 Earthing Requirements.....	11
2.4.3 Climate Conditions	11
2.4.4 Accessibility.....	12
2.4.5 Storage of Materials and Equipment	12
2.5 DETAILED SCOPE OF WORK	12
2.6 SUPPLY TO SYSTEM	13
2.7 FIRE ALARM SYSTEM SCOPE OF WORK.....	13
2.8 TESTING AND COMMISSIONING.....	16
3 TENDER SUMMARY	17

UNCLASSIFIED

3.1	TENDER SUMMARY	17
3.2	PRICING SCHEDULE	17
3.3	WORK ON ELECTRICAL INSTALLATIONS	19
4	DRAWINGS.....	20
4.1	TENDER DRAWINGS.....	20

1 GENERAL REQUIREMENTS

1.1 LOCATION OF SITE

The Residence, property number CLS 003B, is situated at the British Embassy Residence located in Av. Gertrudis Echenique 96, Las Condes, Santiago, Chile which also includes:

- Transit flat CLS 105E
- Transit flat CLS 111E
- Guard house

1.2 DESCRIPTION OF WORKS

The scope of these works covers the removal of the existing wireless fire detection and alarm system and the installation and commissioning of a new wireless, addressable, analogue fire detection and alarm system for the Residence and compound buildings.

The classification of the new system is LD1 (installed throughout the compound buildings, incorporating detectors in all circulation spaces that form part of the escape routes from the dwellings, and in all rooms, offices and areas in which fire might start, other than toilets, bathrooms and shower rooms).

The fire alarm installation in the residence building must be highly sympathetic to the building and decoration - especially in representational rooms.

Prior to the installation of the fire detection system and before any equipment is ordered, a comprehensive survey of the site MUST be carried out by the Contractor to verify correct operational viability of the final locations agreed by the Project Manager. The survey results and drawings shall be presented to the Project Manager or his representative for verification before the start of the installation.

The new system will require only limited cabling. However there are very limited cable ways within the building. All cable routes must be agreed with the project manager prior to commencement. Further investigation will be required by the Contractor on site.

The works shall include all associated electrical and builders work in connection with the installation.

The installation shall comply with the requirements of BS 5839-1:2002+A2:2008.

All equipment supplied as part of the fire detection and alarm system shall conform fully to the requirements of the following international standards:

- EN 54 Fire detection and fire alarm systems (including EN 54-25:2008 and EN54-25:2008/AC:2010 Fire detection and fire alarm systems – Part 25: Components using radio links)
- ISO 9001:2008 Manufacturing Quality Management System, as certificated by the Loss Prevention Certification Board (LPCB) or other National Accreditation Agency

The fire alarm indication equipment shall be an analogue addressable radio fire panel as Cooper Safety CW9000, **or equal and approved**. The detection equipment shall be a combination of optical smoke detectors and rate-of-rise heat detectors as Cooper Safety CWD9210 range **or equal and approved**. Detectors shall include integral alarm sounders and alarm beacons as indicated on the contract Drawings.

The Cooper Safety CWD9210 ranges of sensors are based on multi-sensor technology combining optical smoke detection and configurable heat detection (fixed, rate-of-rise & high temperature). The Cooper Safety CWD920 Sensor AV range are as CWD910 with an integrated alarm sounder and alarm beacon.

To maintain compatibility throughout the complete system, for the purpose of tendering, the above manufacturer's equipment shall be included in the tender bid. Alternative **wireless systems/suppliers** will be considered. Any proposed alternative **wireless system/supplier** must be suitable for installation in any part of the Residence.

The fire alarm system shall be configured as a **single wireless loop** with the addition of wireless booster panels as necessary.

The existing system shall be maintained operational until the new system has been commissioned and is working correctly. All existing alarm and associated parts thereof shall be removed once the new system is commissioned and up and working.

The Contractor shall take special care to ensure that protection is provided to all furniture and the contents of the buildings, offices, residence and staff.

1.3 INSTRUCTIONS TO TENDERERS

1.3.1 Tender

The Specification and Drawings indicate the requirements for the installation works.

The successful Contractor shall allow for all materials and labour to complete the works unless indicated otherwise, including all electrical and builder's work and protection to the fixtures, fittings and building fabric.

The Contractor shall allow for installing off all items indicated in the documents including any shown as 'free issue'.

1.3.2 Format of Tender

The tender conditions and format shall be in accordance with the requirements laid out by the FCO.

The documents returned with the Contractor's tender shall include, but not necessarily be limited to the following:-

- Details of key personnel who will be involved with the project
- Health and Safety Plan
- Indicative programme for the works
- Completed tender summary (the works are to be undertaken as a lump sum contract).
- Pricing Schedule.
- The Contractor shall allow for all costs.
- Details of all insurances, including Public Liability

1.3.3 Tenderer to Inform Himself

It will be deemed that the Tenderer has thoroughly acquainted himself with the nature of the works and the conditions under which the work will be executed. The Contractor can, if deemed necessary, make arrangements to visit the property through the Project Manager or his/her representative at Post.

1.4 PROGRAMME

The Contractor shall contact Paula Orellana to agree the programme, prior to works commencing, but it is expected that all works shall be undertaken during March 2014.

The Residence will remain operational throughout the programmed works. It may be necessary to amend the programme due to daily operational requirements of the Residence and the Contractor should make some allowances for this within the tender.

Indicative (Office) Working Hours

- Monday – Friday 09:00 – 16:00 out-of hours working subject to Post
- Saturday and Sunday – No weekend works will be permitted.

The Contractor shall note, due to operational requirements no works will be permitted during the month of January 2012.

1.5 GENERAL REQUIREMENTS

1.5.1 Site Supervision

The Contractor shall keep a competent Site Forman in charge of the works during all working hours, who will be the duly accredited representative of the Contractor, empowered to take instructions from the Project Manager or his/her representative and to execute them.

1.5.2 Electrical and Builder's Work Requirements

The Contractor shall carry out all necessary Electrical and Builder's Works associated with the contract.

1.5.3 Disruption of Existing Services

Any temporary disruption or disconnection of existing services which will be necessary to carry out the works shall only be made at such times as is agreed with the Project Manager or his/her representative. This shall not be unreasonably withheld in order to allow the works to proceed in an economical manor. The programme and sequence of the works will be agreed with **the Project Manager and Head of Corporate Services** prior to the works commencing.

1.6 LABELS

All Zone charts and equipment shall be labeled indicating the area and circuit reference **in English and Turkish**.

1.7 INSPECTION, TESTING & COMMISSIONING

The installation shall be snagged by the Contractor and inspected by the Project Manager or his/her representative, before final acceptance.

The Project Manager shall be offered the installation for witness testing upon completion of the works. The Contractor shall only offer the system to the Project Manager for final witnessing once he has satisfied himself that the system is ready.

The fire alarm installation shall be tested and commissioned in accordance with BS 5839-1:2002+A2:2008, which shall include:-

- An audibility test of the alarm devices. Audibility level readings shall be taken in each room. Any sound levels found to be lower than 65 db(A) shall be reported to the Project Manager or his/her representative in writing
- All trigger devices ie: manual call points, heat and smoke detectors shall be tested for correct operation
- A mains failure test shall be carried out to verify correct operation of the back-up battery system

Prior to commissioning, the Contractor shall provide a certificate of installation and cable test certificates of the system to the Project Manager or his/her representative.

1.8 AS INSTALLED DRAWINGS

The Contractor shall handover to the Client two sets of record drawings for approval. When accepted, the formal issue shall comprise: -

- 2 sets of paper prints
- 3 computer compact discs containing CAD record Drawings on the latest AutoCAD version and the site scan and survey results (entire memory content of the Device Unit Survey Tool following the site survey).

Record drawings, including diagrams and schedules, shall show all the information necessary so that the installation can be operated, maintained, inspected and tested so as to prevent danger, as far as is reasonably practicable. They shall incorporate a fire zone drawing showing plans of the building with all fire alarm control and indicating equipment clearly indicated. Each fire compartment/zone shall be easily identified by means of clearly marked colour codes.

A fire zone chart shall also be produced and be as a minimum sized A3, coloured and suitably framed for handover on completion of the works.

All notes on drawings shall be in English.

2 SCOPE OF WORK

2.1 STANDARDS

All equipment and installation works shall be carried out in accordance with the requirements of:

- BS 5839-1:2002+A2:2008 Fire detection and fire alarm systems for buildings
- IEE Wiring Regulations BS 7671:2008+A1:2011
- HSP9.64 Foreign & Commonwealth Office Guidance on Electrical Installation Requirements

2.2 GENERAL REQUIREMENTS

All general provisions contained within this, or any other section of the Specification shall be fully applicable to each and every other section.

All work carried out on the installation shall be carried out in a neat, efficient and workmanlike manner to provide for proper operation, maintenance and repair. The work shall be in accordance with the requirements of these Specifications and shall fulfill their true intent and meaning. No deviations from these Specifications and/or Drawings shall be made without the Project Manager's written approval.

The Specification and Drawings form a composite set of documents intended for the selection and installation of equipment having the general and specific characteristics as detailed.

The Specification and Drawings show the equipment to be supplied and installed by the Contractor. Where equipment or services are to be supplied or installed by others, it is noted accordingly.

Unless otherwise specifically stated, the installation shall be left complete, tested and operating in all respects and fully integrated and coordinated with all other construction and installation works.

The Contractor shall make any temporary connections and carry out other temporary works, as required for the installation of the works. Adequate precautions shall be made to ensure that the installation and building is safe at all times.

Where an item of equipment is shown, the Contractor shall allow for the connection of the equipment with a suitably rated, heat resisting, flexible cable and isolating switch whether supplied by the Contractor or others.

The locations of all fire alarm detectors and devices as shown on the drawings are for reference only. The final location of all detectors and devices must be agreed with the Project Manager prior to installation.

2.3 CORORDINATION

The Contractor shall be solely responsible for the proper coordination of all phases of the work and timely delivery to the site of all equipment and materials for proper execution of the work.

It is the Contractor's sole responsibility to fully coordinate the work with all, or any other disciplines, and to ensure proper phasing of the work to ensure continuity of all works under this Contract. If it becomes necessary to remake any part of these works or that of any other discipline or trade as a result of poor or badly timed coordination, then all costs associated with remaking those works shall be borne by the Contractor.

The Contractor shall take into consideration all statutory and local requirements issued by the local authority, telephone and telecommunications authorities along with any other requirements to be considered for the correct and legal operation of the electrical installation or equipment connected to the installation as part of this contract.

2.4 GENERAL TECHNICAL REQUIREMENTS

2.4.1 Electrical Supply

Contractor to survey and report on the current electrical supply and install alarm system to fully compliment this.

2.4.2 Earthing Requirements

The earthing system shall in all respects comply with the following: -

- IEE Wiring Regulations BS 7671:2008+A1:2011
- All other requirements stated within this Specification

The earthing conductor (the final conductor by which the connection to the selected means of earthing is made) is to be of copper construction and comply with the requirements of BS 7671:2008+A1:2011.

All extraneous conductive parts are to be protected by equipotential bonding in accordance with BS 7671:2008+A1:2011. Minimum size 4mm Green/Yellow.

Cables used throughout the installation shall have the earth conductor connected at each outlet/device.

2.4.3 Climate Conditions

Except as stated below, all equipment shall be rated for an ambient dry bulb temperature of 35.9°C and 12.8°C wet bulb.

When equipment is installed in direct sunlight, it shall either be shielded from direct radiation or suitably rated for additional solar gains. Cables shall always be shielded from direct sunlight, if necessary, by the installation of ventilated cable covers.

All equipment shall be rated for continuous service twenty-four hours a day, seven days a week throughout its normal rated life, except for necessary routine maintenance.

2.4.4 Accessibility

All work shall be so installed as to be accessible for operation, maintenance and repair. Deviations from the Drawings may be made to accomplish this, but no change shall be made without the Project Manager's written approval. The Project Manager shall approve the Main Wireless Fire Panel location and the location of any necessary Wireless Booster Panels before installation work is commenced.

2.4.5 Storage of Materials and Equipment

All materials and equipment, fixed or unfixed, shall be protected against corrosion, deterioration and ingress of foreign matter. All equipment shall be protected against the weather and shall be kept clear of the floor and ground by wooden bearers or other means.

2.5 DETAILED SCOPE OF WORK

The Contractor shall supply, install, test, commission and set to work the fire detection and alarm system installation as detailed within the Specification and as shown on the Drawings. Where any work or equipment is to be furnished by others, it is noted accordingly in these Specifications or on the Drawings.

The installation will consist of a main addressable fire alarm panel, located in the compound security office and any wireless booster panels as necessary. The locations of all fire alarm detectors and devices as shown on the drawings are for reference only. The final location of all detectors and devices must be agreed with the Project Manager prior to installation. The detection and alarm system must incorporate coverage for all the compound buildings including the transit flats, garage and security office.

Each zone is to have its own wireless testing point located at a convenient location at a convenient wall height for testing each zones detectors and alarms. Location of testing points to be agreed with the project manager.

The work includes, but is not limited to, the following areas, principle systems and equipment:

- Areas included as part of the Fire Alarm Replacement Works
 - Residence
 - Transit flats
 - Garage
 - Basements
 - Plant rooms
 - Security office
 - Stores

- Common areas
- attics
- Decommissioning and Removals
 - The removal and disposal of all redundant fire detection and alarm system equipment and cables associated with the existing installation
- Distribution
 - The **new wireless system** will require only limited cabling. Further investigation will be required by the Contractor on site
- Power Supply to the Fire Alarm System
 - Cables and terminations
 - Safety switches/isolators
 - Final power connection to the Main Fire Panel and all necessary **Wireless Booster Panels**
- Testing and Commissioning
 - The Fire Alarm system shall be tested in accordance with BS 5839-1:2002+A2:2008
 - The supply circuits shall be tested in accordance with BS 7671:2008+A1:2011
 - Recording results for each system on approved test sheets
 - Other tests as required for proving compliance with the Specification

The Contractor shall ensure that adequate control measures are in place (padlocking of switchgear, warning notices, etc.) to protect the occupants, visitors, staff and site operatives during the works.

The property will remain occupied throughout the works. Therefore systems, equipment and services associated with the property shall remain operational throughout the works if required. The services shall be protected where required and interruptions to services kept to a minimum.

2.6 SUPPLY TO SYSTEM

The fire alarm system Main Panel and all necessary Wireless Booster Panels shall be connected to a dedicated mains supply circuit via a suitably rated double pole circuit breaker or isolator. The existing mains supply shall be inspected and tested and, if adequate, reused for the new fire alarm main panel.

The power supply at the distribution board for the Main Fire Panel and all Wireless Booster Panels shall be labeled 'FIRE ALARM - DO NOT SWITCH OFF'.

2.7 FIRE ALARM SYSTEM SCOPE OF WORK

Prior to the installation of the fire detection system and before any equipment is ordered, a comprehensive survey of the site MUST be carried out by the Contractor to verify correct operational viability of the design. The survey shall include, but not limited to:

- Site Scan – to investigate the radio environment across the site for signs of interference.
- Initial Site Survey – to ascertain if Booster devices are required.
- **Booster allocation** – decide on **Booster requirements** and survey them along with their associated devices.
- Review – Analyse the data to ensure system is viable. Save Scan and Survey Data to Compact Disc (CD).
- Verification – Send survey data and drawings to Project Manager for verification before start of installation.

The Contractor shall replace the existing fire detection and alarm system in the Residence with a **new wireless, addressable, analogue fire detection and alarm system.**

The new fire alarm system shall have 1 wireless loop capable of supporting 250 devices as Cooper Safety CW9000. Each necessary Wireless Booster Panel shall be capable of supporting 28 wireless devices as Cooper Safety CWB9500.

The Contractor shall install new automatic **detection devices, sounders, beacons, manual call points and testing points** as shown on the drawings.

The Contractor shall programme the fire alarm system. The exact requirements for programming shall be agreed with the Project Manager. The activation of any detector or manual call point shall:

- Be indicated on the Main Fire Panel
- Activate all Residence sounders and beacons
- Initiate Residence evacuation

The existing fire alarm panel, sounders, call points, detection devices and associated cabling etc. shall be removed as part of the works only when the new fire alarm system is fully operational.

The Contractor shall issue commissioning sheets of the completed works.

The Contractor shall supply record Drawings.

The Contractor shall supply the following spare parts:

- 5 spare smoke/heat/sounder detectors
- 3 spare smoke/heat/sounder/beacon detectors

- 2 spare manual call points (break glass units).
- spare base units

The resettable element of all manual call points (break glass units) shall be plastic.

All fire alarm components shall be correctly rated for the environment in which they are installed. The location of the external sounder/beacon shall be approved by the Project Manager before installation.

The main fire alarm panel shall have zonal charts installed adjacent to it.

The fire alarm panel and each necessary wireless booster panel(s) shall have battery backup. Minimum of 24 hours. This includes being included on the emergency generator supply.

The fire alarm panel and each necessary wireless booster panel shall be served from a new local fused connection unit.

All smoke and heat detectors shall have a warranted 10 year lithium battery.

All cable entries to any fire alarm component shall be glanded and terminated as per the manufacturer's recommendations.

The fire alarm installation in the Residence is a Category LD1 system.

Power cabling shall be concealed where possible.

The Contractor shall be responsible for making good to the building structure where the works have affected the building structure/fire integrity. Post will provide a painter for making good elsewhere.

The Contractor shall supply an Operating and Maintenance Manual (O&M Manual) upon completion of the works. A draft electronic version of the O&M Manual shall be given to Post and FCO Services on the Handover day. The final O&M Manuals shall be given to Post and FCO Services within one calendar month of Handover. The O&M Manuals shall be in paper format and on a computer disk and shall contain the following minimum information:

- System Category (i.e. LD1)
- Description of system operation
- Manufacturer's recommended maintenance procedures and faultfinding information
- Record Drawings
- Cause and effect schedule
- Table of interfaced devices including programming attributes
- Flow chart of interface operation including programming attributes
- Commissioning schedules
- Device/point schedule (device reference/description)
- Material data sheets
- Cable test sheets

- Details of the system power supply origin/protection
- Emergency and supplier contact details
- Commissioning/Completion certificates

2.8 TESTING AND COMMISSIONING

The Contractor shall carry out the following procedures: -

- The Fire Alarm installation shall be tested and commissioned. The Project Manager shall be offered the installation for witness testing upon completion of the works. The Contractor shall only offer the system to the Project Manager for final witnessing once he has satisfied himself that the system is ready.
- Only an experienced commissioning engineer, who has been trained on the specific system installed, shall carry out the commissioning of the installation.

The fire alarm installation shall be tested and commissioned in accordance with Clause 26.5 of BS 5839-1:2002+A2:2008 which shall include:-

- An audibility test of the alarm devices. Audibility level readings shall be taken in each room. Any sound levels found to be lower than 65 db(A) shall be reported to the Project Manager or his Representative in writing.
- All trigger devices i.e.: manual call points, smoke and heat detectors shall be tested for correct operation.
- A mains failure test shall be carried out to verify correct operation of the back-up battery system.

Prior to commissioning, the Contractor shall provide a certificate of installation and cable test certificates of the system to the Project Manager or his Representative.

2 levels of passwords shall be set up as part of the commissioning process (User Code and Engineer's Code). The commissioning engineer will be notified of these during the contract period. Once the tests have been witnessed, issue a typed Inspection, Completion Certificate and Fire Alarm Log Book.

3 TENDER SUMMARY

3.1 TENDER SUMMARY

To provide materials and install fire alarm systems as per the Specification and Drawings issued, meeting the requirements of the BS 5839-1:2002+A2:2008, and the IEE Electrical Wiring Regulations BS 7671:2008+A1:2011 and the FCO Electrical Standards.

3.2 PRICING SCHEDULE

If the site survey determines that the Residence is not suitable for an RF Fire Detection and Alarm System then only Part A of the Pricing Schedule will apply. If the site survey verifies the suitability of the Residence both Part A and Part B will apply.

3.2.1 Part A (Site Survey Only)

1.	Comprehensive Radio Frequency Site Survey	£
.....		
2.	Any other items associated with RF Survey only (please specify)	£
.....		
TOTAL		£

SIGNED: _____	Date: _____
POSITION: _____	_____
COMPANY _____	_____
NAME: _____	_____
ADDRESS: _____	_____

3.2.2 Part B (Installation/Commissioning Only)

3.	Residence Compound Fire Detection & Alarm System Installation	£
.....		
4.	Builder's work associated with the installation	£
.....		
5.	Removal and disposal of redundant installations	£
.....		
6.	Any other items required to complete the installation in accordance with the Drawings and Specification (excluding Site Survey), including maintaining the building operational.	£
.....		
7.	Wireless Booster Panels (dependant on Survey) Provisional Sum	£3,000.00
.....		

UNCLASSIFIED

	£
<hr/>	
	£
<hr/>	
8. Preliminaries	£
<hr/>	
9. Other (please specify)	£
<hr/>	
TOTAL	£

SIGNED: _____ Date: _____
POSITION: _____
COMPANY _____
NAME: _____
ADDRESS: _____

3.3 WORK ON ELECTRICAL INSTALLATIONS

General schedule of rates:

The schedule is intended to identify time cost charges based on a 60-hour working week, for any type of work carried out on an electrical installation (including work related to fire alarm systems).

Forman/Lead Electrician responsible for the project on site	Quantity	Rate
Time Charge – Weekly Rate	1 Week	£
Time Charge – Daily Rate	1 Day	£
Time Charge – Hourly Rate	1 Hour	£

Electrician

Time Charge – Weekly Rate	1 Week	£
Time Charge – Daily Rate	1 Day	£
Time Charge – Hourly Rate	1 Hour	£

Electrician's Mate / Helper

Time Charge – Weekly Rate	1 Week	£
Time Charge – Daily Rate	1 Day	£
Time Charge – Hourly Rate	1 Hour	£

Commissioning Engineer

Time Charge – Weekly Rate	1 Week	£
Time Charge – Daily Rate	1 Day	£
Time Charge – Hourly Rate	1 Hour	£

4 DRAWINGS

4.1 TENDER DRAWINGS

The following drawings shall be read in conjunction with the Specification:

DRW: No:	Basement Fire Alarm Layout
DRW: No:	Ground floor Fire Alarm Layout
DRW: No:	First Floor Fire Alarm Layout
DRW: No:	Second Floor Fire Alarm Layout
DRW: No:	Roof/Attic Fire Alarm Layout
DRW: No:	Fire Alarm Installation Schematic
DRW: No:	Transit Flat 015E
DRW: No:	Transit Flat 111E
DRW: No:	Guard House
DRW: No:	Garage

TYPDET - FIRE - 1 OF 4	Fire Detection systems Typical Details Sheet 1 of 4
TYPDET - FIRE - 2 OF 4	Fire Detection systems Typical Details Sheet 2 of 4
TYPDET - FIRE - 3 OF 4	Fire Detection systems Typical Details Sheet 3 of 4
TYPDET - FIRE - 4 OF 4	Fire Detection systems Typical Details Sheet 4 of 4

5 FCO Guidance on Electrical Installation Requirements