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100 PERFORMANCE OBJECTIVES

To provide a secure and maintained two way communication system within the building for the functions of Fire Telephone, Stewards communication system, Disabled Refuge Communication and Disabled Toilet Alarm Signalling.

All functions shall be combined in a single system, manageable from multiple locations where appropriate, to prevent miscommunication.

A single Master Handset shall take control during an emergency, and all communication between outstations, including conference calling shall be controlled from that Master Handset.

200 DESIGN PARAMETERS

The EVC system installation will comply fully with the edition (including amendments) of each of the following, current at the time of tender: -

Building Regulations Approved Document
B Building Regulations Approved
Document M

The Fire Precautions (Sub-surface Railway Stations) Regulations

The Fire Safety and Safety of Places of Sport Act

BS 31 Specification. Steel conduit and fittings for electrical wiring

BS 9999 Fire precautions in the design, construction and use of buildings

BS 5839 Part 9 - Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems

BS 7594 Code of Practice for audio-frequency induction-loop systems (AFILS).

BS 7671 Requirements for Electrical Installations: IEE Wiring Regulations.

BS 7807 Code of practice for design, installation and servicing of integrated systems incorporating fire detection and alarm systems and/or other security systems for buildings other than dwellings.

BS 7827 Code of practice for design, installation and servicing of sound systems for sports stadia

BS 8300 Design of buildings and their approaches to meet the needs of disabled people. Code of practice

BS EN 54-4 Fire detection and fire alarm systems. Power supply equipment

BS EN 50086 Specification for conduit systems for cable management

BS EN 60118-4 Hearing aids. Magnetic field strength in audio-frequency induction loops for hearing aid purposes

BS EN 60702 Mineral insulated cables and their terminations with a rated voltage not exceeding 750V

300 SYSTEM DESIGN

An EVC system enables communication between strategic points throughout the building or site and the central control point(s). EVC systems are needed in the following situations:

- a) In any building or sports or similar venues where there are disabled people or people who may have difficulty negotiating the evacuation route.
- b) In buildings with phased evacuation and/or fire-fighting lifts where it facilitates secure communications for building managers, fire wardens and attending fire officers.
- c) At sports venues and in similar complexes, where it will assist stewards in controlling the evacuation of the area in an emergency.

In some buildings it might be necessary to take into consideration that the EVC system will address multiple uses and the outstation design will reflect its intended use.

310 Design Guidance

The following should be consulted when determining the type and function of an EVC system:

- a) Approved Document B (Fire safety) – Volume 2: Buildings other than dwelling houses
- b) BS 9999;
- c) Guide to Safety at Sports Grounds, Fifth edition, 2008
- d) Fire Safety Guide No 3, Phased Evacuation from Office Buildings. London District Surveyors Association
- e) Guidance documents that support fire safety legislation;
- f) Any authority responsible for enforcing fire safety legislation that applies to the premises.

320 Outstation Choice

In general the following rules can be applied to Outstation choices:

- i. Type A – For all uses by the fire service or fire wardens, and in all fire fighting lift lobbies
- ii. Type B – In locations primarily used by the Public, a refuge point shall be supplied in all designated refuge areas
- iii. Emergency Assist Call Points – In disabled toilets or shower areas, where attention is sought, but conversation is not required.

330 Outstation Position

For the position of Type A, and B outstations Building regulations document B should be consulted, for the location of Emergency Assist alarms Building Regulations Document M should be consulted.

340 Documentation

341 Issue Design certificate as required by BS5839 part 9 :2011.

400 SYSTEM COMPONENTS

The system shall comprise of three Functional Elements:

- a) Master Handsets (Master Controllers)
- b) Exchange Units (Slave Controllers)
- c) Outstations (Type A, Type B or Emergency Assist Call Points)

On smaller systems items a and b may be combined into a single unit.

410 Master Handsets

Master Handsets shall be positioned at the main point(s) of attendance within the building or complex, and shall be used to control all functions of the EVCS.

411 Master Controls and Indication

As a minimum the following LED Indications shall be provided on all systems:

- Supply present (energised) - A green LED denoting presence of power
- Supply Fault – A yellow LED denoting a fault in either the Mains or Battery Supply
- General Fault – A yellow LED denoting any fault on the system
- System (CPU) Fault – A yellow LED denoting a code checksum fail or watchdog event

For systems of five outstations or less, control shall be by use of a single button per line with RED LED call and Yellow LED Fault indication per line.

412 For all other systems control and indication shall be by a clear high contrast white backlit four line, twenty characters LCD with a high contrast blue diffuser, giving clear indication of:

- Current Calls
- Faults and logs
- System Status
- Outstation Directory
- System Menus

413 Control of the LCD shall be by a three button navigation system with the following functions

- Left (Down)- Scroll down a menu or decrement a value
- Centre (Accept)-Accept currently highlighted value
- Right (Up)- Scroll up a menu or increment a value

420 **Slave Exchanges**

421 Slave exchange units interface outstations to the EVCS controller, in smaller systems this will be combined within the master controller, in larger systems these will be distributed enclosures.

422 The slave exchange shall be housed in a metal enclosure with sufficient 20mm gland knockouts for all required cables and suitable for mounting in a riser cupboard.

423 The slave exchange shall house a power supply for its own operation and the supply of current to master handsets as required including

- A battery and charger to meet the requirements of EN54-4.
- Ensuring the battery support has sufficient capacity to maintain the system operation for up to 24 hours in a quiescent mode and 3 hour operation.
- Ensure the battery charger is capable of re-charging discharged batteries to 100% of their rated capacity within a 24 hour period and more than 80% within 12 hours.
- Ensure the power supply in the battery charger has a constant voltage output with compensation for variation in battery temperature. Check batteries are protected from discharge by a solid state switch which disconnects the negative terminal.
- Design the power supply and supervisory board to maintain the batteries, on float charge and in good condition, for ten years at an ambient temperature of 25 degrees C. Ensure the charger compensates for ambient temperature changes in order to maximise the battery life and minimise the recharge time.

430 **Type A Outstations**

431 These outstations shall comprise a solid metal enclosure with a push door, and provided in either RAL3000 with a white screen print or in a brushed stainless steel finish with a red screen print.

432 The enclosure shall contain a robust red handset on an extendable coiled cable.

433 The answering of a call, or the initiation of a call shall be by the lifting of the handset alone, no other actions shall be required

434 The enclosure should contain a red confidence LED which should light solidly when the handset is on hook, and flash when the outstation is being called.

435 A sounder shall be present in the enclosure and ring when the outstation is being called.

440 **Type B Outstations**

441 These outstations shall comprise a solid metal enclosure and provided with a green screen print with a white detail, or in a brushed stainless steel finish with a red etched print.

442 The outstation shall be hands free in operation.

443 The answering of a call, or the initiation of a call shall be by pressing the call button, no other actions shall be required

444 The unit shall contain a red confidence LEDs which flash every three seconds to locate the call point in low light conditions, and light solidly when a call is connected.

445 A sounder shall be present in the enclosure and ring when the outstation is being called.

Tactile Braille shall be applied to the unit to identify the operation and raised edges shall be applied to the label to identify operational buttons.

450 **Emergency Call Outstations**

451 The emergency Call outstation comprises three components, the pull cord, the over door indicator and the cancel point.

452 The disabled call system shall receive all power from the EVCS system and not require a local supply unit.

453 The interconnection for this unit shall be monitored by the EVCS by use of a 10K resistor in the pull cord unit

454 The cancel point shall be white with a blue label showing the word "CANCEL" in white text and Braille, it shall have a blue halo which lights when the pull cord is operated

455 The over door indicator shall comprise a blue indicator on a white plate and a high level sounder, which illuminate/sound when the pull cord is activated

500 INSTALLATION**510 Responsibilities**

The EVCS installer shall coordinate with other installers to ensure correct inter-operability with other systems (including but not limited to BMS, electrical, ceiling contractor) and to achieve proper spatial control of equipment and components.

Install all equipment in the locations as indicated on the design drawings.

Ensure all equipment (except portable equipment) is firmly held in place. Check fastenings and supports are adequate to support their loads with a safety factor of at least three. If attachment to roof truss members is required to lift equipment into place, only attach by permanent lifting eyelets provided in the roof truss. Do not weld or drill the steel roof truss, use approved clamping arrangements employing neoprene or similar bearing pads for permanent attachment to trusses, protecting the truss finish.

Use multi-pin connectors or terminals to mechanically and electrically interconnect various items of equipment.

520 Cabling

521 Earth EVC cabling in accordance with BS 7671.

522 All wiring for Type A outstations and all network cables shall be in enhanced type fire resisting cables.

523 Type B outstations shall be wired in standard rated fire cables, except where they are at increased risk of exposure to fire in adjoining fire compartments.

524 Disabled call units shall be wired in two core LSF cables as a minimum.

Lay the cabling on the dedicated fire alarm system/ EVC cable tray throughout the complex. Where cables are installed on tray, fix the cables using fire rated clips.

530 Documentation

531 Issue an installation certificate as required by BS 5839 part 9 :2011

600 TESTING AND COMMISSIONING

Following the installation of the system, it shall be fully tested, commissioned and demonstrated to the client in accordance with the manufacturer's recommendations and those of the Standards listed in clause W15.200 of this specification. Liaise with manufacturers of the interfaced systems to ensure all tests and demonstrations are fully coordinated.

610 Tests

611 Fully test calling from all outstations to master handset or handsets

612 Test calling from all master handsets to each Outstation

613 Report any excessive noise on communication links

614 Measure the background noise at each of the master handset locations and ensure this is below 45dBA

615 Ensure no sounder or Voice Alarm speakers are in Refuge locations

620 Procedure

621 Fully demonstrate the complete operation of the system to the satisfaction of the Engineer.

622 Prepare a fully detailed method statement for the test, commissioning and demonstration stating exactly how these are to be carried out including interface with the Fire Alarm system. Submit the statement to the Engineer for comment one month in advance of the test.

623 Fully test the EVCS to ensure the correct operation of all Master handsets and outstations.

624 Provide three hard copies of the results on A1 or A0 layout drawings and include in the O&M instruction manuals. Provide electronic copies of the drawings in AutoCAD 2000 format on a CDROM.

630 Documentation

631 Issue a system test certificate detailing compliance with all the relevant British Standards and this specification.

632 Issue two hard copies of all documentation immediately to the Engineer for comment prior to inclusion in the handover documentation.

633 Following receipt of comments, amend all documentation (including "as fitted" drawings, O&M manual documentation and system instruction drawings & manuals) and issue *three* hard copies and *three* electronic copies of all documentation. Provide electronic text documents in either Microsoft Word or Excel format, and all drawings in AutoCAD format.

640 System Instruction

641 Instruct the Employer's Representatives on the operation of the system.

642 Include a practical demonstration of the installation and equipment. Arrange the required demonstration and agree the times and dates with regard to the overall contract programme works.

643 Ensure that the "as fitted" manuals and drawings are made available for the Employer's demonstration and instruction.

700 SCHEDULE OF INSTALLER'S SUBMISSIONS

Operating and maintenance instructions for all items of equipment including: -

- Master Handsets
- Exchange Units
- Outstations as appropriate
- As wired Drawings
- BS5839pt9:2011 Design certificate
- BS5839pt9:2011 Installation certificate
- BS5839pt9:2011 Commissioning certificate
- Details of all system testing

Prepare all installations and record drawings, supply proper operating and maintenance instructions and provide adequate demonstration to and training of the client's representatives, for the system in accordance with the standards listed in clause W15.200 and the relevant sections of this specification.

END OF SECTION
