



**TENDER DOCUMENTS FOR
DESIGN, SUPPLY, INSTALLATION, COMMISSION, CERTIFICATION AND
MAINTENANCE OF
ACTIVE FIRE SAFETY SYSTEMS, WIFI-DAS AND REFUGE POINTS TO INCLUDE:**

- (a) ADDRESSABLE FIRE DETECTION & ALARM SYSTEMS; AND**
- (b) ADDRESSABLE EMERGENCY LIGHTING SYSTEMS; AND**
- (c) STANDBY EMERGENCY LIGHTING SYSTEM INSTALLATION, AND**
- (d) WI-FI and DAS DATA POINT AND MOUNTING OF AP'S,**
- (e) STRUCTURED CABLING CONTAINMENT, AND**
- (f) CENTRALISED 2 WAY COMMUNICATION EVCS (EMERGENCY VOICE COMMUNICATION SYSTEM) AND LOCAL STAIRWELL REFUGE CALL POINTS, AND**
- (g) ANY OTHER ACTIVE SYSTEMS DEEMED RELEVANT TO THE EXECUTION OF A, B, C, D, E AND F ABOVE**

**TO MONAGHAN GENERAL HOSPITAL, CO. MONAGHAN
(HSE REF. E-TENDER (OPEN PROCEDURE) FDAS, ELS, ESBL, WI-FI DAS, REFUGE AREA CALL POINTS MONAGHAN GENERAL HOSPITAL**



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CONTRACT PW-CF2 Attached

E-tender Open Procedure - Tender Documents

1. The ITT Document comprise of (Volume A):
 - i. Instruction to tenderers (“ITT”) (Part 1);
 - ii. Employers Requirement, Tender Specifications,
Drawings Schedule (Volume B) (Part 2);
 - iii. Pricing Schedule & Rates (Volume C)
 - iv. Contract (Volume D)
2. The Tender Documents (including the covering page) comprise 42 pages in total.
3. The tenderer will immediately scrutinise the Tender Documents and will promptly give notice to stephenm@fire-cert.com (the “**Contact Point**”) of any pages that appear to be missing or contain any ambiguity, discrepancy, errors or omissions. The Contracting Authority will, upon receipt of such notification, issue a clarification regarding any such ambiguity, discrepancy, error or omission. Such clarification will then form part of these Tender Documents.



INSTRUCTION TO TENDERERS (“ITT”)

INSTRUCTION TO TENDERERS

4 Introduction

- 4.1 The Health Service Executive (the “**Contracting Authority**”) has chosen the National Tender for Life Safety & Infrastructural works as the basis of this tender and has chosen FCC Cert Limited as its Contact Point for this competition.
- 4.2 Any conflict of interest or potential conflict of interest must be disclosed in writing to the Contact Point on stephenm@fire-cert.com as soon as such conflict or potential conflict becomes apparent. If any conflict occurs or potential conflict of interest, the Contracting Authority will, in its absolute discretion, decide on the appropriate course of action.
- 4.3 The tenderer will immediately scrutinise the Tender Documents and will promptly give notice to Info@fire-cert.com as (the “Contact Point”) of any pages that appear to be missing or contain any ambiguity, discrepancy, errors or omissions. The Contracting Authority will, upon receipt of such notification, issue a clarification regarding any such ambiguity, discrepancy, error or omission. Such clarification will then form part of these Tender Documents.
- 4.4 The tenderer will bear all costs in the preparation and submission of the Tender, and other actions mentioned or implied in the ITT. The Contracting Authority will not be responsible or liable for such costs, regardless of the conduct or outcome of the tendering process.
- 4.5 It is emphasised that this Invitation to tender constitutes no guarantee to purchase a specific quantity of supplies or services from a particular economic operator.
- 4.6 The Contracting Authority reserves the right to accept or reject any tender, or to annul the tendering process and reject all tenders, incurring no liability to any tenderers.
- 4.7 If for any reason, it is not possible to award the contract to the designated successful tenderer emerging from this competitive process; The Contracting Authority reserves the right to establish the contract with the next highest scoring tenderer on the basis of the terms advertised at any time during the tender validity period. This shall be without prejudice to the right of the Contracting Authority to cancel this competitive process and/or initiate a new contract award procedure at its sole discretion.

- 4.8 Where reference is made in the Tender Documents to any source, origin, patent, process, trademark, brand name, standard or norm, such reference will, on every occasion, be accompanied by the words “or equivalent”.
- 4.9 “Data Protection Laws” means all applicable National and EU data protection laws, regulations and guidelines including but not limited to Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (the “General Data Protection Regulation”), the Data Protection Act, 2018 and any guidelines and codes of practice issued by the Data Protection Commission or other supervisory authority for data protection in Ireland from time to time.
- 4.10 The Contracting Authority will be a Controller (where Controller has the meaning given under the Data Protection Laws) in respect of any Personal Data (where Personal Data has the meaning given under the Data Protection Laws) required to be provided by the Tenderer in response to the Invitation to Tender.
- 4.11 The Tenderer, as Controller in respect of any Personal Data provided by it in its Tender, is required to confirm by way of statement that all Data Subjects (where Data Subject has the meaning given under the Data Protection Laws) whose Personal Data is provided by the Tenderer have consented to the processing of such Personal Data by the Tenderer, the Contracting Authority, the Evaluation Team and the supplier of the etenders.gov.ie website, for the purposes of the participation of the Tenderer in this Competition or that the Tenderer otherwise has a legal basis for providing such Personal Data to the Contracting Authority for the purposes of its participation in this Competition.

5. Scope of work and Schedule of Rates

- 5.1 Tenderers are required to review and validate the tender Drawings in Part 2 of these Tender Documents and Volume C, and then to provide detailed design, supply, install, commissioning and maintenance for the following:
- (i) Fire Detection and Alarm System (“FDAS”)
 - (ii) Emergency Lighting System (“ELS”)
 - (iii) Standby Emergency Lighting Systems (“ESBL”)
 - (iv) WI-FI and DAS data point and mounting of AP’S
 - (v) Structured Cable Containment for the above

- (vi) Refuge Area Call System complete with 2-way Emergency Voice Communication System (“EVCS”) centralised station

(together hereinafter the “Works”) in a 24/7 operational regional hospital environment.

- 5.2 Due to the complexity, budget constraints and size of the project, the Contracting Authority may phase the project installation works depending on the hospital operations and numbers of patients in a particular department. The successful contract will liaise with each department head to arrange access to each individual department.
- 5.3 Tenderers are required to review and validate the Tender Drawings in these Tender Documents, and then to provide detailed design, supply, install and commission of all the above listed systems in a 24/7 operational regional hospital environment.
- 5.4 The Pricing Schedule will ask the tenderers to provide a price for:

The Works which include Preliminaries, Builders Work, firestopping and the project supervisor construction stage (“PSCS”) within the meaning of the Safety, Health and Welfare at Work (Construction) Regulations, 2013 (as amended) and the provision of Operation Service and replacing of defective Plant and elements within the Works in the first year following the issuance of practical completion. The work elements include:

- (i) New Fault Tolerant Peer to Peer Network & New Addressable Control Panels in Each Compartment/Department throughout the Facility. New Detection and Alarm System on new Loop Wiring within Compartments/Departments throughout the entire Facility and full maintenance and servicing options for 1 to 5 years, 6 to 10 years and 11 to 15 years respectively. Supply and installation of FDAS Computer graphics system to include a room numbering system for the entire Campus.
- (ii) New Addressable PERC LED Emergency Lighting System with computer graphics front end throughout the Campus and full maintenance and servicing options for 1 to 5 years, 6 to 10 years and 11 to 15 years respectively.
- (iii) New 230 Volt Standby Emergency Lighting Systems with Binary input circuit monitoring capabilities to include for HTM compliant 10-year

batteries, CIBSE guideline compliant clean room luminaires and appropriately fire-resistant electrical cable installations.

- (iv) The provision of all CAT6A cables, Fibre Cables, terminations, Racks, Fibre & patch Panels, UPS's installation, terminations, kits, sleeves, label's and manufacturer's warranty for the complete system. The installation of the free issue Cisco Wi-Fi AP's in the agreed locations as per the Eir Evo survey heat map. Some M&E modifications may be required on the hospital infrastructure to cater for new comms racks as indicated in the tender pricing schedule. The successful contractor shall allow for all modifications to the Electrical and fibre infrastructure to make the system fully operational.
- (v) New 2 way communication EVCS (Emergency Voice Communication System). Refuge area installation.
- (vi) Schedule of Rates

- 5.5 The works shall include the installation of the cable basket network throughout the main hospital complex including the brackets, fixings, proprietary fittings including the construction of the letter boxes through all penetrations generated from the containment installation, fireproofing of all walls where the cable and containment pass through.
- 5.6 The Price for the Works, and the Rates (the "Rates") within the Schedule of Rates will be fixed and will not be subject to any price adjustment or escalation formula to reflect variations in currency, exchange rates, taxation, cost of labour, materials, overheads and any other expense and will cover the entire cost of the provision of the works falling under the Works and Rates respectively.
- 5.7 Tenderers should note that the Contracting Authority may, in its absolute discretion, direct that elements of the Works be omitted from the Contract. Any such omission will not give rise to any claim by the tenderer for additional cost, or for loss of profit, loss of contracts or other similar losses. The Price payable will be adjusted pro rata to take account of any element of the Works so omitted.
- 5.8 If the Contracting Authority avails of any element described under 5.4 above, it will pay the tenderer the fixed price lump sum stated in the Pricing Schedule. This sum will not be subject to any price adjustment or escalation formula to reflect variations in currency, exchange rates, taxation, cost of labour, materials, overheads and any other



expense and will cover the entire cost of the provision of the services falling under the respective element or element by the tenderer.

- 5.9 Instead of availing of the Pricing Schedule, the Contracting Authority may, at its discretion, instruct the successful contractor to carry out additional work on foot of the rates in the Schedule of Rates. These rates are firm and fixed and are not subject to any price adjustment or escalation formula to reflect variations in currency, exchange rates, taxation, cost of labour, materials, overheads and any other expense and will cover the entire cost of the provision of the variations.
- 5.10 Where, in any case the successful contractor is liable to make any payment to the Contracting Authority under the Contract or otherwise, the Contracting Authority may set off any such payments due to it against any fees due by the Contracting Authority to the successful contractor.
- 5.11 Phasing of the works is important when considering the installation and due to activities in certain departments in a live Acute Hospital out of hours and lack of continuity of work in certain areas is to be included in the contractors pricing and agreed with the department heads when approaching the installation.

6. The Tender Return Date

- 6.1 The Tender will be submitted on or before 6th of November 2026 at 2:00 PM (the “**Tender Return Date**”). Tender queries can be submitted via e-tender portal up to 30th of October 2026

7. Tender Validity Period

- 7.1 By submitting its tender, the tenderer acknowledges and irrevocably accepts that its tender will remain valid for a period of 180 days from the Tender Return Date (the “**Tender Validity Period**”). Prior to the expiry of this period, the Contracting Authority may by written notice request the tenderer to extend the Tender Validity Period.

8. Submission of the Tender

- 8.1 Tenders must be submitted via the electronic postbox available on www.etenders.gov.ie. Only Tenders submitted to the electronic postbox will be accepted. Tenders submitted by any other means (including but not limited to by email, fax, post or hand delivery) will NOT be accepted.

- 8.2 Tenderers must ensure that they give themselves sufficient time to upload and submit all required tender documentation before the Tender Deadline (as defined in paragraph 6.1). Tenderers should take into account the fact that upload speeds vary. There is a maximum of 4GB for the total (combined) documents sent to the electronic postbox.
- 8.3 In order to submit a document to the electronic postbox, please note that you must click “Submit Response”. After submitting you can still modify and re-send your response up until response deadline. Tenderers should be aware that the ‘Submit Response’ button will be disabled automatically upon the expiration of the response deadline.

9. Tender Opening

- 9.1 At tender opening, tenders will first be checked on their formal compliance with this ITT.
- 9.2 Only the Tenders that pass the formal requirements as outlined in Section 20 of the ITT will be qualitatively evaluated by the Evaluation Team under the scoring method set out in Section 22 to 24 of this ITT.

10. Site visit

- 10.1 As Monaghan General Hospital, Co. Monaghan is a large 24/7 operation regional hospital, the Contracting Authority will arrange a **compulsory site visit** by appointment only. The site visit (by appointment only) will be held on **Thursday 22nd of October**. Each company’s visit will comprise a maximum of three (3) persons. To arrange a site visit contact Mr Stephen Mulholland at stephenm@fire-cert.com.
- 10.2 In relation to the Wi-Fi infrastructure upgrade, it is essential to determine and evaluate the extent of new cabling runs, cable routes, location and coverage of existing Comm’s Rooms, requirements for specialist equipment etc. along with getting an appreciation of the services being administered on the premises during the compulsory site visit.
- 10.3 Any site visit is deemed to have been based upon the tenderer, their personnel and agents indemnifying the Contracting Authority and its personnel and agents from and against all liability and upon the tenderer being responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, costs and expenses (however caused) which would not have arisen other than due to the exercise of such permission.
- 10.4 The tenderers shall make their own travelling arrangements and bear the costs, including fares, accommodation, and subsistence in relation to each and any site visit.



- 10.5 The Contracting Authority shall not be bound by any oral representations which may be made during a site visit.

11. REGISTERED CONTRACTOR WITH MANUFACTURERS

- 11.1 Tenderers must be a registered contractor with the manufacturer of the proposed

(i) FDAS;

and

(ii) ELS;

and

(iii) Standby Emergency Lighting System Installations;

and

(iv) IT infrastructure and equipment;

and

(v) Fibre cabling;

and

(vi) EVCS Refuge Area System Installations.

- 11.2 Tenders must submit evidence that it has experience with the manufacturer's installation requirements for, the proposed FDAS, ELS, Standby Emergency Lighting Systems and IT infrastructure, Refuge Area EVCS installation and as such is recognised as a registered contractor with the FDAS, ELS, Standby Emergency Lighting System, Refuge Area EVCS and Fibre cabling manufacturer(s).

12. MANUFACTURERS GUARANTEE

- 12.1 Tenderers are required to provide a manufacturers' product and system warranty regarding the FDAS, ELS, Standby Emergency Lighting Systems and IT infrastructure.

- 12.2 Tenderers must provide evidence of the manufacturers warranties of the proposed systems;

a) FDAS; and

- b) ELS; and
- c) Standby Emergency Lighting Systems; and
- d) 25 Year Manufacturers Guarantee for IT infrastructure; and
- e) EVCS Refuge Area

12.3 Manufacturers should provide evidence of its product liability insurance cover.

12.4 Manufacturers should also provide evidence of its full 25 Year Extended Product and Application Warranty for the IT infrastructure. A full System Warranty certificate for the IT infrastructure from the manufacturer direct to the HSE must be provided for the actual location covering all the newly structured cabling points. The Warranty must be directly from the manufacturer to the HSE.

13. CONTAINMENT REQUIREMENT

For FDAS, ELS, Standby Emergency Lighting Systems, EVCS Refuge Area Systems:

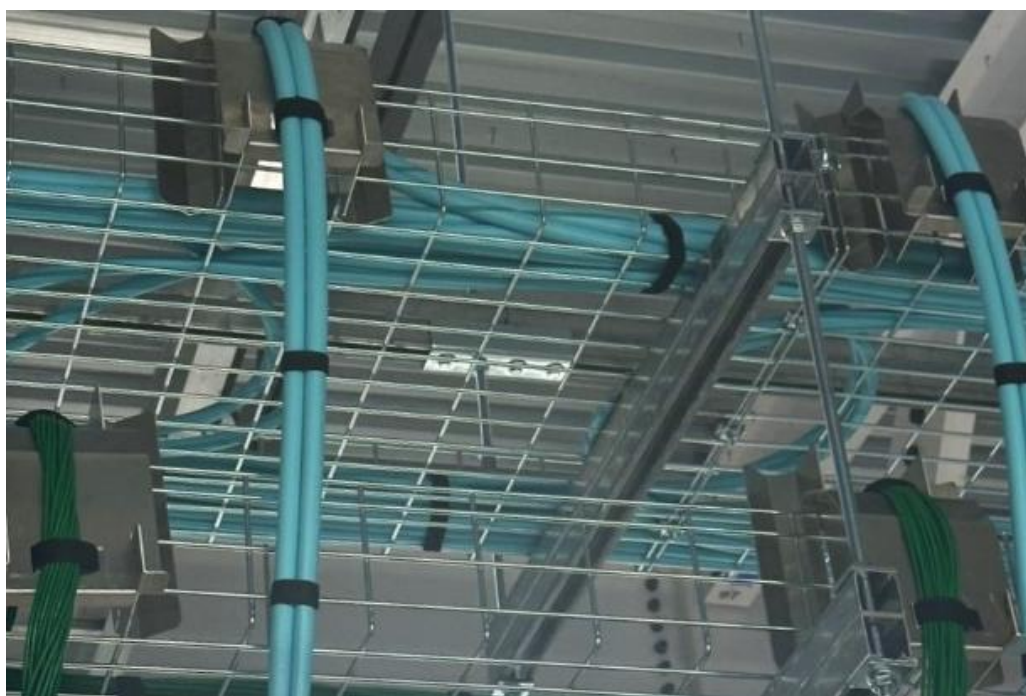
- 13.1 All containment systems for any service (fire detection & alarm and emergency lighting systems) shall be clipped every 300mm in open cable basket throughout. The cable basket shall not be installed in the inverted position in any location. Steel tie wraps shall be used to clip cables in the cable basket as per cable manufacturers' installation specifications. Non-combustible cable fixings shall not be used where these products are the sole means of cable support. 20/25mm open galvanised steel conduit containment systems shall be installed from cable basket to field device locations as per manufacturer's recommendations.
- 13.2 All containment for standby emergency lighting systems shall include for dedicated galvanised heavy gauge electrical services tray and trunking to contain adequately load sized cross-sectional area (CSA), fire resistant, B2Ca electrical cabling.

For IT infrastructure:

- 13.3 All containment systems for any service shall be in an open basket and steel containment system of the types illustrated below.
- 13.4 Where cables enter a telecom room from high level the cables must be installed on suspended cable basket which then pass to risers directly to each passive structured wiring cabinet. There must be two (2) cable baskets for each passive rack.
- 13.5 The high-level horizontal basket must be suspended on proprietary bars and installed as per manufacturers recommendations. The threaded rods must be secured to the ceiling slab and be capable of hold the weight of the maximum number of cables. The length of the Unistrut bars must, as a minimum, be the width of the cable basket plus 100mm.

- 13.6 The high level horizontal trapeze fixings must be installed as follows:
- (i) First trapeze – 50mm within the room entry
 - (ii) Intermediate trapeze – all other trapezes must be $\leq 600\text{mm}$.
- 13.7 Any vertical cable basket must be supported as per manufacturers recommendation. The bars must be secured to the wall and be centred at a minimum of 300mm apart. The supports must extend either side of the basket by a 50mm. The first and last supports must be within 50mm of each cable basket vertical radius.
- 13.8 The high-level and low-level horizontal cable basket must join the vertical cable baskets with cable basket that has been cut to a radius of $\geq 200\text{mm}$.
- 13.9 There shall be separate trays for power and telecommunication services. Where the trays cross, they must be bridged and cross at 90°. Manufactured cross sections must be fitted where containment runs cross. It is not acceptable to cut cable trays and butt them together to form a cross section.
- 13.10 Where a suspended floor is fitted into a telecom room it shall provide for a minimum depth of 250mm from the floor finish to the underside of the floor tile.
- 13.11 The suspended floor must be bonded to earth in accordance with I.S. 10101:2020.
- 13.12 Cable basket for the use of telecommunication services shall be dedicated to telecommunication services only. The cable basket shall not be shared with other services. Where it is not possible to have separate containment systems for power and data cables the single containment system shall provide the correct power separation distance by using two parallel rows of metallic fillets.
- 13.13 Cables shall be in bundles of no more than 24 and tied together with Velcro straps every 300mm.
- 13.14 All sections of containment, bends, joints, clamps, bonding etc. shall be from a single Manufacturer. It is not acceptable to mix and match containment products from different Manufacturers.
- 13.15 Where cables penetrate walls or fire barriers the containment shall penetrate completely through the wall.
- 13.16 Fire barriers shall be sealed to the fire rating of the penetrated barrier.
- 13.17 Tight/unnecessary bends in trunking/basket shall be avoided and minimum cable bend radius to be adhered to at all times.
- 13.18 Lighting and sprinkler systems shall not be impeded by basket work.

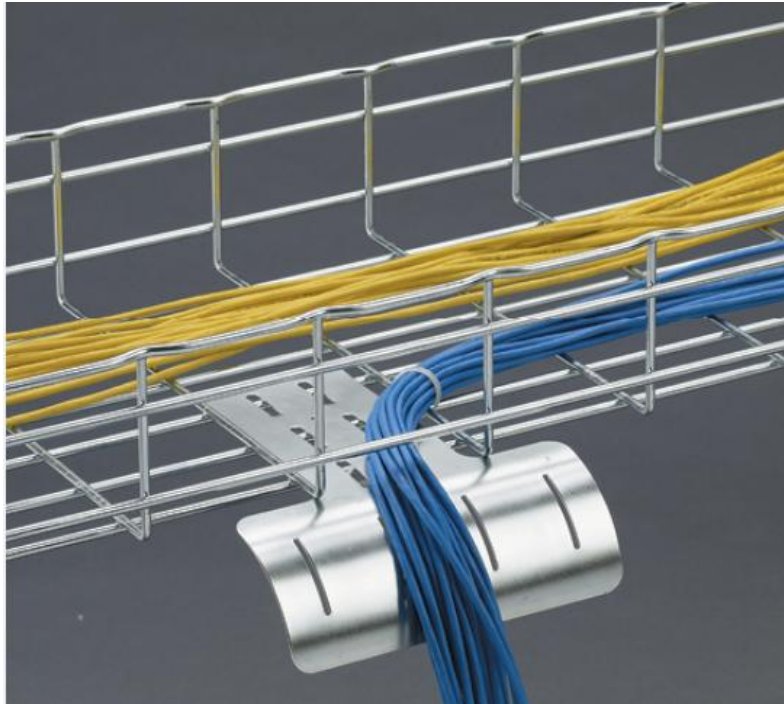
- 13.19 Cable basket shall be installed such that cables can be placed into the basket, not clipped to the underside.
- 13.20 At a minimum of every 6000mm along the length of the containment run, a person shall be able to gain access to the containment.
- 13.21 At every change in direction of the containment run a person shall be able to gain access to the containment
- 13.22 Cable basket shall be used along its entirety for bundle sizes of 7 or more cables. Where the cable basket meets trunking or copex vertical drops they shall be within 150mm of each other
- 13.23 Cable bundles of 6 or less cables should be installed in cable basket but may be installed in rigid or flexible copex. If copex is used, then it shall be 32mm in diameter, be glanded to the cable basket at the exit point and total copex run shall be $\leq 2000\text{mm}$. There shall be a ceiling fixing within 150mm either side of a change in direction with ceiling fixing metallic and shall be at $\leq 600\text{mm}$ centres. This includes the copex saddle and the screws/bolts/pins.



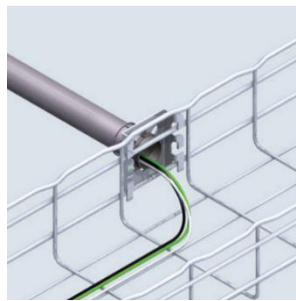
This picture depicts a 450mm double trapeze basket system suspended from the building fabric with support hangers via a treaded rod and anchor point.



This picture depicts 25mm Steel conduit suspended from the building fabric again with a hanger via a threaded rod and concrete anchor point.



This picture depicts a basket protected exit point with a protecting the cables dropping below.



These 2 pictures depict a vertical/horizontal exit from the basket system to a rear entry BESA box above a suspended ceiling tile.



Comm's Rack Structured cable containment required on both side of each rack installed with Velcro straps as illustrated on the left.

14. WI-FI & DAS Structured Cabling Installation

The structured cabling infrastructure shall have high reliability, easy to maintain and can support the applications and services of today and the future. All structured cabling installations shall comply with:

- a) Categories 6A Unshielded Twisted Pair (UTP) (Augmented Category A)
- b) Category 6A UTP cables shall conform to ANSI/TIA 568.C-2 Category 6A and ISO/IEC 11801 2017 Category 6A Class EA
- c) 4-pair 100 UTP cable shall be used.
- d) CCA Fire Rated is the minimum acceptable.
- e) RP3 POE Type 4; 802.3bt
- f) 23 AWG (American Wire Gauge)

- 14.1 The system design shall ensure that a cost-effective solution is provided without compromising any standards or safety issues, and that all single points of failure are designed out by means of route diversity and service duplication.
- 14.2 This document describes the specification for the design of the network infrastructure of both fibre and copper networks for POE services into and out of single and multiple building(s), and all interconnections between buildings.
- 14.3 The installation shall be planned and installed to provide a Remote Powering 3 (RP3) condition as detailed in ISO/IEC 14763-2 Category RP3: attachment of the remote powering equipment at a distributor is unrestricted subject to the limit $OFIC \leq 500 \text{ mA}$.
- 14.4 EN 50174-2 – Requirements – Section 4.4.1.3 – ‘The maximum stacking height in pathway systems is specified by manufacturers’ instructions. If instructions do not exist the following shall apply for pathway systems that provide continuous support (e.g. trays), the stacking height shall not exceed 150 mm’
- 14.5 The cables shall be tram lined and shall not cross over all cable bundles of 24 shall be tied with Velcro straps at 300mm centres.
- 14.6 Cables entering a riser at low level shall immediately enter a wall mounted cable basket riser.
- 14.7 Cables shall have all 4-Pairs terminated at both patch panel and outlet in accordance with the TIA/EIA 568B specification. To maintain transmission performance of the cabling system the twists in the cabling must be maintained as close to the point of termination with a maximum untwist of 13mm from the point of termination.

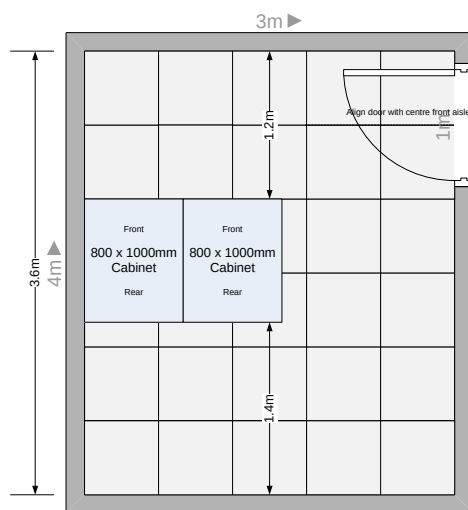
- 14.8 It is important to note that all data rooms are for the sole occupancy of ICT and their associated voice and data distribution equipment. It is not permissible for other parties to store or install equipment within these rooms.
- 14.9 The system set has been standardised for manufacturers recommendations. This product selection shall be of the highest degree of reliability, quality and performance. By standardising on the product set a standard warranty for voice and data has been set for all buildings within HSE. To this effect the standardised voice and data products specified within this document must be put forward by the tenderer.
- 14.10 All installation work must be covered by a manufacturer's warranty. To ensure that this happens only approved manufacturers authorised integrators can be used.
- 14.11 This document shall be used in conjunction with:
- a) Bonding best practices
 - b) Cable pulling best practices.
 - c) Copper testing best practices
 - d) Ducting best practices
 - e) Fibre inspection and cleaning best practices.
 - f) Fire detection in Comm's rooms best practice
 - g) Fire stopping best practices.
 - h) Single mode fibre best practices
 - i) Patch panel installation best practices
 - j) Patching best practice
 - k) Power segregation best practices
 - l) Single mode fibre best practices
- 14.12 The fibre backbone shall have a minimum of two different fibre trunks.
- 14.13 Each fibre trunk must be capable of servicing the load of the other trunk in the event of a trunk failure.
- 14.14 Fibre trunks must not share the same route.
- 14.15 The fibre must be linked to the server room with a single 12 core OM3 tight buffered fibre optic cable.
- 14.16 Have a fibre patch panel with 12 off LC connectors (4 duplex) at each end.
- 14.17 Consideration of the telecoms room is fundamental to all other aspects of the building design. It is critical that the telecoms room is designed correctly, and consideration given to:
- a) Position

- b) Space
- c) Layout
- d) Lighting
- e) Ventilation
- f) Power
- g) Security
- h) Routing
- i) False floor
- j) Ceiling void
- k) Cable management

14.18 Calculation of floor space is dependent on the purpose of the data room. All calculations shall be based on an interconnect channel design.

14.19 Interconnect with Switches – A design where the data room only houses switches and patch panels. The switches patch directly into the distribution patch panel.

14.20 For all other types of data room general rules can be applied. It must be noted that these rules only apply as a minimum as the room must meet the requirements of the HSE Estates Authority and the telecommunication design for the building.



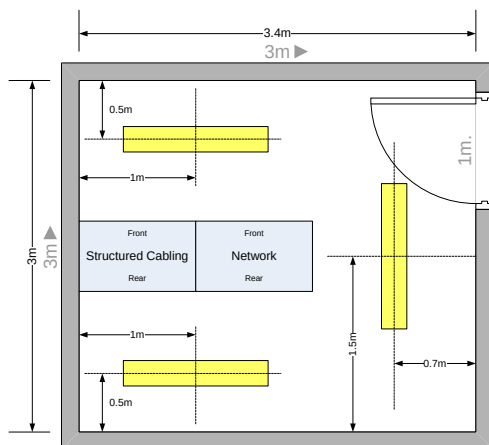
Above example shows 1000mm deep cabinet typical room layout

14.21 For data rooms with multiple cabinets the structured wiring and the switches must not share the same cabinets. This is important, as there may be a future requirement to move to chassis-based switches and a UPS may be fitted. Mixing the switches and structured wiring patch panels reduces this ability to expand.

14.22 Lighting shall be measured 1m above the finished floor in the centre of the cabinet aisles. The luminance shall be a minimum of 450lx in the horizontal and 200lx in the

vertical plane. Diffusers shall be used to ensure an even spread of light throughout the length and width of the aisles. Spot lighting must not be used to illuminate the aisles.

- 14.23 Where there is no suspended ceiling, the light fixtures must be LED super-efficient fitting with Presence detection in each comms room. The fitting is to be suspended below the level of the cable containment on solid suspension rods to prevent swaying when air coolers are running. (suspension chains or catenary wires will not be accepted)



Typical lighting layout for comms room

- 14.24 Where free cooling is not deemed adequate by IT Services it must be provided in all Comm's Rooms by supplemented by a wall mounted air conditioning unit.
- 14.25 The air conditioning unit must be rated at 5kW per active cabinet.
- 14.26 The cooling system shall be tested and commissioned prior to the installation of active equipment. The active equipment covers, but is not limited to, UPS, network switches etc.
- 14.27 The cooling system shall be available of a 24-hour 365-day basis.
- 14.28 All doors that have direct access to a Comm's room must have a suitable security lock fitted with a swipe card control door entry latch to match the existing hospital door access control systems. To override the system in the event of a system failure an emergency door exit system must be fitted.
- 14.29 The door of each Comms Rooms shall be a minimum of 926mm wide and 2040mm high and hinged to open fully without interfering with the useable space within the Comms Room.
- 14.30 Comms Rooms should not have exterior windows, as this will increase the heat load in warm weather.

15. COMM'S ROOM POWER REQUIREMENTS

- 15.1 Each Telecom room must have a local distribution board and sufficient breakers for:
- a) HVAC unit(s)
 - b) UPS
 - c) 13A twin sockets
 - d) Lighting
 - e) 4 spare breaker positions
- 15.2 A local UPS distribution board for each Comm's and Server Room
- a) 1 PDU To be fed from the UPS
 - b) Sufficient breakers for
 - c) PDUs
 - d) 4 spare breaker positions
 - e) Comm's Racks shall be fitted with a local rack mounted UPS
- 15.3 Two commando sockets for each rack (applies to network and structured cabling cabinets)
- a) To be fed from the UPS
 - b) 240v 32A rating
 - c) Command's plug termination
- 15.4 For high-level containment the commando sockets must be directly above the cabinet and mounted on the containment with a suitable bracket – one aligned to the rear left-hand side and one to the rear right-hand side of the cabinet.
- 15.5 For suspended floor low level containment, the commando sockets must be directly underneath the cabinet– one aligned to the rear left-hand side and one to the rear right-hand side of the cabinet.
- 15.6 Each commando to have its own circuit breaker.
- 15.7 Two PDUs for each rack (applies to network and structured cabling cabinets)
- a) 240v 20amp c-type rating
 - b) 10 WAY 3 pin outlets
 - c) Unswitched
 - d) Managed with surge protection
 - e) Commando's plug termination

- 15.8 Comm's Rooms shall have a minimum power rating of 5kW, or for larger comm's rooms where required the room shall have a power rating of 10kW or 15kW dependant on rack numbers and cooling required and deemed necessary.
- 15.9 All cabinets must be separately earth bonded using a minimum of 6mm earthing cable back to a clean telecommunication rated earthing point. Bonding must be in accordance with electrical regulations I.S. 10101:2020.

16. COMMS CABINATES

- 16.1 Within the telecommunication rooms and wiring closets, cabinet(s) are required to house the termination of the copper distribution cabling, inter building/campus fibre optic cable and active I.T. hardware.
- 16.2 All cabinets must be equipped as follows:
- a) 47U high.
 - b) 1000 x 800mm unless otherwise specified
 - c) Vertical cable management
 - d) All metallic panels and detachable parts to be bonded.
 - e) Cabinets to be bonded to the earth system.
 - f) Left-hand and right-hand side panel at end of each row
 - g) Overhead cable pathway
 - h) If comms room has raised floor, then the frame is to be fixed directly to the comms room floor
 - i) At least 1 heavy duty shelf and 2 cantilever (front mounting) shelves should be installed in at least 1 of the cabs.
 - j) The cabinets must be lockable.

17. WIRELESS AP INSTALLATION

- 17.1 It must be noted that suspended ceiling outlets shall be used at the terminal device in the ceiling void and patched to the installed device on the suspended ceiling.
- 17.2 Wireless APs will be installed on the suspended ceiling or exposed slabs at the AP is installed a Basa box and dual face plate will be installed, and the AP shall be patched by the contractor recording the port number and AP point details which will be submitted to HSE Networks on completion of each area.
- 17.3 Each AP shall consist of 2 qty CAT 6A shielded jacks in a 24-port patch panel mounted in the telecom room rack, 3 qty printed label – patch panel, face plate and field device.

18. PASS/FAIL CRITERIA

18.1 Tenderers who do not submit a completed and duly signed Pricing Schedule in the form set out Volume C of these Tender Documents (without amendment or qualification) SHALL be excluded from this competition.

18.2 Tenders must attend the compulsory site visit on the **Thursday 22nd of October** or SHALL be excluded from this competition.

18.3 Tenderers must complete **the ESPD Questionnaire enclosed** (Volume A) and the Qualification Questionnaire contained in Section **18.11** to this Document. Applicants should note the following conditions:

- a) All questions must be completed in full and without reference to other documents or other parts of the Qualification Questionnaire.
- b) All questions should be answered with relevance to the subject matter of this competition. For the avoidance of doubt, it is emphasised that the information requested in the Qualification Questionnaire is aimed solely at determining the suitability and choice of Applicants for entry to qualitative marking stage.
- c) Where a 'Rule' is associated with a particular criterion, Applicants must satisfy the requirements of the rule in order to remain eligible for consideration in the competition.
- d) Applicants are permitted to add lines to the pro-forma tables and boxes set out within the Qualification Questionnaire if required.
- e) The Qualification Questionnaire must be completed in English or Irish and where copies of original documents are provided in languages other than English or Irish, a complete and accurate English translation should be provided, or the documents will not be considered during the evaluation process.
- f) All financial information should be denominated in euro (€), except where financial information is being provided in a certified or audited supporting document such as a set of financial statements in which case it is sufficient for the information to remain in its original currency.
- g) Failure to provide a sufficient level of detail or to explain adequately any relevant matters may result in such data or information not being taken into account during the evaluation process.

18.4 Applicants for qualification may include individuals, partnerships, limited companies, groupings or any combination of the foregoing with or without legal personality. However, a grouping if successful will be required to establish legal personality in order to enter into the Contract.

18.5 Applicants are reminded that they may rely on the resources of other entities in order to establish the suitability requirements on condition that they can prove to the

satisfaction of the Contracting Authority that they will have these resources at their disposal when necessary.

- 18.6 If the application is from a consortium / joint venture, Applicants must ensure that all the relevant information is provided and where necessary provide the information requested separately for each party. The consortium must appoint a single supplier who will assume overall responsibility for delivery, and who is authorised to sign a contract on behalf of all consortia members. The Contracting Authority will not act as an arbitrator between members of project consortia.
- 18.7 Applicants are strictly prohibited from discussing any aspect of their application to the Qualification Questionnaire with other Applicants or otherwise exchanging information or colluding in respect of the project. Any Applicant who fails to comply with this requirement may be disqualified.
- 18.8 The Contracting Authority is not responsible for and will not pay for any expense or cost incurred or loss suffered by an Applicant in the preparation or submission of its Application or otherwise. Further, the Contracting Authority is not responsible for any travel or accommodation costs incurred by the Applicant. Each Applicant is fully responsible for the entirety of all expenses and/or costs it incurs in the presentation or submission of an application or in participating in this process and competition.
- 18.9 While not being obliged to seek clarifications from Applicants, The Contracting Authorities reserves the right, at their absolute discretion, to ask Applicants for clarification or elaboration of their applications to assist in their evaluation of applications.
- 18.10 However, it is stressed that the Contracting Authority will not seek clarification where any of the pass requirements set out in the Qualification Questionnaire have not been met. Therefore, Applicants should pay particular attention to ensure that their applications contain all the required information as even small administrative errors (such as failure to sign or date a declaration) will not be clarified by the Contracting Authority where the required information forms part of the pass requirement.

18.11 Qualification Questionnaire

QUALIFICATION QUESTIONNAIRE

REF	PASS/FAIL CRITERIA	PASS REQUIREMENT
A1	Applicant Summary	Refer to ESPD Enclosed – To be completed



Invitation to Tender – Monaghan General Hospital, Co. Monaghan

		Applicants must complete the ESPD Questionnaire in full. If the Applicant is a grouping or relying on subconsultants to provide the service (or part thereof), then a separate questionnaire must be completed for each group member and sub-consultant.
A2	Tax Compliance	Note: Applicants are required to complete a Self-Declaration Form (A5) . Applicants should note that if their Tender is successful, they will be required to provide the evidence that was self-declared prior to contract award. Refer to individual rules regarding members of a grouping.
A3	Turnover	
A4	Insurance	
A5	SELF DECLARATION OF FINANCIAL AND ECONOMIC CAPACITY	Applicant must complete, sign and date this Declaration. Non-compliant Applicants under any of the headings will be automatically disqualified.
A6	QUALITY ASSURANCE MEASURES	Applicants must complete this section. If the Applicant is a grouping, then a separate questionnaire must be completed for each group member.



A2 TAX CLEARANCE CERTIFICATE DECLARED BY SELF-DECLARATION

Weighting: Pass/Fail only

Pass requirement: Applicants must complete the self-declaration (A5) providing information regarding their tax compliance. This applies to all group members.

A3 FINANCIAL CAPACITY DECLARED BY SELF-DECLARATION

Weighting: Pass/Fail only

Pass requirement: Applicants must declare in the self-declaration (A5) information regarding their financial standing and viability. The requirements are as follows:

Annual Turnover: Applicants must meet or exceed the specified minimum turnover per annum (Excluding VAT) for each of the three most recent financial years as set out below.

Minimum Turnover Required per annum (Ex. VAT)

€4,000,000.00

Note 1: In the case of the Applicant being a grouping, this condition may be satisfied by the group members as a whole, or by reliance on the lead Applicant. Where group members are relying on the lead Applicant's financial capacity, self-declaration / evidence will only be required of the lead.

Note 2: In the case of firms more recently established evidence of pro-rata turnover will suffice.

A4 INSURANCES DECLARED BY SELF-DECLARATION

Weighting: Pass/Fail only

Pass requirement: Applicants should complete the self-declaration (A5) providing information regarding the insurances in place and are asked to note that the following levels will be required for the Applicant being awarded this Tender. This applies to all group members.

Insurance Type	Required Level
Public Liability	€6.5m
Product Liability	€6.5m
Employers Liability	€13m
Professional Indemnity	€6.5m

A5 SELF DECLARATION OF FINANCIAL AND ECONOMIC CAPACITY



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TAX CLEARANCE		Please indicate your answer by marking "X" in the relevant box	
		Yes	No
(A) I confirm being tax compliant with the Irish Revenue Commissioners and that our tax affairs are in order.			
Do you grant The Contracting Authority permission to verify your tax cleared position online via www.revenue.ie ?			
Information required using new tax clearance certificate status adopted in 2016			
Applicant Name:			
Applicant PPSN /Tax Reference Number:			
Tax Clearance Access Number (TCAN):			
OR (B) I confirm that I have a Tax Clearance Certificate details as follows:		Registration Number:	
		Certificate Number:	
OR (C) I confirm that I currently have applied for a Tax Clearance Certificate that will be made available		Yes	No
TURNOVER			
I confirm that we have the requisite turnover applicable to be considered for the Tender:			
Year	2025	2024	2023
Turnover	€4,000,000	€4,000,000	€4,000,000
I confirm that I will provide evidence of turnover when requested.		Yes	No
Note 4: In the case of sole traders of partnerships this condition may be satisfied by a letter of confirmation from the principal or senior partner.			



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INSURANCES

I confirm that we have the following insurances in place:

Insurance Type	Level in Place	Details of Any Excess	Expiry Date
Employers Liability	€	€	
Public Liability	€	€	
Product Liability	€	€	
Professional Indemnity	€	€	

AND

I confirm that if successful, where the levels required under the tender are higher than those currently in our possession, I will be in a position to put the required forms and levels of insurances required in place.

Yes

No

AND

I confirm that I will provide the following promptly on request at any time prior to the award decision being made:

- Evidence of insurances in place **or**
- Letter from Insurance Broker confirming that the required levels could be put in place if successful

Yes

No

Signed:

Position:

Dated:

A6 QUALITY ASSURANCE MEASURES

Weighting: PASS/FAIL

Minimum requirement to remain eligible in the competition: Applicants must provide information on the measures in place to ensure the delivery of a quality service, for example by way of an accredited system, or an equivalent in-house quality control process or system.



(A) Third-Party Certification	
If third-party certified, please provide details of:	
Date of certification	
Name of certification body	
Scope of certification	
Please set out high level detail on your quality assurance measures	
Date of first certification	
Date of most recent renewal	
Name of person responsible for quality management	
Certificate	
Tick if attached	
(B) Internal Policy	
If you don't have a 3 rd party certified system but do have an in-house system, please provide details of the processes and procedures for ensuring quality assurance in existence.	

19. CONDITION PRECEDENT

19.1 It is a condition precedent to the award of the Contract that the successful Candidate (and all Sub-Contractors) will provide:

- a) A C2 or Tax Clearance certificate or with a non-resident contractor, a statement of suitability on tax grounds from the Revenue Commissioners of Ireland;
- b) Evidence showing it complies with the registered employment agreement (Construction Industry Pensions Assurance & Sick Pay scheme);
- c) Contactor's all Risk insurance to the full value of the Works plus fifteen percent for any one claim or event with an excess limit no greater than the amount specified in the Appendix to Tender;
- d) Public Liability Insurance cover: €6.5 million each and every claim with an excess limit no greater than the amount specified in Contract Schedules;

- e) Product liability cover: €6.5 million each and every claim with an excess limit no greater than the amount specified in Contract Schedules;
- f) Employers Liability Insurance cover: €13 million each and every claim with an excess limit no greater than the amount specified in Contract Schedules;
- g) Professional indemnity insurance: €6.5 million in the aggregate with an excess limit no greater than the amount specified in Contract Schedules; and
- h) Current letter from the tenderer's bank confirming that the tenderer is financially viable and has good financial relationship with the Bank.

20. EVALUATION TEAM

20.1 The evaluation team will consist of the following:

- a) **Representative from Monaghan General Hospital;**
- b) **Representative from HSE Capital & Estates;**
- c) **Representative from FCC Fire Cert Ltd & Q-Solve;**

21. SCORING MATRIX

21.1 Compliant tenders that meet the pass/fail criteria will be qualitatively assessed by their responses as required under Section 22 – 24 hereunder by the evaluation team in accordance with the below scoring matrix:

Criteria	Weighting	Sub-weighting	Minimum Score
QUALITY CRITERION	70		
Criterion A – Project Assessment		20	8
22.1 - Question 1			
Criterion B – Execution Methodology		30	12
22.2 - Question 2			
Criterion C – Offering		20	8
22.3 – Question 3			
Price	21		-
Prelims		3	-
FDAS		3	-
EL		3	-
Static EL		3	
Wi-Fi & DAS		3	
EVCS Refuge Area Call System		3	
Builders work and Firestopping		3	
Schedule of Rates	9		[]
Total	100		

21.2 Tenderers not achieving the stated minimum qualifying score for award criteria as outlined in the Table above will be eliminated.

22. Methodology

22.1 Criterion A – PROJECT ASSESSMENT

Not to exceed a maximum five (5) A4 pages - front size 10 point - to include graphics if deemed beneficial by the Tenderer. All text, graphics, charts and diagrams must be legible.

Q1

A written submission explaining the Tenderer's appreciation and understanding of the regional hospital project and any specific issues they deem most relevant to the successful delivery of their service and the project.

The Tenderer must address the challenges presented by the project and demonstrate an understanding of how the Project can be executed. Tenderers shall provide details as to how it proposes to integrate its proposed CAT6A and Fibre with the existing structured cabling distributions systems in accordance with the National Cabling Standards Document and the manufacturers guidelines.

Tenderers shall also provide details as to how it proposes to complete the designated Refuge Area and 2 way "EVCS" Emergency Voice Communication System in accordance with IS3218 latest standard, IS10101:AC2020 National Rules for Electrical Installations and BS 5839 2003 Part 9.

General issues not related to the project which the Contracting Authority considers to have little relevance will not be considered.

22.2 Criterion B – Execution Methodology

Not to exceed a maximum of ten (10) A4 pages - font size 10 point – graphics and project programme/implementation charts/diagrams if deemed beneficial by the Tenderer may be additional. All text, graphics, charts and diagrams must be legible.

Q2

The Team

Provide a written submission with supporting organisation chart(s) explaining the make-up of the team (indicating and describing the Tenderer's Project Lead, detailing the ability of the team and each member (both "Key Personnel" and supplemental staff) to effectively deliver the Service and achieve the Client's objectives for this project.

Programme Of Works

Tenderers shall detail how they propose to carry out the project, from design to practical completion, including RAMS', Infection Control, Day/ Night and Weekend works with project timelines for all system elements outlined in the tender above.

Provide a proposed programme of works to indicate flow of work and demonstrate how the contractor will minimise the disruption to the programme should continuity of work within a department be disrupted due to emergencies or ICP requirements.

The contractor will also indicate how they would phase the works over the contract period, part commissioning and handover of work phases, provide and demonstrate their ability to maintain the operation of the existing Hospital life safety systems during the upgrade phases, project critical paths and key milestones but adhere to all current health and safety and infection control guidelines.

General issues not related to the project which the Contracting Authority considers having little relevance will not be considered.

22.3 Criterion C – Experience/Products/Warranties/Maintenance

Not to exceed a maximum Six (6) A4 pages - font size 10 point - to include graphics if deemed beneficial by the Tenderer. All text, graphics, charts and diagrams must be legible. Manufacturer Warranty information/proofs can be additional to the above page limit.

Q3

A. Provide detail of three previous similar projects completed in the last 8 years.

B. Outline the products/protocols proposed for each element of the works FDAS, Refuge System, ELS, Standby Emergency Lighting Systems and IT infrastructure. Provide a manufacturers' product and system warranty regarding the FDAS, ELS, Standby Emergency Lighting Systems, IT infrastructure and Refuge Area EVCS (Emergency Voice Communication System) and provide evidence of its product liability insurance cover.

Provide evidence of a full 25 Year Extended Product and Application Warranty for the IT infrastructure. Confirmation that A full System Warranty certificate for the IT infrastructure from the manufacturer direct to the HSE must be provided for the actual location covering all the newly structured cabling points. The Warranty must be directly from the manufacturer to the HSE.

C. Provide a written submission to demonstrate how the tenderer proposes to operate and maintain the systems over an Operation Service Period of 5 years, 6 to 10 years and 11 to 15 years.



General issues not related to the project which the Contracting Authority considers to have little relevance will not be considered.

23. Price

- 23.1 The sub-award criterion for Elements FDAS, EL, Static EL, Wi-Fi/DAS and Refuge Point EVCS, Prelims, Builders work and firestopping shall be assessed in accordance with the following formula:

$$\frac{[\text{lowest price}]}{[\text{tender price}]} \times 3 = \text{score}$$

24. Schedule of Rates

- 24.1 The criterion Schedule of Rates will be assessed in inverse proportion to the maximum score, which will be allocated to the lowest aggregate rate not previously eliminated.
- 24.2 The evaluation team will use the following formula to score each tender:

$$\frac{[\text{lowest aggregate Rate}]}{[\text{tender aggregate Rate}]} \times 9 = \text{score}$$



EMPLOYER'S REQUIREMENTS

Employer's Requirements

The Employer's Requirements consists of:

- A. Information regarding the existing systems within the Facility
- B. Tender specifications
- C. Tender Drawings

The successful tenderer will have to review these documents and then make it their own. The Contracting Authority accepts no liability for the accuracy of the above documents. The purpose of the documents is to detail the Employer's requirements.

A. INFORMATION REGARDING THE EXISTING SYTEMS WITHIN MONAGHAN GENERAL HOSPITAL

A.1 Fire Detection and Alarm system ("FDAS")

1.1 The existing FDAS (Fire Detection and Alarm System) throughout the hospital campus consists of:

- (a) Circa 426No. Gent Vigilon protocol device to include:
 - Circa 366No. 3400/34000 series devices – Circa 78% of existing Gent Vigilon installation.
 - Circa 90No. S-Quad series devices - Circa 22% of existing Gent Vigilon FDAS installation
 - Circa 190No. Sounders.
- (b) Circa 85No. Hochiki protocol devices.
- (c) A total of Circa 685No. Fire Alarm device installations observed throughout the hospital campus.

1.2 The following issues are noted:

- (a) Undercroft area observed with no evidence of FDAS coverage.
- (b) Significant number of voids observed with no evidence of FDAS coverage.
- (c) Mixture of Addressable Hochiki and Addressable Gent protocol device installations observed throughout the campus resulting in Sounder output ambiguity.

- (d) Non-compliant fire detection spacings observed within the main hospital.
- (e) FDAS Radial circuits present on existing FDAS systems.
- (f) Detectors in some locations are not correctly sited or spaced along escape routes.
- (g) No early fire alarm detection and warning in areas observed without fire detection coverage and/or poorly spaced fire alarm devices.
- (h) Additional callout costs due to the age of existing FDAS Systems.
- (i) Additional Maintenance costs due to age of existing FDAS Systems.
- (j) Additional Parts replacement costs due to age of existing FDAS installation.
- (k) Additional cost implications present due to environmental requirements to ensure controlled disposal of radioactive “Ionisation” detector heads.
- (l) Additional FDAS detection installation required in risers/ mechanical-electrical cupboards/ storage areas/ stairwells/ ceiling voids and escape routes to bring existing systems onsite to L1 coverage.
- (m) Unable to conclusively determine Decibel Levels on existing FDAS systems onsite.
- (n) Existing Cause and Effect Strategy cannot be conclusively determined.

2 **Control Panel & System Overview**

2.1 The existing FDAS (Fire Detection and Alarm System) consists of:

- (a) 2No. 4 loop Nodes Main Hospital Building – Gent Vigilon Active fire alarm panels.
- (b) 2No. Node FARPS Main Hospital Building – Gent Vigilon Fire Alarm Repeater Panels.
- (c) 1No. 1 Loop Node External Maintenance Building(s) – Advance MxPro 4 Fire Alarm Panel.

2.2 It was observed that the external buildings FDAS (Fire Detection and Alarm System) has been replaced Circa 2013 and upgraded to Advance MxPro 4 protocol protection to include Hochiki devices, however it was observed that the installation is standalone, with FAP (Fire Alarm Panel) located at reception area.

2.3 It was further observed that the Main Hospital building FDAS (Fire Detection and Alarm System) protection is provided by 2No. Main Gent Vigilon FAP'S (Fire

Alarm Panels) to include 2No. FARP's (Fire Alarm Repeater Panels) located at main reception, nurse station and main circulation areas.

2.4 The following issues are noted:

- (a) Pyro and MICC cabling installations within elements of the hospital – Circa 55% of cabling infrastructure.
- (b) Firetuff PH30 fire resisting cabling in majority of campus buildings – Circa 40% of cabling infrastructure.
- (c) Elements of PH120 fire resisting cable in previously upgraded areas – Circa 5% of cabling infrastructure.
- (d) Mixture of 4 Core and 2 Core Fire Alarm cabling observed across campus.
- (e) Over reliance on junction box installation also observed across campus.
- (f) Evidence of existing FDAS (Fire Detection and Alarm System) cabling infrastructure is varying in age ranging from 5 years to 20+ year old installation.

2.5 The proposed FDAS (Fire Detection and Alarm System) upgrade works to include for maintaining and utilising the upgraded external building cable infrastructure and containment, where possible, and to provide a new Pier to Pier network to extend and enhance the fire detection coverage in full compliance to IS:3218:2024.

A.2 **Emergency Lighting System ("ELS")**

1.1 The existing ELS (Emergency Lighting System) installations vary in age ranging from 4 years to 25+ year old installation comprising of:

- (a) Conventional Self-Contained ELS tested via CTU's (Central Test Units).
- (b) Addressable PERC Hochiki Firescape ELS System

1.2 The existing emergency luminaires consist of:

- (a) Single Fluorescent Bulkheads luminaires.
- (b) Combination fluorescent fitting luminaires.

- (c) PL lamp type luminaires.
- (d) LED Luminaires.

1.3 The existing conventional ELS installations consist of Circa 300No. emergency luminaires which accounts for Circa 25% of all Emergency Lighting on campus. The number of CTU (Central Test Unit) test points could not be conclusively determined; however, all CTU test points are located within dedicated Electrical DB's (Distribution Boards)/ Electrical Risers.

1.4 Locations of conventional ELS include:

- (a) Main Hospital Basement Area.
- (b) Ward 3
- (c) Theatre Plant room(s)
- (d) Water Treatment Plant Room
- (e) Cardiology Prefab
- (f) Reception/Front Entrance Area
- (g) Physio
- (h) Stairwell No.1 and Stairwell No.3
- (i) CSSD
- (j) ENT
- (k) Theatre
- (l) Ward 3
- (m) Canteen
- (n) Lift Shaft(s) and Lift Motor Room Areas.

1.5 The existing Addressable Self-Contained PERC ELS System consists of Circa 600No. luminaires which accounts for Circa 75% of all Emergency Lighting on campus.

1.6 Addressable Hochiki FireScope PERC ELS installed from Grd Floor to Second Floor West Wing area to include for 4No. controller installations

1.7 Locations of Addressable PERC ELS include:

- (a) Maternity OPD
- (b) Diamond Ward

- (c) Conference Room area
- (d) Radiology.
- (e) Ward 2
- (f) Pharmacy
- (g) Ward 1
- (h) OPD
- (i) Minor Injuries

- 1.8 It was observed that significant elements of Addressable PERC infrastructure installation fails to include for IS3217 compliant containment.
- 1.9 It was further observed that elements of the Addressable PERC luminaire installations are 10+ years old.

A.3 **Standby Emergency Lighting System (“SELS”)**

- 1.1 Currently there is no Standby Emergency Lighting coverage provisions for critical surgical area of the hospital (Theatre)

A.4 **Structured Cabling (ICT)**

- 1.1 Monaghan General Hospital (MGH) utilizes a range of Information and Communication Technology (ICT) systems to support its clinical and administrative functions, aiming for efficiency, patient safety, and integration with the broader healthcare network. Key areas include data management, network infrastructure, and specific clinical applications.
- 1.2 MGH's ICT department is responsible for maintaining the hospital's network, ensuring authorized access to data systems, and implementing data protection measures to ensure data integrity and security. They also handle backup and recovery procedures and perform routine housekeeping on servers.
- 1.3 The hospitals ICT infrastructure has developed over the past two (2) decades with certain upgrades and extensions with consist of multiple different cable solutions that no longer are sufficient to support the POE technologies that are coming online to support the hospital's needs.

- 1.4 The HSE strategy is looking for a seamless, safe, secure and connected digital health services as key to the delivery of better health outcomes. A digitally enabled workforce and workplace, underpinned by modern, secure, mobile connectivity is key to the delivery of this strategy.
- 1.5 The approach is to install the Wi-Fi and containment as specified to implement the HSE strategy for WF-Fi access to the newly procured medical equipment that is Wi-Fi enabled but will support future structured cabling upgrades to the Enterprise Wireless LAN and enterprise cabled systems. The wireless services delivered under the plan are:
 - (a) Staff Wireless
 - (b) Public Wireless for Patient and Guest Access
 - (c) Medical Devices Wireless
 - (d) IOT Wireless (example smart TV's)
 - (e) Voice for Wireless
- 1.6 The NDC core component is complete, Vendor Eir Evo, Technology Solution CISCO Enterprise WLAN Solution already procured.
- 1.7 The schedule of Comm's rooms shows the existing and proposed Comm's rooms for the hospital campus. This is a live environment and contract works will be carried out in live conditions. The existing Comm's Racks will have to be cabled and terminated in the live environment with some of the comm's rooms having restricted space.
- 1.8 It is envisaged that the works upgrades will be segregated with full dust control in the live environments and the contractor is to include for all protections against outages of the live enterprise systems within the hospital.
- 1.9 Programming of the contract works within the live Comm's rooms with be carried out in conjunction with the Local Estates and IT Networks teams agreeing times of access and Rack access for the execution of the contract works.

A.5 **Disabled Refuge ("EVCS")**

- 1.1 Currently there is no EVCS or dedicated Disabled Refuge areas on campus.

B	TENDER SPECIFICATIONS
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B.1 Fire Detection and Alarm system (“FDAS”)

- 1.1 The new addressable FDAS must be designed in accordance with:
 - (a) I.S.3218:2024;
 - (b) National Guidelines for the Prevention of Nosocomial Invasive Aspergillosis During Construction/Renovation Activities;
 - (c) HSA Guidelines Leaflet - Summary of Key Duties under the Procurement, Design and Site Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations, 2013;
- 1.2 The Works shall be installed in the areas shown on the enclosed Tender Drawing schedule.
- 1.3 The design shall ensure that a suitable addressable open protocol L1 fire detection and alarm system shall be provided throughout Monaghan General Hospital in full compliance with IS 3218 (latest edition).

2 FDAS Architecture for Monaghan General Hospital

Control Panel & Network installation:

- 2.1 The design shall ensure that the installation comprises a “fault tolerant” network throughout the facility in a loop architecture using appropriate PH120 Enhanced Fireproof cabling. The proposed system is to be a full “pier to pier” network.
- 2.2 A Fire Alarm Control Panel Node (No. of loops depending on below loop architecture) shall be provided to each department/compartment connected to the said Fault Tolerant Network. Fire Alarm Control Panel Node(s) (No. of loops depending on below loop architecture) shall be provided to all areas as shown on enclosed tender drawings connected to the said Fault Tolerant Network.

Installation of Loop Wiring and devices within Department/Compartment to bring the level of coverage to category L1 (I.S.3218:2024 latest edition)

- 2.3 The design shall ensure that the installation comprises of loop cabling architecture comprising all devices/interfaces wired within individual fire compartments as

indicated on the enclosed drawings with each loop connected back to the relevant control panel Node.

Sounders & Beacons

- 2.4 The design shall ensure that all sounder bases shall be loop powered. The sounders shall have adjustable volume control and comply with the frequency requirements of IS3218 latest edition. Each sounder shall be suitable for connecting directly to the detector loop. All patient access areas to achieve 45dB. Staff access areas shall achieve a minimum of 65db or 5dB above ambient noise level, whichever is greater. Ambient noise is defined as any noise sustained for a period of 30s or more. Sounders shall comply with EN 54: part 3 and visual alarms shall comply with EN 54: part 23.
- 2.5 Beacons/Strobe Units shall be provided to all escape corridors and shall be addressable looped powered units with high intensity LED's. Fire alarm strobes shall be provided with red lens covers and shall be synchronized.
- 2.6 The design shall ensure that the installation achieves the level of coverage to Category L1 I.S.3218; (Latest Edition).

3 **Technical Standards**

- 3.1 2.1 Confirmation of compliance to these standards must be made within all tender replies:
 - (a) Irish Standard 3218:2024 latest edition "Category L1 fire detection and alarm system";
 - (b) Technical Guidance Document B 2024
 - (c) NHS Health Technical Memorandum 05-02: "Guidance in support of functional provisions for healthcare premises" and HTM 05-03 'Fire detection and alarm systems'
 - (d) I.S. 10101:2020 National rules for Electrical Installations, by the National Standards Association of Ireland
 - (e) I.S. EN 54-13:2017:2024, Fire detection and Fire Alarm Systems

4 **Containment**

- 4.1 The tenderer shall be responsible for the supply and installation of complete cable containment installations to ensure a complete working installation.

- 4.2 The tenderer shall determine any cable containment required and all ancillary components as well and supports shall be deemed as included.

5 **Cable support**

- 5.1 The methods of cable support shall be non-combustible and so circuit integrity will not be reduced below that afforded by the cable used. The cable support should withstand a similar temperature and duration to that of the cable, while maintaining adequate support. The cable support shall be as per manufacturer cable installation specifications

6 **Cable Basket**

- 6.1 Cable Basket shall be installed in the upright position throughout. Cable basket shall not be installed in the inverted position. Cable Basket shall incorporate fire barriers or seals to preserve the integrity of the slabs between floor levels on vertical runs and at fire walls for horizontal runs. The Cable Basket manufacturer's set pieces shall complete the installation. All sharp edges and burrs on internal surfaces shall be removed or bushed as necessary to provide a smooth passage for the pulling in of the cables. All Cable Basket and fittings shall be manufactured to standards as described in BS EN 50085-1:2005 and manufactured throughout in best quality hot dipped galvanised sheet steel to BS EN 10346:2015. Fire Alarm cables installed in cable basket shall be secured to the cable basket using non-combustible fixings.

7 **Conduit**

- 7.1 Conduit and fittings shall be under IEC 61038. Conduit shall be Heavy gauge, welded, Class 4, hot-dipped galvanised steel, zinc-coated screw threads and zinc bichromate outer coating to comply with BS31. Rigid steel conduit and fittings shall conform to BS4568.

8 **Cable**

- 8.1 All cabling is to be as per I.S.3218:2024 and all conductors shall have a cross-sectional area of at least 1 mm², except for data communication cables.
- 8.2 Loops shall be wired using 1.5 mm² / 2 core zero halogen, low smoke, flame retarding cable and meeting the standard laid down in I.S.3218:2024, BS 5839 part 1 2017 and BS 6387 categories C, W and Z LL2E1.5R and BS8434: 2003.

- 8.3 Loops shall not be teed under any circumstances and loop installation shall be planned to accomplish this. 4-core cables and junction boxes shall not be utilised as defined per the requirements of I.S.3218:2024.
- 8.4 Cables used for control panel networking shall be 2.5mm² 2 core zero halogen, low smoke, flame retarding cable and meeting the standard laid down in I.S.3218:2024. Cabling installed in underground ducting between buildings shall be afforded mechanical protection as per I.S.3218:2024 clause 6.14.

9 Segregation of Services

- 9.1 Cables of various voltages, functions, and separate supply sources shall be segregated from each other and spaced sufficiently far apart to eliminate interference between services.
- 9.2 The cabling of extra low voltage (below 50v) emergency lighting systems may use the same main containment as that of Fire Alarm loop wiring subject to prior approval and risk assessment.

10 Mains Connections

- 10.1 The dedicated 230vac supply, from local distribution boards for all fire alarm panels and fire alarm repeater panels, shall be completed in closed steel conduit containment system and terminated on a surface mounted brushed stainless metal clad un-switched fused outlet c/w neon.
- 10.2 A warning notice shall be fixed to the main disconnecting device of the general service installation giving warning that its operation will disconnect the supply to the fire alarm system. "WARNING: THIS SWITCH DISCONNECTS THE FIRE ALARM SYSTEM".

11 Software

- 11.1 As specified; only Fire alarm systems/panels which are Open Protocol shall be considered.
- 11.2 All control panels must have latest proprietary firmware versions and the latest proprietary software versions must be used when programming the configuration files.
- 11.3 All required software:
 - (a) security codes and devices (keys/dongles) shall be supplied at hand over and shall be supported for the life of the system.

- (b) No additional fees shall be incurred by Monaghan General Hospital for the life of the system in relation to same (Software, License / dongle fees etc.).
- (c) For the life cycle of the system, all costs associated with proprietary software/firmware updates or fixes due to bugs shall be the full responsibility of the system supplier. A copy of the configuration is to be supplied with the software in electronic format as part of the handover.

12 Fire Alarm Panels

- 12.1 The proposed Addressable Open Protocol fire alarm control panels shall comply with the requirements of BS EN 54-Part 2:1997 & amendment 1:2006 Control and Indicating Equipment.
- 12.2 All fire alarm and active fire alarm repeater panels must can have different levels of password-controlled user functions programmed, i.e. basic user enable control level and maintenance disablement function level.
- 12.3 All panels must be capable of automatically reverting to standby mode after a pre-determined and adjustable time lapse and require a password to be entered before controls can be made active.
- 12.4 Surface mounted services enclosure to house fire alarm control panel.
- 12.5 The surface mounted services enclosure shall be a 3mm moulded plastic case with a high gloss easily cleaned external surface.
- 12.6 The enclosure shall be screw fixed to wooden battens located inside the enclosure. The wooden battens shall run the full length of the enclosure on each side within the enclosure.
- 12.7 The fire alarm control panel shall be recessed into the enclosure and fixed directly to the back wall. The fire alarm panel aperture shall be reinforced with 16mm thickness moulded plastic around the inner perimeter of the aperture to facilitate the flush mounted fixings of the control panel bezel.
- 12.8 The mains power spur outlet for the fire alarm control panel shall be flush mounted into the enclosure above and within close proximity to the fire alarm control panel.



12.9 The spur outlet aperture shall be reinforced with 16mm thickness moulded plastic around the inner perimeter of the aperture to facilitate a flush mounting of the flush mounted 1 gang metal back box for the spur outlet.

12.10 A 100mm x 50mm steel trunking shall be installed within the surface mounted services enclosure void.

12.11 The 100mm x 50mm trunking shall be securely fixed to the wall and flanged up to the top of the fire alarm control panel.

12.12 The trunking shall be electrically connected to the fire alarm control panel.

12.13 The trunking shall not be mechanically connected to the control panel.

12.14 The control panel trunking aperture sharp edges shall be protected with a pvc profile material such that no damage is incurred by the fire alarm cables when passed through the aperture from the trunking. The trunking shall extend a minimum 500mm beyond the top of the surface mounted enclosure into the ceiling void and fitted with a trunking end cap.

12.15 All fire alarm firetuff cables shall be glanded into the galvanised steel trunking in the ceiling void and carried down to the fire alarm panel inside the steel trunking.



13 **Pager Interface**

13.1 The fire alarm pager interface shall be a Compatible Pager interface unit utilising industry standard protocol ESPA 4.4.4 and connect to the equipment via a serial data connection.

13.2 The pager interface unit shall be monitored for pager faults.

13.3 The pager interface shall be provided complete with a dedicated stand-alone pager interface unit enclosure.

13.4 A second pager interface unit shall be required on the existing Monaghan General hospital pager system to interface the fire alarm pager interface the hospital paging system.

14 **Devices**

14.1 Details and specifications of all equipment, main panels, detectors, interfaces, audio/visual devices shall be submitted as part of the proposal within the tender submission.

15 **Manual Call Points**

- 15.1 Manual Call Points shall be suitable for flush or surface mounting and be supplied complete with plastic box, test probe and fitted with a non-frangible element. A special key to test shall be supplied with each unit.
 - 15.2 All call points shall contain an integral LED to denote operational mode and to enable that device to be identified 'in the field' from the main panel controls.
 - 15.3 All call points are to be complete with integral short-circuit isolator. All call points shall be at 1000mm above finished floor level.
 - 15.4 Manual call points shall comply with IS3218: 2024 & EN54: part 11.
 - 15.5 Hinged anti-vandal plastic covers are to be provided to all Manual Call Points.
- 16 **Smoke and Heat sensors**
 - 16.1 Smoke and heat sensors shall be complete with a common base suitable for surface mounting to a standard BESA box.
 - 16.2 All cable entries into BESA Boxes must be made through fireproof glands. All BESA boxes must be supported by suitable grounds that transverse across the tile main support grid.
- 17 **Smoke Detectors**
 - 17.1 Smoke Detectors shall be loop powered. They shall be of the analogue addressable type and shall be of the optical type unless otherwise specified.
 - 17.2 A common base shall allow interchange with ionisation, heat or multi detectors. This detector shall be suitable for conjunction with the control panel specified.
 - 17.3 These detectors shall be installed under IS3218: 2024 and detectors shall comply with EN 54: part 7.
- 18 **Heat Detectors**
 - 18.1 Heat Detectors shall be loop powered. The Heat sensors shall be configured at the main panels to operate simultaneously in both fixed and Rate of Rise modes.
 - 18.2 A common base shall allow interchange with ionisation, optical or multi detectors.
 - 18.3 The maximum temperature for all heat sensors is to be advised prior to commissioning. These detectors shall be installed under IS3218: 2024 and shall comply with EN 54: part 5.
- 19 **Sounders & Beacons**
 - 19.1 All Wall Sounder and Sounder Bases shall be loop powered. The sounders shall have adjustable volume control with a maximum sound level of least 98dB(A) at 1m and comply with the frequency requirements of IS3218:2024.

- 19.2 Each sounder shall be suitable for connecting directly to the detector loop. All rooms and areas to achieve at least 45dB (65db) or 5dB above ambient noise level, whichever is greater.
- 19.3 Ambient noise is defined as any noise sustained for a period of 30s or more. Sound levels shall be designed so they do not exceed 110dB at any point within the building as this can cause disorientation and delay occupant from evacuating the building. Sounders should comply with EN 54: part 3 and visual alarms shall comply with EN 54: part 23.
- 19.4 Beacons/Strobe Units shall be addressable looped powered units with high intensity LED's.
- 19.5 Fire alarm strobes shall be provided with red lens covers and shall be synchronised.

20 **Fire Alarm Interface Units**

- 20.1 The tenderer shall allow for an interface to the items of equipment or plant controlled by the existing fire alarm system.
- 20.2 These shall include (if any) roller shutter doors, boiler control panels, door-hold-open devices, access-controlled doors, gas proven panels, personnel attack systems, paging systems, lift control, smoke dampers / AOV's and other devices as required.
- 20.3 The tender shall also include for all final connections to the devices/panels and for the attendance of the relevant specialist providers to connect and commission these links.
- 20.4 All I/O's must have volt free switching contacts options of switching N/O and N/C and must have integrated switchable contacts capable of switching 220/240 vac.
- 20.5 All interface units are to be complete with integral short-circuit isolator. Interface units shall be installed under IS3218: 2024 and shall comply with EN 54: part 18

21 **Air Sampling Units**

- 21.1 The tenderer shall supply, install and commission a very high sensitivity Aspirating Smoke Detector (ASD) system in each lift shaft (see tender drawings for lift shaft locations). Each ASD will provide detector sensitivity class selection of A, B, or C as set out in EN54-20 and the FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.
- 21.2 The scope of work shall allow for a single air sampling pipe including modifications to orifice sizes, air intake imbalances required to operate the

sampling process in order to verify that the proposed units will function correctly in the ambient environment.

- 21.3 Aspiration pipe transport times must be achieved and proven through reliable calculations in accordance with requirements set out in EN 54-20 and submitted as part of this proposal.
- 21.4 The Air Sampling proposal is to include all design calculations with any proposed system being in full compliance with EN54 part 20.
- 21.5 The objective of which is to provide enhanced maintenance flexibility while improving accessibility during the statutory inspection and testing regime.
- 21.6 The air sampling pipe network is installed inside and at the top of each lift shaft while the air sampling detector is installed external to the lift shaft in rooftop plant rooms beside the lift overrun or where no rooftop plantroom exists on the top floor in close proximity to the lift shaft.
- 21.7 The ASD exhaust pipe shall be returned into the lift shaft within close proximity to the detection pipe to minimise the possibility of pressure imbalances.
- 21.8 This specification shall be used as the basis to provide a compressive cost for an approved unit, including the power supply units, batteries and Fire Alarm interfaces.
- 21.9 The bidder must review each of the applications independently and verify the engineering requirements of each air sampling application on a per application basis.
- 21.10 The installation work followed by the inspection & testing is to be carried out, where practical during normal working hours (8:00 am to 18:00pm Monday to Friday) however the successful bidder must submit a programme of work showing the most efficient installation program taking cognisance of achieving a safe, compliant and effective method of installation in a live building.
- 21.11 A delivery programme is required and shall include equipment approval submittal and details of design where necessary, equipment lead in times and delivery dates, installation work schedule, test and commissioning, certification and operation and maintenance documentation submittal must be submitted as part of the tender.
- 21.12 Aspirating systems should be set up and commissioned to suit the environment they are installed in and programmed to provide an early warning on the fire system network.
- 21.13 Unless otherwise specified and approved, all sampling pipework shall be industry standard RED ABS pipe classified in accordance with BSEN 61386 to at least class 1131. Suitable and appropriate fixing supports must be used and approved.

- 21.14 The ASD shall have the capacity to cover an area in class C application.
- 21.15 Each pipe run from the ASD shall be fitted with an inline air filter which will be external the ASD unit. The ASD shall be a single channel unit.
- 21.16 The ASD shall have sealing ingress rating of IP65, in addition to the IP65 sealing, to provide further ingress protection the ASD electronics will be mounted in a separate internal chamber that does not require access during installation and commissioning or routine maintenance of the ASD system.
- 21.17 The sampling pipe network design shall be by the manufacturer or the manufacturer's approved and trained ESD and shall be produced via the ASD manufactures EN54-20 single software design, configure, monitoring tool.
- 21.18 The EN54-20 single software design, configure, monitoring tool shall produce 3D sampling pipe network designs.
- 21.19 The EN54-20 single software design, configure, monitoring tool shall allow for ASD configuration, sampling pipe network design and ASD monitoring.
- 21.20 The EN54-20 single software design, configure, monitoring tool shall generate the 7 required design documents that verify the design compliancy with EN54-20 and the local Code of Practice for ASD system application inclusive of : System design Class, Transport time, Hole sensitivity, Sample air flow rate, Sample point location, Sample air pressure and sample pipe network configuration.
- 21.21 A single ASD shall not cover more than 1000m² or more than 1 fire zone. The ASD shall be secured via the manufactures mounting bracket.
- 21.22 The installation of the ASD system shall comply with EN54-20 approved equipment inclusive of pipe and pipe fittings and accessories along with the FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.
- 21.23 The following parts of the ASD system shall be clearly labelled;
- (a) • Sample pipe
 - (b) • Sample points
 - (c) • ASD Unit
 - (d) • Power Supplies and Battery enclosures.
 - (e) In Line Air Filter
- 21.24 The labelling shall clearly identify the purpose and where appropriate the zone location of the equipment.
- 21.25 Aspirating systems should incorporate a sampling 'TEST-POINT' located in an appropriate and easily accessible position outside the lift shaft to allow system to be tested and maintained.
- 21.26 The commissioning of the installed ASD system must comply with and include performance testing as defined in the FIA Design, Commissioning & Maintenance

of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.

22 Smoke Beams

22.1 Smoke beams shall be the motorised reflective smoke beam type complying with EN 54-12:2015. The beams shall offer a detection range of up to 100m. Three hand held remote control units for commissioning and monitoring from ground level.

23 Third Party Connections

23.1 The tenderer shall allow for all connections to all third-party equipment which is controlled, and interface linked to the FDAS at each FDAS interface location.

23.2 The tenderer should also allow for the attendance by all third-party equipment suppliers/maintenance companies to connect, test and commission all third-party equipment control links from the FDAS.

24 Certification

24.1 Certification in relation to fire alarms to be provided as per I.S.3218:2024 Annex C: Fire detection and alarm system.

B.2 EMERGENCY LIGHTING SYSTEM (“ELS”)

1.1 The new addressable ELS must be designed in accordance with:

- (a) I.S.3217:2023;
- (b) National Guidelines for the Prevention of Nosocomial Invasive Aspergillosis During Construction/Renovation Activities;
- (c) HSA Guidelines Leaflet - Summary of Key Duties under the Procurement, Design and Site Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations, 2013;

1.2 The provision of a ELS shall be installed to all areas of the Hospital as indicated on the Tender Drawings Schedule.

1.3 Statutory Compliance for Emergency Lighting in Hospitals.

	Document Name	Document description
Base Guidance Document	I.S 3217: 2023 <i>Code of practice for Emergency Lighting</i>	Give general recommendations and guidance on the provision and operation of emergency lighting in most premises other than dwellings
	Health Technical Memorandum HTM 05-02 <i>Guidance to support functional provisions for healthcare premises</i>	Sets out healthcare specific measures to meet functional requirements of Part B (Fire Safety) to the Building Regulations 2000 for all healthcare buildings
System Standards	EN 1838:2013 (BS 5266-7:2013), <i>Lighting applications – Emergency lighting</i>	Specifies the illumination to be provided by emergency lighting (including illuminance, duration and colour)
	EN 50172:2004, <i>Emergency escape lighting systems</i>	Specifies the minimum provision and testing of emergency lighting for different premises
	Health Technical Memorandum HTM 06-01 Part A - <i>Electrical services supply and distribution</i> I.S. 10101:2020 <i>National Rules for Electrical Installations (ETCI)</i>	Provides guidance on the design, installation and testing of all fixed wiring and integral electrical equipment used for electrical services within healthcare premises.
	CIBSE Lighting Guide LG 02 2019 <i>Hospitals and health care buildings</i>	Basic requirements for the provision of lighting for hospitals
	CIBSE LG12:2015 <i>Emergency Lighting Design Guide</i>	Advice on the design of emergency escape lighting schemes and installations

Product Standards	EN 60598-2-22:2014+A1:2020, <i>Luminaires for emergency lighting</i>	Specifies self-contained and centrally powered luminaires for emergency lighting systems
	EN 50171:2001, <i>Central power supply systems</i>	Specifies central power supply systems for luminaires for emergency lighting
	EN 62034:2012, <i>Automatic test systems for battery powered escape lighting</i>	Specifies a test system for battery powered emergency lighting
	EN 13032, Parts 1, 2 & 3 <i>Light and lighting.</i>	Specifies methods for measurement and presentation of photometric data of lamps and luminaires.
	ISO 3864-1 2011 <i>Graphical symbols — safety colours and safety signs</i>	Design principles for safety signs and safety markings

**All emergency lighting systems shall be addressable LED (PERC) intelligent systems.
Containment shall be a closed steel system.**

2 Emergency lighting

- 2.1 The emergency lighting system shall be a complete, but separate, lighting installation supplied from a standby power source. The installation shall use dedicated emergency luminaires to operate from the standby power supply. The standby power supply may consist of either locally mounted rechargeable batteries or central battery systems.
- 2.2 Escape route lighting should be provided for the safe movement of occupants from the areas of risk to safe areas, whereas standby lighting is provided for the continuation of essential activity. Escape route lighting should be provided within five seconds of a power failure. Therefore, it should be powered from self-contained or remote batteries.
- 2.3 Escape route lighting circuits supplied from central batteries should be separated from all other wiring and where possible routed to avoid passing through areas of high fire risk, besides being wired using fire rated cable. The design should be in line with the requirements of I.S. 3217: 2023. Design guidance is also provided in SLL Lighting Guide LG12: Emergency lighting design guide.

3 Escape route lighting

- 3.1 Safety and escape route lighting is required for the movement of staff and visitors to a safe location in an emergency and the full evacuation of the building. Any

recessed emergency luminaires used on an escape route must retain the fire integrity and the rate of fire spread of the surrounding ceiling system. In practice this means that any attachment used must withstand the 850 °C glow wire test and be manufactured from a self-extinguishing material such as polycarbonate or a tPA-based polymer. Some people using these premises maybe physically incapacitated. When dealing with such premises, it is essential to give due regard to these factors and look carefully at problems that may arise because of the physical requirements of some staff/visitors.

- 3.2 These circumstances must be catered for: staff/visitors such as blind or deaf staff/visitors and wheelchair users, who may need assistance.
- 3.3 In case of emergencies, Monaghan General Hospital staff/visitor shall adopt “Simultaneous Evacuation” protocol. The levels of illumination therefore should allow the process of “Simultaneous Evacuation” to be made easy, particularly in those areas where physically incapacitated staff members/ visitors may be present.
- 3.4 Escape route lighting is required at these locations:
 - (a) corridor intersections
 - (b) changes of direction and level
 - (c) stairways and lift halls
 - (d) exit doors
 - (e) fire alarm call points
 - (f) firefighting equipment
 - (g) outside final exits.
- 3.5 Besides the above, emergency lighting provision must be made for areas over 30 m², all toilet areas, plant rooms, wards, treatment rooms, bedrooms & communal rooms, kitchens and nurses’ stations. Having determined the essential locations for luminaires along the routes for movement and escape to the exterior at ground level, intermediate lighting points will have to provide adequate illuminance along the selected routes.
- 3.6 This should be in line with the requirements of I.S. 3217:2023, which calls for at least 1 lux on the centre line of a 2 m wide escape route.

- 3.7 Elsewhere at least 0.5 lux should be provided to all non-designated escape route areas requiring emergency lighting. The lighting designer should know that the majority of users within these premises will likely suffer from some physical defect and that in addition some users may be elderly and suffering from defective vision. The emergency lighting may to be at a higher level than would be necessary in other types of premises.
- 3.8 Lift cars and lift shaft emergency lighting shall be excluded from the coverage.
- 3.9 Fire muster points, dedicated refuge areas and nurse stations must be given special consideration to ensure they are illuminated to at least 5 lux and are visible or stand-out from the surrounding area.
- 3.10 Illuminated signs on the movement and escape routes should comply fully with ISO 3864-1:2011
- 3.11 The electrical supply for escape route lighting shall be maintained by one of these methods.
 - (a) A central battery system which provides immediate electrical supply to the emergency lighting luminaries for at least three hours.
 - (b) Self-contained emergency luminaires that provide at least three hours capacity to power the lamp(s).

4 Emergency Lighting Installation

4.1 General

The electrically powered emergency lighting system shall be of these types:

- (a) self-contained systems,
- (b) central powered systems using centrally supplied luminaires.

To ensure that emergency escape lighting operates when required, it should be installed, tested and maintained under EN 60598-2-22, EN 50172 and EN 62034.

For each type of system there are three principal modes of operation; maintained, non-maintained or combined.

4.2 Self-contained luminaire systems

In a self-contained system the luminaire contains all the elements such as the battery, the lamp, the control unit and the monitoring facilities, or else these elements may be located outside the luminaire, within a distance of 1 m.

Upon failure of the supply to the normal lighting, the luminaire shall operate automatically from the battery.

Following partial or full discharge, the internal circuitry shall accept the restored mains supply to recharge the battery ready for further operation.

4.3.1a Central power systems (CPS)

4.3.2b Central Battery System (CBS)

An emergency lighting system, compliant to EN 50171, which distributes an emergency electrical supply from a central battery unit (CBU), via a fire, water resistant and mechanically protected distribution system, to several centrally supplied luminaires. This system provides an emergency lighting supply source upon failure of the normal supply (Non-Maintained System) or an emergency lighting supply source at all material times (Maintained or Combined System).

The emergency supply from a Central Battery System may be a.c. or d.c. at a range of potentials from 12 V to 230 V a.c. or d.c.

All isolators and/or protective devices, within the central battery distribution system shall be of multi-pole ganged type.

4.3 Static inverter system (SIS)

An emergency lighting system, compliant to EN 50171, which distributes an emergency electrical supply from a Static Inverter Unit (SIU), via a fire, water resistant and mechanically protected distribution system, to several centrally supplied slave luminaires. This system provides an emergency lighting supply source upon normal supply failure (Non-Maintained) or an emergency lighting supply source at all material times (Maintained or Combined).

The emergency supply from a Static Inverter System is normally a.c. at mains voltage potential.

All isolators and/or protective devices within a static inverter distribution system shall be of four pole types with three phase supplies and of double pole for single phase supplies.

4.4 Automatic test Systems ATS – PERC minimum requirement

There are different formats of automatic testing systems (ATS). To increase the speed and efficacy of the selection process, this ATS classifications have been developed. Please note the tender calls for a PERC type system.

Type S This is a stand-alone ATS consisting of a self-contained luminaire with a built-in testing facility that provides a local indication of the condition of the luminaire, but still requires all luminaires to be manually inspected, with a manual record made of the information indicated by luminaires.

Type P The emergency luminaires are monitored, and their condition is indicated by a test facility that collects and displays the results of the tests, but requires manual recording of information on the tests.

Type ER As type P, but the test facility collects results, and data is recorded and logged by the ATS.

Type PER As types P or ER, but with a collated fault indicator that automatically indicates failure of the luminaires that have been tested.

Type PERC As type PER, but with the additional features of a central controller, for setting parameters, configuration of the system and the central controlled initialization of the test and where the date, time and duration of the test is defined by the central controller.

The PERC systems to comply fully with EN 62034:2012 and comply with the figures and tables for self-contained systems and central battery systems.

Table A.1 – Standards conformity guide

Part/Component	Relevant IEC standards
Luminaire	IEC 60598-2-22 and IEC 62034
Ballast	IEC 61347-2-7
Test circuit	IEC 61347-2-11 and IEC 62034

A.3 Multi-luminaire system with central monitoring for self-contained emergency luminaires

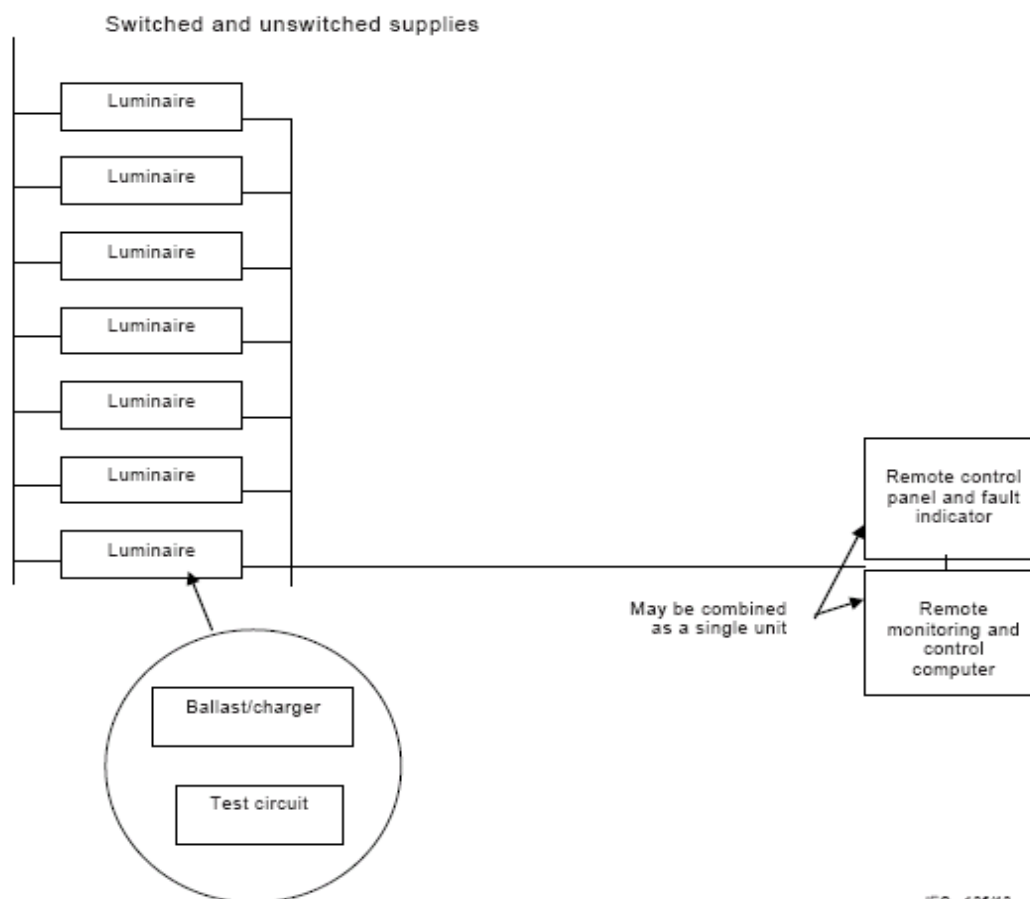
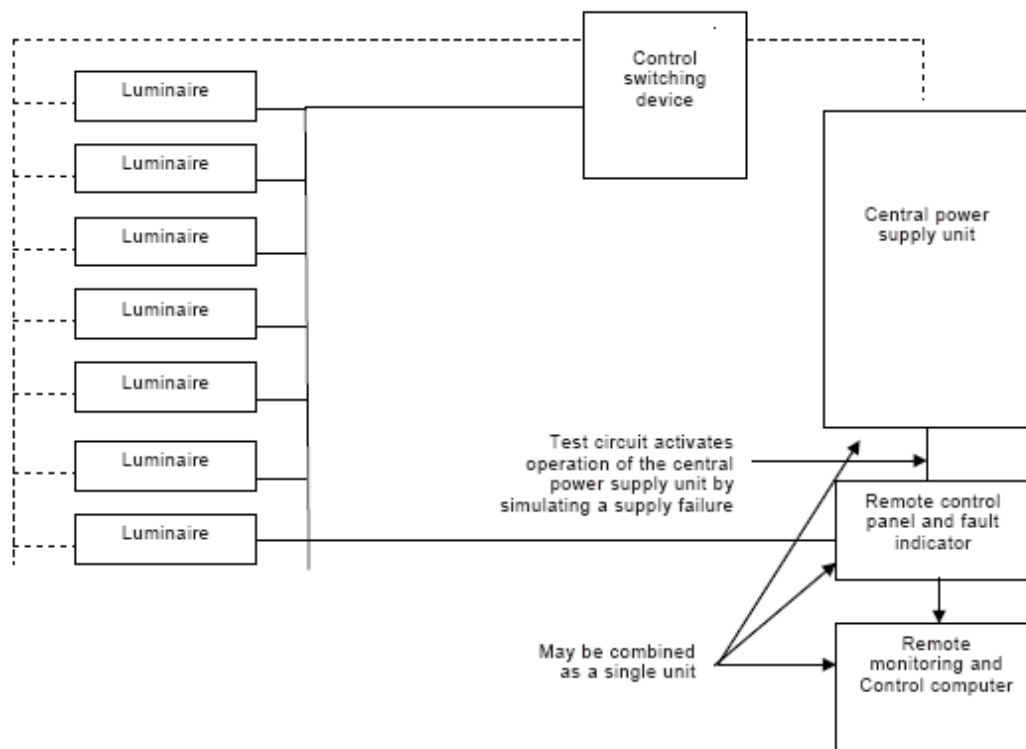


Figure 7 – Direct connection between luminaires and remote panel

A.4 Central battery multi luminaire systems



IEC 125/12

4.5 Figure 8 – Direct connection between luminaires and remote panel

Table A.3 – Standards conformity guide

Part/component	Standards
Luminaire	IEC 60598-2-22 and IEC 62034
Ballast	IEC 61347-2-7
Test circuit	IEC 61347-2-11 and IEC 62034
Central power supply unit	Relevant national standard
Control switching device	Relevant national standard
Control panel	IEC 61347-2-11 and IEC 62034
Computer	IEC 62034 (software only)
System (see Note1)	IEC 62034
Communications wiring	IEC 62034
Connectors	Relevant IEC standard
NOTE 1 The system must be fully assembled with sufficient luminaires and other components to allow the assessment of discrete component failures on the overall operation of the system to be checked.	
NOTE 2 Conformity to IEC 62034 can only be declared for a complete system and not for component parts that has been inspected in isolation.	

5 Need for emergency lighting.

5.1 General

When the supply to the normal lighting of a premises fails, emergency lighting shall be provided. Throughout the tender reference to 'emergency lighting' covers 'emergency escape lighting' but also includes any element of standby lighting which may be used for emergency escape lighting.

5.2 Emergency escape lighting

When the supply to the normal lighting or parts of the normal lighting to occupied premises fails, emergency escape lighting shall be provided:

- (a) to indicate clearly and unambiguously the escape routes;
- (b) to provide illumination along such routes to allow safe movement towards and through the emergency exits provided;
- (c) to ensure that fire alarm call points and firefighting equipment provided along escape routes can be readily located.

Emergency escape lighting shall operate, if failure of any part of the normal lighting supply occurs. Arrangements shall be made to ensure that local emergency escape lighting will operate in the event of failure of normal supply to the corresponding local circuit.

Emergency escape lighting is not designed to allow normal operations to be continued in the building in the event of failure of the normal lighting.

6 Illumination for safe movement

6.1 General

The safe movement of persons along escape routes towards and through the emergency exits provided to a place of safety depends upon the illumination and the ability to see hazards, changes of level and direction.

NOTE:- In building design any potentially serious obstructions or hazards on an escape route should be light in colour with contrasting surround. Where the design departs from the above, the designer may have to compensate with additional and appropriately positioned luminaires..

Escape routes shall be kept clear of unnecessary obstructions and shall not be storage areas.

Minimum illuminance

6.2 Defined escape routes

For escape routes up to 2 m in width, the horizontal illuminance on the floor along the centre line of an escape route shall be not less than 1 lux and the central band consisting of not less than half of the width of the route shall be illuminated to at least 50 % of that value.

Wider escape routes can be treated as several 2 m wide strips or be provided with open area (anti-panic) lighting (see 4.2.1 of EN 1838:2013).

These areas along defined escape routes shall achieve at least 5 lux: - disabled refuges, fire alarm control and indicating equipment, fire points, reception areas, nurses' stations (working plane), panic bars and pads or security on escape doors and areas immediately outside final exit doors

6.3 Undefined escape routes (open areas)

The horizontal illuminance shall be not less than 0.5 lux at the floor level of the empty core area which excludes a border of 0.5 m of the perimeter of the area (see 4.3.1 EN 1838:2013 and, 4.4 EN 50172:2004).

Plant rooms, switch rooms and laboratory areas should achieve a minimum illuminance of 5 lux in plane of visual task.

High risk task lighting has been risk assessed and it has been determined that until the said areas undergo future renovation or electrical upgrade works, these areas shall be provided with standalone emergency lighting of 15 Lux with a design response time of 5 seconds.

6.4 Response time

The emergency lighting to defined and undefined escape routes (open areas) shall reach 50 % of the required illuminance level within 5s and full required illuminance within 60s

6.5 Design conditions

The recommended minimum illuminances, i.e. 0.5 lux, 1 lux, 5 lux, and 15 lux shall be the lowest value acceptable during the rated discharge period and due to the effects of the system ageing (see EN 1838:2013).

In designing a system allowance shall be made for the relevant factors including reduction in voltage, voltage drop in the system wiring, lamp ageing and the accumulation of dirt and dust on the luminaire.

Requirements for the measuring of illuminance of emergency lighting are given in Annex of I.S. 3217:2023.

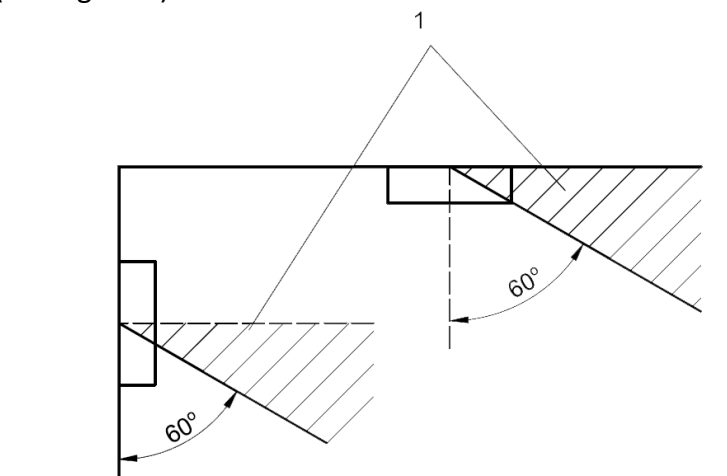
Uniformity of illuminance

The extreme ratio U_d of the minimum to the maximum illuminance (according to EN 12665) shall not be less than 1:40 along the centre line of the escape route [EN 1838:2013].

6.6 Glare

Disability glare shall be contained to an acceptable level by limiting the luminous intensity of the luminaires within the field of view.

For level horizontal escape routes, the luminous intensity of the luminaires shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth (see Figure 9).

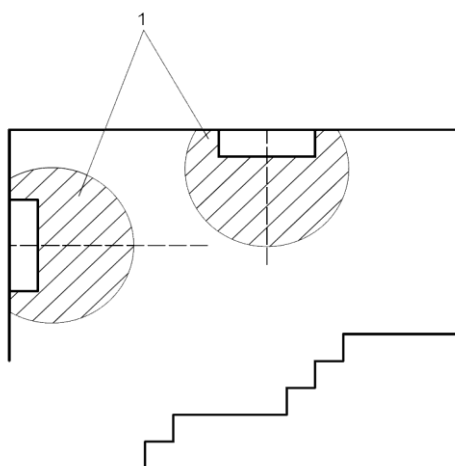


Key

- 1 Area where the maximum luminous intensity shall not exceed the values of table 1

Figure 9 – Glare zone for horizontal escape routes

For all other escape routes and areas, the limiting values shall not be exceeded at all angles (See Figure 10)



Key

1 Glare zone

Note: High contrast between a luminaire and its background can produce glare. In escape routes the main problem will be disability glare, in which the brightness of the luminaires can dazzle and prevent obstructions or signs being seen.

Figure 10 – Glare Zones for all other escape routes

Table 1 — Disability glare limits

Mounting height above floor level, h m	Escape route and open area (anti-panic) lighting maximum luminous intensity, $I_{\max}$ cd	High risk task area lighting maximum luminous intensity, $I_{\max}$ cd
$h < 2,5$	500	1 000
$2,5 \leq h < 3,0$	900	1 800
$3,0 \leq h < 3,5$	1 600	3 200
$3,5 \leq h < 4,0$	2 500	5 000
$4,0 \leq h < 4,5$	3 500	7 000
$h \geq 4,5$	5 000	10 000

Colour Rendering Index

To identify safety colours the minimum value for the colour rendering index Ra from a light source shall be 40. The luminaire shall not substantially subtract from this.

Compliance with 6.4 can be checked by measurement or by comparison with authenticated data from a supplier (see 4.2.3 to 4.2.6 of EN 1838:2013).

7 Emergency lighting design requirements

7.1 General

Emergency lighting shall be provided for use when the supply to the normal lighting fails and shall therefore be powered from a source independent of that supplying the normal lighting.

The emergency lighting system shall be designed so that operational testing of the system can be carried out without interrupting the normal supply.

Emergency escape lighting shall operate, in the event of failure of any part of the normal lighting supply occurs.

Emergency escape lighting shall operate, in the event of failure of any part of the normal lighting supply. Arrangements shall be made to ensure that local emergency escape lighting will operate in the event of failure of the normal supply to the corresponding local circuit.

NOTE 1: Where local circuit monitoring devices are used, these should be compliant to the changeover requirements of I.S. EN 60598-2-22 and I.S. EN 50171.

NOTE 2: For self-contained and non-maintained central battery systems where the supply to the local emergency escape lighting is not derived from the corresponding 'normal' lighting circuit(s), the use of local circuit monitoring should be limited to the local area and the corresponding circuit(s). This is to avoid the monitoring of an excessive number of circuits across different areas which would compromise the integrity of the system. The risk of unintended discharge of the system can be mitigated through the use of remote alarm indication.

7.2 System integrity

The illumination by the emergency escape lighting system of a compartment of the escape route shall be from two or more luminaires so the failure of one luminaire does not plunge the route into total darkness or make the directional finding effect of the system ineffective. For the same reason, two or more luminaires shall be used in each open area (anti-panic).

NOTE 1: It is not normally possible to cater for an interruption of the normal lighting due solely to the failure of an individual lamp. Consideration should therefore be given to methods of eliminating any probable hazard which might arise due to the failure of this lamp.

NOTE 2: The term “compartment” is used to mean a part of the escape route reliant on illumination within it. This term is not used in the same context of compartmentation as required by the Building Regulations.

NOTE 3: The provision of an internally illuminated exit sign may contribute to meeting the requirements of this clause for compartments no greater than 6 m² floor area.

7.3 Failure of emergency lighting luminaire

The failure of any one luminaire connected to a circuit shall not affect other luminaires connected to the same circuit.

This requirement can be satisfied with a fuse, relay or other protective device incorporated in each luminaire, or by protection against excessive fault currents being inherent in the design of the luminaire circuitry/components.

It is recommended that luminaires re-energised for self-contained emergency operation have a fuse, relay or other protective device on both switched and un-switched mains supplies.

7.4 Mounting height of luminaires

The mounting height of the individual luminaires will usually be governed by the physical characteristics of the area under consideration and the best solution shall be chosen. The luminaires shall be mounted at least 2 m above the floor level.

NOTE Luminaires should be mounted below smoke reservoirs where they are provided.

7.5 Siting of emergency escape lighting luminaires

An emergency escape lighting luminaire shall be sited at points where it is necessary to emphasise the position of potential hazards:

- (a) near (see NOTE 1) each exit door intended to be used in an emergency,
- (b) near (see NOTE 1) stairs so each flight of stairs receives direct light,
- (c) near (see NOTE 1) any other change in level,
- (d) externally illuminated escape route safety signs, escape route direction signs and other safety signs to be illuminated under emergency lighting conditions,
- (e) at each change of direction; (see NOTE 2),
- (f) at each intersection of corridors; (see NOTE 2),
- (g) near to each final exit and outside the building to a place of safety. If the immediate area outside the final exit has hazards in darkness then a risk assessment should determine if further emergency luminaires are needed until a place of safety can be reached.
- (h) near (see NOTE 1) each first aid post,

- (i) near (see NOTE 1) each piece of firefighting equipment and call point,
- (j) near (see NOTE 1) escape equipment provided for the disabled,
- (k) near (see NOTE 1) disabled refuges and call point also to include disabled refuge two-way communication systems including disabled toilet alarm call position,

Luminaires at positions denoted as h) or i) shall provide illuminance of 5 lx minimum at each point.

NOTE 1 For this clause "near" is normally considered within 2 m measured horizontally.

NOTE 2 For points e) and f), "at" means that the emergency luminaire would illuminate in both directions at the change of direction or intersection.

7.6 External areas near exits

To assist dispersal and to enable final exits to be negotiated safely, the level of illuminance in the area immediately outside such exits shall be not lower than that immediately inside the exit (5 lux minimum). An emergency lighting luminaire shall be placed externally within 2 m of each final exit.

7.7 Lift cars and lift shafts

For any passenger or goods passenger lifts, emergency lighting shall be installed which is capable of providing at least 5 lux for the rated duration;

- (a) At each alarm initiation device in the car and on the car roof,
- (b) In the centre of the car 1 m above the floor,
- (c) In the centre of the car roof, 1m above the floor.

Emergency lighting shall also be provided in the lift pit. The horizontal illuminance shall not be less than 1 lux at floor level.

Any luminaire connected to the main emergency lighting supply that is necessary in a lift car shall be on a separate circuit and shall be connected to an appropriate test facility.

Lifts cannot be part of an escape route except in very special circumstances and then only when fitted with their own emergency operating power supply. In such circumstances the illumination of the lift car shall meet the system integrity requirements detailed above.

NOTE 1: Due to the location of the emergency lighting luminaries in the lift shaft and on top of the lift car, it is recommended that the emergency lighting installed in these locations is connected to an appropriate Automatic Test System (ATS).

Note 2: Emergency lighting should be maintained by competent persons with appropriate training or under the supervision of those with appropriate training in these locations.

Note 3: a Goods passenger lift is mainly intended for the transportation of goods, which are generally accompanied by persons (See I.S. EN 81-20:2014)

7.8 Toilet areas and toilet lobbies (vestibules)

All toilet areas shall be provided with emergency escape lighting however borrowed emergency escape lighting may be used. The horizontal illuminance shall be not less than 0.5 lux at floor level.

An emergency exit sign shall be provided where the emergency exit is not conspicuous or where confusion could occur.

Disabled toilets shall be provided with emergency escape lighting. The horizontal illuminance shall be not less than 1 lux at floor level. Disabled cubicle(s) within toilet facilities shall have a minimum horizontal illuminance of 1 lux.

Shower cubicle(s) within toilet facilities shall have a minimum horizontal illumination of 1 lux. The ratio of minimum to maximum illuminance shall not be less than 1:40.

Toilet lobbies shall be provided with emergency escape lighting to the levels required for escape routes.

Refer to I.S.3217:2023 Annex E1 for typical arrangements of emergency escape lighting for toilet areas.

NOTE 1: The gross area of a toilet is that area bounded by the inner surfaces of the enclosing walls including the space occupied by any toilet and/or shower cubicle(s) and wash hand basin(s) within the area being measured.

NOTE 2: This clause does not necessitate the provisions of emergency lighting in a single occupancy toilet for use by an able-bodied person. However, single occupancy toilets with baby changing facilities should be provided with emergency lighting with a minimum horizontal illuminance of 1 lux.

NOTE 3: For toilets less than 6 m² floor area, borrowed light and/or light from an internally illuminated emergency exit sign may contribute to meeting the system integrity requirement for system integrity. An emergency exit sign should be provided where the exit is not conspicuous or confusion could occur.

NOTE 4: For toilet lobbies less than 2 m² floor area, spill light from an adjacent compartment through an open door, available when transiting the lobby, may contribute to meeting system integrity requirements.

NOTE 5: Borrowed light is emergency light transmitted, from one compartment to an adjacent compartment, through a glazed section in an interior partition or door. In the case of toilets, borrowed light should come directly from an adjacent compartment i.e., not through a lobby. In the case of lobbies, borrowed light should come directly from the escape corridor and not solely from the toilet area due to the fact that lobby lighting is normally supplied from the same circuit as the toilet area.

In the case of local circuit failure in toilets/lobbies, the normal lighting in the escape corridor would contribute (if activated) to borrow or spill light. For this reason, the designer should take cognisance of any presence detection control of the normal lighting in the corridor.

NOTE 6: For the purposes of Toilets, a single occupancy toilet for the use by an able-bodied person is not considered an inner room.

7.9 Motor generator, control, switch and plant rooms

Emergency lighting shall be provided in all motor generator rooms, control rooms, switch rooms, plant rooms and adjacent to main control equipment associated with the provisions of normal and emergency lighting to the building. The horizontal illuminance shall be not less than 1 lux at floor level. The illuminance on the main control equipment and switchboards associated with the provision of normal and emergency lighting to the building shall be not less than 5 lux in the plane of the visual task. 5 lux in the plane of the visual task.

NOTE Emergency lighting serving areas where rotating parts of machinery or rotating tools are present shall be non-stroboscopic.

7.10 Covered Car Parks

The defined pedestrian escape routes within covered and/or multi-storey car park/car parking areas shall be easily identifiable and shall be provided with escape route lighting.

7.11 Open area (anti-panic) lighting

The objective of open area (anti-panic) lighting is to reduce panic and to enable safe movement of occupants towards escape routes by providing appropriate visual conditions and direction finding. It is used in areas of undefined escape routes in halls

or premises larger than 60 m² floor area or smaller areas if there is additional hazard such as use by many people.

The horizontal illuminance shall be not less than 0.5 lux at the floor level of the empty core area which excludes a border of 0.5 m of the perimeter of the area.

Laboratories shall be provided with at least 5 lux.

7.12 Refuge areas

At a refuge call point and in the area for transfer of people from wheelchairs to evacuation devices, a minimum illuminance of 5 lux is required.

7.13 High Risk Task Area Lighting

All areas of high risk shall be provided with a maintained illuminance of not less than 10% of the required maintained illuminance for the task, and shall be not less than 15 lux. Emergency lighting in these areas shall be non-stroboscopic.

The minimum duration shall be not less than three hours.

High risk task area lighting

For buildings that have external roof mounted plant or roof plant rooms that require regular access (e.g. for maintenance), then in such circumstances where the roof area is extensive and/or particular hazards exist in relation to escape, emergency escape lighting shall be provided to allow for the safe egress of persons from the roof.

Emergency exit signs

7.14 General

Emergency exit signs for emergency escape lighting systems are subject to statutory requirements of Annex B I.S.3217:2023.

A detailed design and specification for an emergency exit signage should consider the following;

- (a) Using the premises;
- (b) the legislation applicable to the building and the requirements (if any) of enforcing authorities;
- (c) operational needs of the building's managers for example regarding public access and security provisions;
- (d) the evacuation strategy for the premises;
- (e) the degree of familiarity of the occupants with the premise.

7.15 Location of emergency exit signs

Emergency exit signs, either internally illuminated or externally illuminated, shall be positioned at all final exits and where necessary along all escape routes to indicate the direction to the next emergency exit, refuge area or assembly point. Where direct sight of a final exit is not possible, a series of emergency exit signs shall be placed along the escape route to assist progression towards the final exit.

When positioning emergency exit signs these principles shall be applied:

- (a) at least one escape route or doorway leading to an escape route should be visible from any point within every room or enclosure. Where this route is not conspicuous, or confusion could occur, the route shall be indicated by an emergency exit sign;
- (b) where direct sight of the escape route or of the emergency exit sign indicating the escape route is obstructed, one or more intermediate emergency exit signs shall be provided;
- (c) NOTE 1: For buildings that have external roof mounted plant or plant rooms that require regular access (e.g. for maintenance), then in such circumstances it is recommended that where confusion could occur as to the direction of the escape from the roof, emergency exit sign(s) should be installed.
- (d) emergency exit signs shall take precedence over all other signs;
- (e) all changes of direction in corridors, stairways and open spaces forming part of an escape route should be marked with intermediate emergency exit signs. Each intermediate door or junction should be similarly signed. Persons escaping along any designated escape route will always have an emergency exit sign in sight whenever a choice of direction or door must be made.
- (f) NOTE 2: Persons escaping along any designated escape route should have an emergency exit in sight whenever a choice of direction or door has to be made.
- (g) NOTE 3: In buildings that contain open areas where high shelving is required e.g. supermarkets, warehouses, storage units etc. emergency exit signs are not required to be visible by a person in an aisle formed by the shelving unless it is deemed necessary by the emergency lighting designer or is a requirement elsewhere in the I.S.3217:2023. Emergency exit signs should be visible from the end of each aisle when a choice of direction is available. Where the room containing the shelving (aisles) is an access room, then an emergency exit sign(s) should be visible to a person on exiting the inner room.

- (h) NOTE: The provision of an emergency exit sign at each half landing is not a requirement of this standard unless due to the layout of the building confusion could otherwise occur as to the direction of the escape.
- (i) additional emergency exit signs shall be provided where the line of sight to the next sign would otherwise exceed the recommended maximum viewing distance for the chosen size of sign;
- (j) an emergency exit sign shall be provided wherever confusion may otherwise occur;
- (k) An emergency exit sign shall be provided near to each final exit. If the immediate area outside the final exit has hazards in darkness then a risk assessment should determine if further emergency exit signs are needed until a place of safety can be reached.
- (l) every designated escape route should lead to a place of safety. A place of safety should not be provided with emergency exit signs but may be provided with a sign indicating “assembly point”;
- (m) emergency exit signs shall not be fixed to doors or sited where they may be obscured by opening doors;
- (n) where commercial or artistic considerations require signs or objects which, because of their size, brightness, design or proximity, might be confused with or prevent recognition of an emergency exit sign, the location of the emergency exit sign may be slightly displaced provided safety is not compromised. Otherwise the confusing signs or objects should be removed;
- (o) the effectiveness of an emergency exit sign shall not be adversely affected by the presence of other signs, conveying directional information in a similar format or by other internally illuminated signs or by competing or distracting light sources.

7.16 Illumination

Emergency exit signs shall be illuminated at all material times and if failure of the supply occurs to the normal lighting.

For maximum visual impact emergency exit signs shall be placed perpendicular to the line of sight of persons using the escape route.

NOTE: Photo-luminescent exit signs cannot be used in place of electrically powered signs but can be used as supplementary and/or externally illuminated signage.

7.17 Internally illuminated emergency exit sign

The luminance of any coloured area of the safety sign shall be at least 2 cd/m² for all viewing distance on emergency operation. (see 5.4 of EN 1838:2013 and Annex A of EN 1838:2013).

The ratio of the maximum to the minimum luminance within either white or the safety colour shall be not greater than 10:1.

NOTE: High variation of adjacent points should be avoided.

The ratio of the luminance/contrast colour to the luminance/safety colour shall be not less than 5:1 and not greater than 15:1.

The safety colour and contrast colour shall conform to the requirements of ISO 3864-1 and ISO 3864-4, and shall be measured in accordance with ISO 3864-4.

The minimum duration of illumination of the safety signs shall be 3 hours.

Safety signs shall be illuminated to at least 50 % of the required luminance within 5 s and full required luminance within 60s.

7.18 Externally illuminated emergency exit sign

Where a sign is illuminated by an external source the vertical illumination shall be a minimum of 50 lux under normal lighting conditions and at least 15 lux, at a uniformity of 0.7 in emergency operation.

The position of the luminaire(s) relative to the sign shall be such on cause no reduction in the contrast of the sign (due to reflection of the luminaire in the face of the sign) when viewed within the required range of directions.

A luminaire provided specifically to light the sign shall be mounted at a maximum distance of 2 m from the sign. To allow the sign to be seen more effectively the luminaire(s) shall employ optics with a cut off angle $\leq 60^\circ$ within the observers field of vision at an angle $\leq 20^\circ$ above the horizontal view.

7.19 Viewing distance

An internally illuminated sign is discernible at greater distance than an externally illuminated sign of the same size

The maximum viewing distance (see Figure 4) shall be determined by the following formula;

$$I = Z \times h$$

where:

I is the distance of observation

h is the height of the graphical symbol of the sign

Z is the factor of distance (Z is a constant: 200 for internally illuminated signs; 100 for externally illuminated signs) The dimensional units of h and I shall be the same.

NOTE: The minimum height of the graphical element for all illuminated exit signage shall be 100 mm.

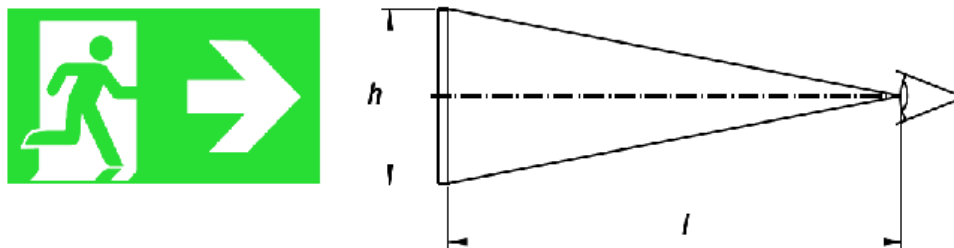


Figure 4 –Viewing Distance

7.20 Mounting height

Signs shall be positioned between 2 m and 3 m above floor level measured to the base of the sign. If this is not practical the fire authority shall be consulted

NOTE: To ensure that the emergency exit sign is within the observer's field of vision the sign should be mounted not higher than 20° above the horizontal view for all observer points within the viewing range of the sign.

These principles, which will assist the evacuee to predict the location of successive signs, should be applied:

- (a) signs above doors or in open spaces shall be mounted between 2 m and 3 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practical,
- (b) where smoke reservoirs are provided, the emergency exit signs shall be mounted below these,
- (c) mounting heights greater than 3m may be used, e.g. in large open spaces or for operational reasons, but care shall be taken to ensure that such signs are both conspicuous and legible,
- (d) signs shall be sited at the same height throughout the escape route, so far as is reasonably practicable.

8

Emergency lighting luminaires

8.1 Construction

8.2 Emergency lighting luminaires can be self-contained or slave luminaires. Both may be used for emergency exit signage or emergency escape route lighting. These luminaires shall be designed and constructed under the requirements of EN 60598-2-22. For fusing requirements, see 8.3.I.S.3217:2023. For certain applications the luminaire itself shall have satisfactory protection against the ingress of foreign bodies or moisture; such protections are indicated by the IP classification as defined in EN 60529. In respect of the selection and installation

of luminaires for the use in potentially explosive atmospheres, the provisions of the National Rules for Potentially Explosive Atmospheres (ET 105) shall apply.

8.3 Photometric data shall be provided by the manufacturer under I.S. EN 13032-3.

8.4 Flammability

8.5 Emergency lighting luminaires shall comply with the non-flammability (resistance to flame and ignition) provisions specified in EN 60598-2-22. External parts should also be subjected to the 850°C glow-wire test of EN 60598-2-22 and any burning parts shall self-extinguish within 30 s.

8.6 Central power supply systems

Central power supply systems shall comply with EN 50171.

8.7 Batteries for central power supply systems

Batteries for central power supply systems shall comply with 6.12 of EN 50171:2001.

Batteries for central power systems (CPS) shall be of a type having a declared life expectancy of at least 10 years at 20 °C ambient temperature.

Batteries for low power systems (LPS) shall be of a type having a declared life expectancy of at least 5 years at 20 °C ambient temperature.

NOTE: To achieve full performance at the end of life, the battery capacity should be sized under the battery manufacturer's data.

8.8 Luminaire identification (slave luminaire)

For an emergency escape lighting luminaire that is powered by a Central Battery Unit or Static Inverter Unit each luminaire that forms part of the emergency escape lighting system shall be identifiable from floor level. Luminaires may be identified with label, tag or indicator light. Where it is impossible to place a label, tag or indicator light on the luminaire it shall be placed close to the luminaire but no greater than 200 mm from it.

NOTE: It is recommended that the text on the label or tag contains the luminaire number preceded with the text “EL” to indicate it is an emergency escape lighting luminaire. e.g. EL12 indicates this is emergency escape luminaire 12 on the system.

8.9

8.10 Batteries for self-contained luminaires

Batteries should be rated for at least 4 years of normal operation, and should be replaced when the luminaire no longer meets the required duration.

The surface temperature of batteries shall always be maintained within the rated operating temperature of the battery as defined by the manufacturer.

9 Circuit requirements and test facilities for self-contained luminaire systems

9.1 General

The electrical installation of emergency lighting systems shall be carried out to comply with the edition of the National Rules for Electrical Installations (I.S. 10101), published by the National Standards Authority of Ireland.

Suitably qualified persons shall be a registered electrical contractor (REC) as recognised by the Commission for Energy Regulation (CER).

9.2 Control equipment

Control equipment and batteries located outside a self-contained luminaire shall be mechanically protected and mounted in a fire-resistant enclosure and marked 'EMERGENCY LIGHTING'.

Power cables from the luminaire to the enclosure greater than 1 m in length, shall if 20 mm diameter or greater, meet the required survival time of 120 minutes (Category 3) when tested to BS 8491. Power cables of overall diameter less than 20 mm may be used if they can be demonstrated to give the same level of resistance to fire, impact and water jet as detailed in BS 8491. The cable shall meet the required survival time 120 minutes (Category 3) as detailed in BS 8491.

NOTE Wiring within a luminaire is excluded from the requirements of this clause and is covered separately in EN 60598-2-22.

9.3 Test facility (PERC)

Each emergency lighting system shall have a suitable facility for simulating failure of the normal supply for test. The facility shall not interrupt the normal lighting supply to the area concerned. After the test period the emergency lighting system shall be automatically restored to its normal state. The facility for simulating failures shall can carry out these tests:

- (a) functional test of (typically 20s) but not exceeding 10% of the rated duration (ATS only),
- (b) functional test of 30 minutes and 10 minutes for 3 hour and 1 hour respectively (all test facilities except ATS),
- (c) functional test of 60 minutes (CGU only),
- (d) full duration test for 3 hours and 1 hour systems (all test facilities).

NOTE: In the case of non ATS systems, and depending on the size and layout of the building, consideration should be given to the number of emergency luminaires allocated to a manually operated test facility(s) to ensure adequate inspection time.

10 Wiring systems, circuit requirements, test facilities and location for central power supply systems

10.1 General

The electrical installation of an emergency lighting system shall conform with good electrical practice in design and construction. It shall be carried out to comply with the edition of the National Rules for Electrical Installations (I.S. 10101), published by The National Standards Association of Ireland.

A person deemed qualified for installing emergency lighting systems shall comply with the Commission Decision on Electrical Safety Supervisory Criteria Document, Appendix 1, Section C published by the Commissioner for Energy Regulation on 25th April 2008.

Suitably qualified persons shall also be members of one of these organisations;

Register of Electrical Contractors in Ireland (RECI),

or a registered electrical contractor (REC) as recognised by the CER.

10.2 Cables

Cables used in the connection of emergency lighting luminaries to their power supply shall, if 20 mm diameter or greater, meet the required survival time of 120 minutes (Category 3) when tested to BS 8491. Power cables of overall diameter less than 20 mm may be used if they can be demonstrated to give the same level of resistance to fire, impact and water jet as detailed in BS 8491. The cable shall meet the required survival time 120 minutes (Category 3) as detailed in BS 8491.

Normal internal wiring within a luminaire is excluded from the requirements of this clause and is covered separately in I.S. E.N. 60598-2-22. For jointing of fire resistant cables in emergency lighting luminaries please refer to 9.3.3.

Normal internal wiring within a panel is excluded from the requirements of this clause. The final 2 m (maximum) of cabling, and any associated male/female connector system, from the primary emergency lighting protected power supply circuit, to any emergency luminaire, i.e. the final connection to any emergency luminaire, is excluded from the requirements of this clause, only if all these conditions are satisfied:

- (a) the final 2 m of cabling from an emergency luminaire, and any associated male/female connector system, shall be heat resisting & LSZH in characteristic, be of a suitable electrical rating and specification for the required purpose and shall only connect/terminate at a suitable final electrical connection enclosure possessing a required survival time of 120 minutes,

- (b) all connectors internal to the final electrical connection fire resisting enclosure, protecting the primary emergency lighting power supply circuit's cables, shall be of ceramic/porcelain construction and be of a suitable electrical rating and specification for the required purpose,
- (c) internal to the final electrical connection fire resisting enclosure, protecting and discriminating with the primary emergency lighting power supply circuit's upstream protective devices, there shall be a ceramic fuse in a ceramic fuse carrier on both poles of the supply.

11 Wiring

11.1 General

In selecting cable sizes, due regard shall be paid to limitations imposed by voltage drop and physical strength.

Each conductor shall be of copper having a nominal cross-sectional area of not less than 1.5 mm².

The voltage drop in cables connecting a central battery to a slave luminaire shall not exceed 4 % of the system nominal voltage at maximum rated current and at the highest working temperature likely to be experienced.

Slave luminaires shall be compatible with the central power supply to which they are to be connected. The slave luminaires shall be compatible with an a.c. or a d.c. voltage and with the input voltage range, considering load voltage regulation, end of duration battery voltage and cable voltage drop.

11.2 Cable installation practice

Wiring of emergency lighting installations shall be exclusive to the installation and segregated from the wiring of other circuits, so the emergency lighting circuits are protected against damage that may be caused by faults on other circuits, so they are protected against interference that might occur during maintenance or alteration of other services.

Ducting, trunking containing emergency lighting cables shall be marked to indicate its use.

When installing cables required to maintain circuit integrity under fire conditions, the resistance to fire of the cable fixings, cable containment system and any joints should be at least equivalent to the survival time required for the cable. Cables shall be installed under these recommendations:

- (a) where fire-resistant cables have by their method adequate mechanical protection (e.g. cables conforming to BS 8491 or BS 8434), they shall either be fixed directly to the building structure, or be installed so they are enclosed in or carried upon cable management or containment

systems [see item b)]. If the cables are fixed directly to the building, the fixings shall provide adequate support in the presence of the potential hazards,

- (b) where fire-resistant cables require additional mechanical protection, they shall be enclosed in or carried upon cable management or containment systems. Such systems shall provide adequate support and maintain necessary mechanical protection in the presence of the potential hazards. The supports shall be oversized to cater for the reduction in the tensile strength of steel when exposed to the effects of fire,
- (c) cable management or containment systems not used as a primary means of support or to provide necessary mechanical protection shall not compromise the defined performance of the cables in the presence of the potential hazards,
- (d) any glands used in the termination of fire-resistant cables into equipment shall not compromise the defined performance of the cables in the presence of the potential hazards,
- (e) where practicable, the fire-resistant route shall be one of the upper tiers of the coordinated high-level services.
- (f) NOTE 1: When coordinating the route for the fire-resistant cables, it must be recognized that some of the other services, such as pipes, ducts, busbars and other cable routes, are likely not to be designed to maintain their integrity under fire conditions and could collapse during a fire. The result of the collapse could be the overloading of the fire-resistant cable containment system, which itself could then fail.
- (g) In order to maximize the integrity of the fire-resistant cable system, fire-resistant and non-fire-resistant cable routes shall be segregated.
- (h) NOTE 2: Such practices could be advantageous when considering the sizing of the cable support systems.
- (i) The cable fixing shall be under the cable manufacturer's recommendations. For example, plastic, nylon, and aluminium cable cleats would not normally be deemed suitable.
- (j) The cable fixing centres shall be within the cable manufacturer's recommended maximum spacings for both the vertical and horizontal runs.
- (k) Cables shall wherever practicable be installed upon the cable support system. Where this is impractical due to the nature of the installation,

the cable may be installed to the underside of the support system, provided the cable fixings are of the equivalent fire rating.

- (l) Segregation may be achieved by a spacing in air of at least 300mm from the runs of cables of other services.
- (m) This spacing applies along the length of cable runs and may be reduced to 15mm at 90° crossovers.
- (n) Multi-core cables servicing emergency lighting circuits shall not be used for any other service.
- (o) NOTE 3: Wiring within a panel is excluded from the requirements of this clause.

11.3 Joints

Joints in cables, other than those contained within the enclosures of equipment, shall be avoided wherever practicable.

Where circuits require the use of junction boxes to house terminations, they shall be capable of maintaining their integrity when tested using the general test protocol and principles in EN 1366-5.

All internal joint connectors shall be of ceramic/porcelain construction and be of a suitable electrical rating and specification for the required purpose.

Joints, other than those made in system components such as luminaires, control units etc. shall be avoided where practicable. Where joints are unavoidable, they should be located in an area of low risk identified by the risk assessment to minimise the risk of early failure in the event of fire.

Joints, other than those made in system components such as luminaires, control units etc, shall;

- (a) Be contained in an enclosure that will have a duration of survival of 90 min when complying with 10.2.2, I.S.3217:2023
- (b) Be contained in an enclosure that will have a duration of survival of 60 minutes when complying with 10.2.3.3 I.S.3217:2023
- (c) For a) and b) the enclosure shall be labelled 'EMERGENCY LIGHTING' or 'EMERGENCY ESCAPE LIGHTING' or 'STANDBY LIGHTING' to avoid confusion with other services.

Jointing of fire-resistant cables shall not be permissible in emergency lighting luminaires unless such luminaires can afford the same protection as the cable in the presence of the potential hazards. Centrally supplied, or 'slave', luminaries used for the jointing of fire-resistant cables shall have a fuse, relay or other protective device on both poles of the supply derived from a CPS.

11.4 Cable support systems

Method of cable support and fixings should be non-combustible and such that the circuit integrity will not be reduced below that afforded by the cable used.

When sizing the support brackets for containment routes, which should support fire resistant cables in a fire condition and where the circuits are to maintain their integrity for a pre-determined period, the drop rods and hangers should be sized to consider the fact that the tensile strength of steel will be reduced in a fire situation.

Failure to observe the design criteria will cause premature collapse of the cable containment system and the circuit failure of the cables being supported.

11.5 Overhead lines

Overhead lines for an emergency lighting system should be avoided. Physical separation of the routing of two circuits shall be so a fault from an external agency causing the failure of one will not interfere with the integrity of the other.

11.6 Damp, corrosive or underground locations

Where an appraisal of the installation location indicates that cables for emergency lighting circuits are to be installed in locations or atmospheres that are wet, damp, or contaminated by corrosive solid or liquid materials, they should have a sheath which protects the cable against such conditions. Where a suitable sheath cannot be obtained, then over-wrapping with, or containment within, a material that will provide suitable protection should be provided.

11.7 Location of central power systems and associated switchgear

Central power systems (CPS) and their associated main switchgear for emergency lighting applications, shall be in protected area(s) and/or compartment(s). The protected area(s) and/or compartment(s) shall have at least a 2-hour passive fire resistance rating. Due consideration should be taken in choosing a location for central power systems and their associated main switchgear in relation to the failure of other systems, structure and/or flooding. The protected area(s) and/or compartment(s) shall be free of other mechanical and electrical plant items and shall be maintained to ensure that correct ambient operating conditions exist in line with the equipment's manufacturer's installation guidelines and operational instructions.

12 Circuit protection

12.1 General

Emergency lighting systems fed from a standby supply, shall comply with the National Rules for Electrical Installations (ET 101), published by The Electro-Technical Council of Ireland.

12.2 Test facility (PERC)

Each emergency lighting system shall have a suitable facility for simulating failure of the normal supply for test. The facility shall not interrupt the normal lighting supply to the area concerned. After the test period the emergency lighting system shall be automatically restored to its normal state. The facility for simulating failures shall be capable of carrying out these tests:

- (a) functional test (typically 20 seconds) but not exceeding 10% of the rated duration (ATS only);
- (b) functional test of 30 minutes and 10 minutes for 3 hour and 1 hour respectively (all test facilities except ATS),
- (c) functional test of 60 minutes (CGU only),
- (d) full duration test of 3 hours (all test facilities).

NOTE1: In the case of non ATS systems, and depending on the size and layout of the building, consideration should be given to the number of emergency luminaires allocated to a manually operated test facility(s) to ensure adequate inspection time.

12.3 Isolation and maintenance hazards

Warning labels shall be provided in positions where they can be readily seen and read. The labels shall state that switching off the normal supply to an emergency lighting system may not make it safe for maintenance.

Such warnings are necessary because, for example, non-illumination of a lamp does not always indicate that a circuit is dead and a circuit still alive could present a hazard to maintenance personnel.

A test for voltage shall be made before touching parts which may be live.

CPS by their inherent design and construction shall not automatically re-energise any electrically downstream circuit or luminaire which has either been manually isolated for safety or which has failed due to a short circuit or overload condition.

12.4 Voltage compatibility of a slave luminaire and a central battery system

12.5 General

These considerations shall be considered to ensure that a slave luminaire is compatible with the central battery supply to which it is connected.

12.6 d.c. only system

Slave luminaires shall be capable of operating over this input voltage range:

- (a) maximum voltage: battery float voltage,
- (b) minimum voltage: voltage at end of duration battery voltage less a further allowance for cabling voltage drop, up to a maximum of 10 % of the system voltage.

For maintained systems, the luminaires shall also be capable of operating continuously at the maximum system voltage plus the r.m.s voltage ripple content of the d.c. supply which should not be above 3.5 %.

12.7 Combined a.c. and d.c. supplied systems

In the d.c. condition the luminaire should operate under 9.5.4.2. In the a.c. condition the luminaire shall operate continuously over this voltage range:

- (a) maximum voltage: the design transformer voltage plus the supply voltage variation plus transformer regulation, not exceeding 11 % total,
- (b) minimum voltage: the design transformer voltage less the supply voltage variation less an allowance for cabling voltage drop up to a maximum of 10 % of the system nominal voltage (refer to EN 50171).

12.8 Fault condition

Protective devices utilised to protect the normal supply and emergency lighting supply to final emergency lighting luminaire sub-circuits, shall be configured so in the event of an electrically downstream short circuit or overload fault, it shall not be possible for any normal supply or CPS emergency lighting supply to re-energise automatically, any such final sub-circuit until the fault is cleared.

13 Choice of emergency lighting systems

13.1 Duration of operation

The emergency escape lighting system shall operate for 3 hours following failure of the supply to the normal lighting.

14 Emergency lighting design procedure

14.1 General

The design process is a critical element of the emergency lighting system development and installation process. It must be carried out by a designer such as a chartered engineer experienced and competent in emergency lighting design, or a professional engineer experienced and competent in emergency lighting design who holds qualification in emergency lighting design of at least a level 6 Award on the National Tender of Qualifications or other competent person

The designer will demonstrate that they are competent to carry out design of emergency lighting systems.

14.2 Determination of requirements

Complete these actions where necessary:

- (a) establish and verify escape routes.
- (b) investigate if you need standby lighting
- (c) establish the requirements for external emergency escape lighting
- (d) determine which areas should be treated as open areas (anti-panic areas)
- (e) determine High Risk Task Areas
- (f) Identify all positions that require emergency escape lighting
- (g) establish circuit and wiring requirements for system type
- (h) confirm a suitable test facility(s) has been included in the design
- (i) specify that the emergency lighting luminaires shall conform to EN 60598-2-22
- (j) specify that the emergency exit signs conform to the pictogram requirements and the luminance requirements of EN 1838:2013
- (k) ensure there are at least two sources of emergency illumination in each escape route compartment

14.3 Design of illuminance

Having determined the positions and areas which to be illuminated by the emergency lighting system, the detailed design should address:

- (a) position emergency luminaires on plan
- (b) determine the mode of operation
- (c) check voltage and possible voltage drop
- (d) verify the mounting height of luminaires
- (e) choose emergency lighting luminaires
- (f) obtain photometric data of the luminaries
- (g) determine maintenance factor
- (h) calculate the illuminance

- (i) check uniformity
- (j) The system shall be designed using zero reflectance.

14.4 Design of system

Complete these actions where necessary;

- (a) determine the emergency lighting system to be used (e.g. central battery, self-contained) and that automatic testing achieves a PERC designation,
- (b) establish mode of operation (e.g. maintained or non-maintained),
- (c) choose the cables for the system
- (d) determine the routes and methods of cable installation,
- (e) check joints in cables, and warning labels
- (f) check cable support systems
- (g) check suitability of wiring and circuit components for any damp, corrosive or underground locations
- (h) check the location of central power systems

NOTE Items d) to h) apply only to central powered systems.

B.3 Structured Cabling IT

- 1.1 Compliance to these standards must be adhered to.
- 1.2 Confirmation of compliance to these standards must be made within all tender replies:
 - (a) Technical Guidance Document B 2024 Volume 1
 - (b) NHS Health Technical Memorandum 05-02: “Guidance in support of functional provisions for healthcare premises”
 - (c) I.S. 10101:2020: National rules for Electrical Installations

2 Containment

- 2.1 The tenderer shall be responsible for the supply and installation of complete cable containment installations to ensure a complete working installation.
- 2.2 The tenderer shall determine any cable containment required all ancillary components as well and supports shall be deemed as included.

3 Cable support

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

4 Basket

- 4.1 Basket shall be of heavy gauge steel construction. The basket body shall be provided with turned in edges for rigidity. Basket shall incorporate fire barriers or

seals to preserve the integrity of the slabs between floor levels on vertical runs and at fire walls for horizontal and vertical runs. The basket manufacturer's set pieces shall complete the installation. All sharp edges and burrs on internal surfaces shall be removed or bushed and painted as necessary to provide a smooth passage for the pulling in of the cables. All basket and fittings shall be manufactured to standards as described in IEC 61537 and manufactured throughout in best quality hot dipped galvanised sheet steel to EN ISO 1461.

5 **Conduit**

- 5.1 Conduit and fittings shall be under IEC 61038. Conduit shall be Heavy gauge, welded, Class 4, hot-dipped galvanised steel, zinc-coated screw threads and zinc bichromate outer coating to comply with EN ISO 1461. Rigid steel conduit and fittings shall conform to IEC 61386 and particularly EN 61386-1

6 **Cable**

- 6.1 All power cabling is to be as per I.S. 10101:2020 and all conductors shall have a cross-sectional area of at least 4 mm², except for data communication cables and comply with the National Cabling standards produced by the HSE. Power cabling shall be separated from other cabling as per EN 50174-2

7 **Segregation of Services**

- 7.1 Cables of various voltages, functions and separate supply sources shall be segregated from each other and spaced sufficiently far apart to eliminate interference between services. The cabling of low voltage (below 50v) may use the same main containment as subject to prior approval and risk assessment.

8 **Mains Connections**

- 8.1 The dedicated 220vac supply, from local distribution boards, for all Comm's Racks and UPS rack mounted panels, to be completed in closed steel conduit containment system and terminated on a surface mounted, non-switched commando socket. Where appropriate a warning notice should be fixed to the main disconnecting device of the general service installation giving warning that its operation will disconnect the supply to the fire alarm system. "WARNING: THIS SWITCH DISCONNECTS THE Comm's Racks".

9 **Comm's Racks and ICT Infrastructure**

- 9.1 The Comm's Racks and ICT infrastructure cabling should comply with the requirements ISO/IEC 11801, IEEE 802.3af, Power over Ethernet (PoE) Standard and EN 50173. The racks are a common size for server and network equipment, with standard dimensions (height, width, depth) and features like adjustable

mounting rails and varying load ratings. Standards and best practices emphasize proper cable organization within the rack using cable combs, velcro, and cable managers to ensure efficient airflow and easy maintenance.

10 **Devices**

10.1 Details and specifications of all equipment, main racks, jack plugs, cabling and patch panels shall be submitted as part of the proposal within the tender submission.

11 **Certification**

12 Key standards include IEEE standards for PoE (802.3af, 802.3at, and 802.3bt), which define power delivery over Ethernet. For cabling, standards TIA-568.2-D-2 and UL 444 address temperature rise and cable heating in PoE applications to be considered in the tender return.

B.4 Disabled Refuge

1.1 Compliance to these standards must be adhered to.

1.2 Confirmation of compliance to these standards must be made within all tender replies:

(a) Technical Guidance Document B 2024 Volume 1.

(b) NHS Health Technical Memorandum 05-02: “Guidance in support of functional provisions for healthcare premises”.

(c) I.S. 3218:2024: FDAS Fire Detection and Alarm Systems

(d) I.S. 10101:2020: National rules for Electrical Installations.

(e) BS 5839 2021 Part 9: Emergency Voice Communication System.

2 **Containment**

2.1 The tenderer shall be responsible for the supply and installation of complete cable containment installations to ensure a complete working installation.

2.2 The tenderer shall determine any cable containment required and all ancillary components as well and supports shall be deemed as included.

3 **Cable support**

3.1 The methods of cable support shall be non-combustible and so circuit integrity will not be reduced below that afforded by the cable used. The cable support should withstand a similar temperature and duration to that of the cable, while maintaining adequate support. The cable support shall be as per manufacturer cable installation specifications

4 **Cable Basket**

- 4.1 Cable Basket shall be installed in the upright position throughout. Cable basket shall not be installed in the inverted position. Cable Basket shall incorporate fire barriers or seals to preserve the integrity of the slabs between floor levels on vertical runs and at fire walls for horizontal runs. The Cable Basket manufacturer's set pieces shall complete the installation. All sharp edges and burrs on internal surfaces shall be removed or bushed as necessary to provide a smooth passage for the pulling in of the cables. All Cable Basket and fittings shall be manufactured to standards as described in BS EN 50085-1:2005 and manufactured throughout in best quality hot dipped galvanised sheet steel to BS EN 10346:2015. Fire Alarm cables installed in cable basket shall be secured to the cable basket using non-combustible fixings.

5 **Conduit**

- 5.1 Conduit and fittings shall be under IEC 61038. Conduit shall be Heavy gauge, welded, Class 4, hot-dipped galvanised steel, zinc-coated screw threads and zinc bichromate outer coating to comply with BS31. Rigid steel conduit and fittings shall conform to BS4568.

6 **Cable**

- 6.1 All cabling is to be as per I.S.3218:2024 and all conductors shall have a cross-sectional area of at least 1 mm², except for data communication cables.
- 6.2 Loops shall be wired using 1.5 mm² / 2 core zero halogen, low smoke, flame retarding cable and meeting the standard laid down in I.S.3218:2024, BS 5839 part 1 2017 and BS 6387 categories C, W and Z LL2E1.5R and BS8434: 2003.
- 6.3 Loops shall not be teed under any circumstances and loop installation shall be planned to accomplish this. 4-core cables and junction boxes shall not be utilised as defined per the requirements of I.S.3218:2024.

7 **Segregation of Services**

- 7.1 Cables of various voltages, functions, and separate supply sources shall be segregated from each other and spaced sufficiently far apart to eliminate interference between services.
- 7.2 The cabling of extra low voltage (below 50v) emergency lighting systems may use the same main containment as that of Fire Alarm loop wiring subject to prior approval and risk assessment.

8 Mains Connections

- 8.1 The dedicated 230vac supply, from local distribution boards for all fire alarm panels and fire alarm repeater panels, shall be completed in closed steel conduit containment system and terminated on a surface mounted brushed stainless metal clad un-switched fused outlet c/w neon.
- 8.2 A warning notice shall be fixed to the main disconnecting device of the general service installation giving warning that its operation will disconnect the supply to the fire alarm system. “WARNING: THIS SWITCH DISCONNECTS THE REFUGE EVCS SYSTEM”.

9 Certification

Certification is required for the Disabled Refuge system to include:

- (a) Design; and
- (b) Installation; and
- (c) Commissioning; and
- (d) Verification/ Handover

B.5 Fire Stopping Systems

Design

- (1) The detailed design and installation of all of the fire stopping systems, fire collars, etc. is to meet the performance requirements set out within the granted Fire Safety Certificate, relevant standards EN1366.
- (2) Testing/Certification - Contractor shall implement a traceable fire-stopping record for the building as part of the works. The fire-stopping record shall comprise a uniquely labelled fire-stopping tag number associated with the element of fire-stopping work which is linked to the approximate location where the work has been carried out. The tag shall identify the element of fire-stopping work e.g. fire collar, fire wrap, fire batt seal or linear fire mastic seal (or combination of same). It shall also approximate the amount of fire-stopping materials and types of materials used. This shall be provided by the Specialist fire-stopping company engaged by the contractor on the project.
- (3) Each fire-stopping location shall also be photographed and linked to the fire-stop tag so that all fire-stopping elements can be tracked and identified now and in the future.
- (4) The fire-stopping record shall be transferred digitally to the Client upon completion as part of the fire-stopping certification documentation provided for the project.

- (5) An online specialist fire-stopping system which automatically links a fire-stopping location with a photograph, tag identifier and a tag location by way of pdf drawing for the project is the minimum acceptable standard.
- (6) It is the responsibility of the contractor to ensure that all fire-stopping record files are kept up to date and are readily accessible throughout the duration of the project and for future reference.
- (7) The Contractor shall provide details of all fire-stopping products used. These should be CE marked, comprise third party certification i.e. Exova Certifire (or similar test centre approved) and certified by way of fire test to;
 - (I) BS EN 1634-1:2014 A1:2018;
 - (II) IS EN 1366 Part 3: 2009 - Penetration seals;
 - (III) IS EN 1366: Part 4: 2006 + A1:2010, fire resistance tests for service installations linear joint seals, or
 - (IV) IS EN 1366 Part 5: 2010 – Service Ducts or Shafts) to meet the specified fire resistance standard as set out within the approved Fire Safety Certificate Design Drawings and the requirements set out within the approved Fire Report associated with the project.
- (8) All fire-stopping products used shall be accompanied with appropriate test/certification documentation which shall be valid i.e. within the certification time period established by the test centre.
- (9) All fire-stopping shall be carried out by a competent third party certified fire-stopping contractor in accordance with the relevant ASFP guidelines/manufacturers installation recommendations.
- (10) All fire-stopping products used shall be fit for purpose and installed in accordance with the manufacturer's recommendations.
- (11) The Contractor shall confirm that all service sub-contractors i.e. electrical service providers (electricians, fire alarm providers, comms service installers) and mechanical service providers (plumbers and ventilation service providers) are aware of the location of all fire barriers within the building and the requirements of fire-stopping needed within the building. Any breach of fire barriers shall be the full responsibility of the Contractor
- (12) A hard copy of the Fire Stopping Details and the Fire-stopping Compliance Declaration Document shall be available on site at all times throughout the duration of the project for sub-contractor consultation and review.
- (13) The Contractor shall provide all sub-contractors with a digital copy of the Fire Stopping Details and the Fire-stopping Compliance Declaration Document in advance of works.

- (14) It is the responsibility of the Contractor to identify any variations or alterations to the Fire Stopping Details and the Design team's Fire-stopping Compliance Declaration Document is highlighted to the respective sub-contractor to avoid incorrect or missed fire-stopping installations.
- (15) The separation of fire-stopping responsibilities should be avoided at all costs and the fire-stopping should be conducted under one package of fire protection works to avoid gaps in the level of fire protection and certification provided.
- (16) A fire-stopping responsibility matrix shall be prepared by the Design team to clearly identify the fire protection responsibility for all fire resisting elements
 - (I) Structural Steel Protection – Specialist Fire-stopping Specialist /Partition contractors
 - (II) Fire Resisting Walls - Partition contractor
 - (III) Fire Door Installations – Specialist Fire-stopping Specialist/Fire Door Installer
 - (IV) Electrical Service penetrations (various electrical disciplines) – Specialist Fire-stopping contractor
 - (V) Mechanical Service penetrations (various disciplines) – Specialist Fire-stopping contractor
 - (VI) Fire Damper penetrations – Specialist Fire-stopping contractor

B.6 Aspergillosis – Infection Control

This should be read in conjunction with Tables and the Tender Drawings

26045-XX-L00-DR-FCC-FS-1001_WT

26045-XX-L01-DR-FCC-FS-1002_WT

26045-XX-L02-DR-FCC-FS-1003_WT

26045-XX-ZZZ-DR-FCC-FS-1004_WT

1.0 Inspection Works Procedures

Type A1- Works

Description:

The successful Contractor will carry out detailed survey works, prior to the commencement of the project. This will have no direct impact on Staff or Hospital processes. It will allow for a more detailed installation schedule to be produced, to minimise disturbance to the Hospital.

This survey shall involve a visual inspection of areas and proposed cable routes. At this stage of the works, it will not involve the drilling of any holes which may cause the creation of any dust. This survey will involve the removal of ceiling tiles for inspection purposes only above voids. In line with the Guidelines only 1 tile per 5sq m. will be removed and replaced once inspection is completed.

Equipment:

Safety Signage, A-Frame Ladder & Light

1.1 Coring Access Holes Procedures where Patients are Present

Type A2- Works

The following are examples of Coring of Access Holes in Ward Areas and the minimum precautions required to carry out these works.

Control Measures

Description:

Works can only be carried out once method statement has been approved and notifications issued by Maintenance Dept. and Infection Control personnel.

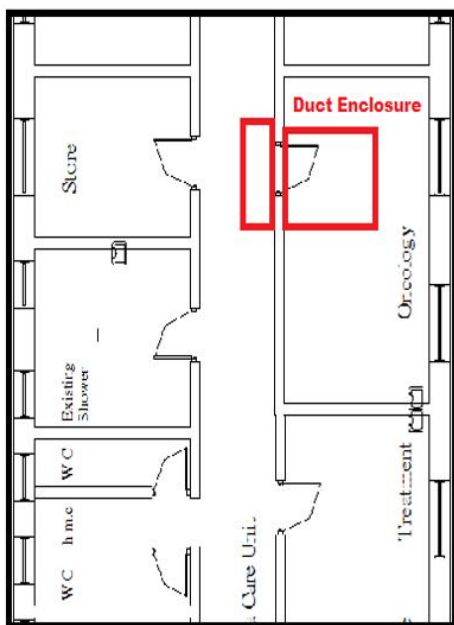
A temporary enclosure will be erected in the room where the Access Holes are required to be installed and against the wall in the corridor outside the room to facilitate drilling out through the walls into the corridor. All drilling within the rooms will take place inside this enclosure with a HEPA filter vacuum cleaner. This enclosure will be demonstrated to hospital Clerk of Works and Infection Control prior to works commencing. Where this is not possible, rooms will be sealed off with duct tape for the duration of the drilling. Seals will be inspected at regular intervals. Sticky mats will be used on the floor inside the partition to catch any dust on the shoes of engineers.

A 25mm hole will be drilled from the rooms into the corridor to allow for cable entry into the room. HEPA filter vacuums will be used when drilling is taking place.

Equipment

Safety Signage, Temporary Enclosure, Sticky Mats, Duct Tape, Core Drill, Specialist dust-reducing Drill Bits, & HEPA Filter vacuum cleaners.

Illustration of Enclosure System



Example of Enclosure in operation



Specialist Dust-Reducing Drill Bits



1.2 Installation of New Containment in Corridors where Patients are Present

Type A2- Works

New Containment in Corridor Areas and the minimum precautions required carrying out these works

Control Measures

Description:

The installation of Containment, this will be installed in all main corridor ceiling voids. This will form the basis of the main cabling systems. This containment will be installed using specialist fixings, which will reduce dust and noise generation. All detection and lighting points will be wired from this Containment.

The installation of this Containment will require access to all corridor areas. This work will be carried out at ceiling level. Firstly supports will be affixed at regular intervals. Where possible all fabrication will be carried out in Contractors compound, again this will reduce dust generation. To install this containment ceiling tiles will **need to be dropped two at a time at regular intervals** to gain access to voids. As this requires more tile removal than recommended in the Guidelines, temporary enclosure will be required and **dust covers placed to cover void where ceiling has been dropped**. Prior to the removal of tiles, risk classification of patients must be sought and the minimum amount of tiles will be removed at any one time. All cabling will be installed and securely fastened before tiles are replaced.

Equipment

Safety Signage, Temporary Enclosure, Sticky Mats, Duct Tape, Drills, Specialist Dust-reducing Drill Bits, & HEPA Filter Vacuums.

Specialist Dust-Reducing Drills

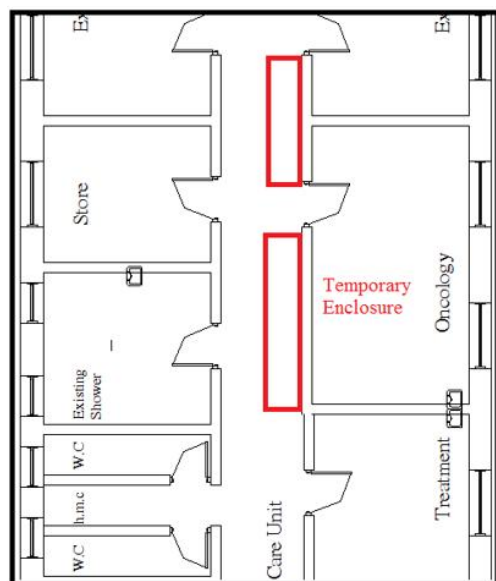
TE DRS-M Dust Removal System



Hilti T6 drill wit Dust Catching



Illustration of Enclosure System



Example of Movable Enclosure in operation



1.3 Installation Works in Ward Areas where Patients are Present

Type A2 Works

Minimum Control Measures

Description:

The installation of the 20\25mm steel conduit would involve working at ceiling level. All pipe work would be fixed to the ceiling with the use of special fixings. This would require the drilling of 5.5mm holes. To reduce dust generation specialist drilling equipment shall be used and an additional HEPA Filter vacuum cleaner, to ensure **no dust infiltration** into any other Ward areas. This may involve the use of hammer action drills, which will produce an unavoidable level of noise. To reduce disturbance to both staff and patients, all works will be completed on an area by area basis. Due to restricted access, normally all pipe fabrication will be carried out off site.

Equipment

Safety Signage, Temporary Enclosure, Sticky Mats, Duct Tape, Drills, Specialist Dust-reducing Drill Bits & HEPA Filter Vacuum Cleaners.

Specialist Dust-Reducing Drills

TE DRS-M Dust Removal System



Hilti T6 drill wit Dust Catching



HEPA Filter Vacuum Cleaner

HEPA filter



1.4 Cleaning

In addition to minimising dust through measures outlined above where patients are present and in all areas of the Hospital, the contractor must provide for strict cleaning regimes to prevent dust accumulation on surfaces, ceilings and air ducts grilles to the satisfaction of Infection Control Personnel. As the quantity of dust generated will vary depending on the type of building activity, the increased cleaning regimes need to be adjusted accordingly to minimise dust accumulation.

“Damp Dusting” not dry cleaning is required.

Where vacuum cleaners are used, these should be equipped with HEPA filters and appropriately maintained to minimise dust dispersal. Filters in the vacuum cleaners need to be changed regularly and a record/log should be kept of these changes.

All maintenance / construction staff should wear appropriate PPE clothing and masks.

At-risk patients may be categorised as outlined below.

Group 1 – No evidence of risk

1. Staff members, service providers and contractors
2. All patients not listed in Groups 2-4 below.

Group 2 – Increased risk

1. Patients on prolonged courses of high dose steroids particularly those hospitalised for prolonged periods
2. Severely immunosuppressed AIDS patients
3. Patients undergoing mechanical ventilation
4. Non-neutropenic patients on chemotherapy
5. Dialysis patients

Group 3 – High Risk

1. Patients with neutropenia less than 14 hours following chemotherapy
2. Adult acute lymphoblastic leukaemia patients on high dose steroid therapy

3. Solid organ transplantation
4. Patients with Chronic Granulomatous Disorder
5. Neonatal intensive care units
6. COPD patients meeting GOLD stage III and IV criteria
7. Patients with extensive burns

Group 4 – Very High Risk

1. Allogenic haematopoietic stem cell transplantation
 - a. During the neutropenic period
 - b. With graft-versus-host disease requiring +/- other immunosuppressive therapy
2. Autologous haematopoietic stem cell transplantation, i.e. During the neutropenic period
3. Non-myeloablative transplantation
4. Children with severe combined immunodeficiency syndrome (SCID)
5. Prolonged neutropenia for greater than 14 days following chemotherapy or immunosuppressive therapy (including acute myeloid leukaemia)
6. Aplastic anaemia patients

Details of the type of construction project activity,

Type	Description of the activity
TYPE A1	Minor internal containable activities with no/minimal dust generation This includes, but is not limited to, inspection and non-invasive activities and small-scale activities that create minimal dust. These include, but are not limited to, activities that require removal of ceiling tiles for preliminary visual inspection (limited to 1 tile per 5m ²), painting (no sanding), wall covering, electrical trim work, minor plumbing and other maintenance activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
TYPE A2	Minor internal small-scale works with some dust generation that can be contained This includes, but is not limited to, minor works on a small scale where dust containment is achieved by using dust barriers and a HEPA-filtered vacuum. Activities that require access to conduit spaces, cutting of walls, woodwork or ceilings where dust migration can be controlled for installation or repair of minor electrical work, ventilation components, telephone wires or computer

	cables. It also includes minor plumbing as well as minor drilling to allow for the erection of brackets and shelving.
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Matrix of construction project activity type, patient risk group and class of required infection prevention and control precautions

	Construction Activity Type				
Patient Risk Group	TYPE A1	TYPE A2	TYPE B	TYPE C	TYPE D
Group 1 – No evidence of risk	0	I	I	III	III
Group 2 – Increased risk	0	I	II	III	III
Group 3 – High risk	I	I	II	III	III
Group 4 – Very high risk	I	I	II	III	III

Description of the required infection prevention and control precautions by class (please see below for application of relevant Class of Preventive Measures required)

Class 0 Preventive Measures
Dust Control - Immediately replace ceiling tiles for preliminary visual inspection Cleaning - Wet mop and vacuum area as needed and when work is completed - Wipe horizontal and vertical work surfaces with hot soapy water Infection Prevention and Control Personnel - Approval to be sought from IPCT for the construction activity Patient Risk Reduction - Minimise exposure of patients in at-risk Group 2 to the construction/renovation area - Minimise dust and increase cleaning in patient area

Class I Preventive Measures
Dust Control - Immediately replace ceiling tiles displaced for visual inspection - Execute work by methods to minimise dust generation from construction or renovation activities

- Provide active means to minimise dust generation and migration into the atmosphere

Cleaning

- Wet mop and vacuum area as needed and when work is completed
- Wipe horizontal and vertical work surfaces with hot soapy water

Infection Prevention and Control Personnel

- Approval to be sought from IPCT for the construction activity and the permit to be issued
- In collaboration with cleaners and technical services, ensure that the construction zone remains sealed and that the cleaning is adequate at all times

Patient Risk Reduction

- Move at-risk patients (Groups 2-4) away from construction zone. If it is not possible to move e.g. ICU patients, an impermeable dust barrier should be erected around the construction zone.
- Minimise patients' exposure to the construction/renovation area
- Minimise dust and increase cleaning in patient area



B. ENDER DRAWINGS

1 Tender Drawings

Please find enclosed the following tender drawings (“Tender Drawings”):

Tender Drawing Schedule

Drawing No.	Description	Size	File Type	Scale	Issued
	WORKING TIMES				
26045-XX-L00-DR-FCC-FS-1001-WT	Ground Floor Plan (WT)	A1	PDF	1:150	25/09/2026
26045-XX-L01-DR-FCC-FS-1002-WT	First Floor Plan (WT)	A1	PDF	1:150	25/09/2026
26045-XX-L02-DR-FCC-FS-1003-WT	Second Floor Plan (WT)	A1	PDF	1:150	25/09/2026
26045-XX-L00-DR-FCC-FS-1004-WT	Outbuildings Floor Plans (WT)	A1	PDF	1:150	25/09/2026
	REFLECTED CEILINGS				
26045-XX-L00-DR-FCC-FS-2001-RC	Ground Floor Plan (RC)	A1	PDF	1:150	25/09/2026
26045-XX-L01-DR-FCC-FS-2002-RC	First Floor Plan (RC)	A1	PDF	1:150	25/09/2026
26045-XX-L02-DR-FCC-FS-2003-RC	Second Floor Plan (RC)	A1	PDF	1:150	25/09/2026
26045-XX-L00-DR-FCC-FS-2004-RC	Outbuildings Floor Plans (RC)	A1	PDF	1:150	25/09/2026
	FIRE DETECTION ALARM SYSTEM (FDAS)				
26045-XX-L00-DR-FCC-FS-3001-FDAS	Ground Floor Plan (FDAS)	A1	PDF	1:150	25/09/2026
26045-XX-L01-DR-FCC-FS-3002-FDAS	First Floor Plan Block (FDAS)	A1	PDF	1:150	25/09/2026
26045-XX-L02-DR-FCC-FS-3003-FDAS	Second Floor Plan (FDAS)	A1	PDF	1:150	25/09/2026
26045-XX-L00-DR-FCC-FS-3004-FDAS	Outbuildings Floor Plans (FDAS)	A1	PDF	1:150	25/09/2026
	EMERGENCY LIGHTING SYSTEM (ELS)				
26045-XX-L00-DR-FCC-FS-4001-ELS	Ground Floor Plan (ELS)	A1	PDF	1:150	25/09/2026
26045-XX-L01-DR-FCC-FS-4002-ELS	First Floor Plan (ELS)	A1	PDF	1:150	25/09/2026



Invitation to Tender – Monaghan General Hospital, Co. Monaghan

26045-XX-L02-DR-FCC-FS-4003-ELS	Second Floor Plan (ELS)	A1	PDF	1:150	25/09/2026
26045-XX-L00-DR-FCC-FS-4004-ELS	Outbuildings Floor Plans (ELS)	A1	PDF	1:150	25/09/2026
	NETWORK SCHEMATIC (NS)				
26045-XX-ZZZ-DR-FCC-FS-5001-NS	Fire Alarm Network Schematic (NS)	A3	PDF	NTS	25/09/2026
26045-XX-ZZZ-DR-FCC-FS-5002-NS	Fire Alarm Network Schematic (NS)	A3	PDF	NTS	25/09/2026
	Fire Alarm Panels (FAP)				
26045-XX-L00-DR-FCC-FS-6001-FAP-NODES-NA	Ground Floor Plan (FAP- NODES)	A1	PDF	1:150	25/09/2026
26045-XX-L01-DR-FCC-FS-6002-FAP-NODES-NA	First Floor Plan (FAP- NODES)	A1	PDF	1:150	25/09/2026
26045-XX-L02-DR-FCC-FS-6003-FAP-NODES-NA	Second Floor Plan (FAP- NODES)	A1	PDF	1:150	25/09/2026
26045-XX-L00-DR-FCC-FS-6004-FAP-NODES-NA	Outbuildings Floor Plans (FAP- NODES)	A2	PDF	1:150	25/09/2026
	Emergency Standby Lighting (ESBL)				
26045-XX-L01-DR-FCC-FS-7002-	Emergency Standby Lighting	A1	PDF	1:50	25/09/2026
	WIFI and DAS				
26045-XX-L00-DR-FCC-FS-8001-WIFI-DAS	Ground Floor Plan (WIFI and DAS)	A1	PDF	1:150	22/09/2026
26045-XX-L01-DR-FCC-FS-8002-WIFI-DAS	First Floor Plan (WIFI and DAS)	A1	PDF	1:150	22/09/2026
26045-XX-L02-DR-FCC-FS-8003-WIFI-DAS	Second Floor Plan (WIFI and DAS)	A1	PDF	1:150	22/09/2026
26045-XX-L00-DR-FCC-FS-8004-WIFI-DAS	Outbuildings Floor Plans (WIFI and DAS)	A1	PDF	1:150	22/09/2026
	Disabled Refuge				
26045-XX-L01-DR-FCC-FS-8002-DR	First Floor Plan (Disabled Refuge)	A1	PDF	1:150	22/09/2026
26045-XX-L02-DR-FCC-FS-8003-DR	First Floor Plan (Disabled Refuge)	A1	PDF	1:150	22/09/2026



PRICING SCHEDULE (ATTACHED VOLUME C)

Monaghan General Hospital Compulsory Pricing Document

Volume C Pricing Document



**CONTRACT: REFER TO GOVERNMENT PUBLIC WORKS
CONTRACT PW-CF2 (Attached)**

