

PROJECT: Cashel FET Centre, Hogan's Square, Co, Tipperary

TEM CONTRACT No: 18572

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Electrical Specification

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Location	Hold	Action	By

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1 INTRODUCTION

1.1 Form of Contract

The contract conditions are as outlined in this document and in this contract the Electrical contractor shall act as a nominated subcontractor to the main contractor, and all works shall be carried out in accordance with this specification and associated drawings. The works covered by this Specification includes the Electrical Installation for Cashel Further Education and Training Centre in Cashel, Co. Tipperary and these works shall be carried out with this specification and all associated drawings and in-line with the conditions and in conjunction with the main contract and main contractor.

1.2 Nature of Contract

The Electrical tenderer will act as a nominated subcontractor under the main contractor yet to be appointed under the contract. The contract shall be determined by the Quantity Surveyor.

1.3 Main Contract Conditions

The following conditions shall apply to this contract:

- Public Liability Insurance policies are to be maintained until the issue of the Certificate of Final Completion of the works by the Employers Representative under this Contract.
- Before the work commences on the site the Electrical Contractor will be required to produce a letter in clear terms from his insurance company or brokers to the effect that they are insured in accordance with the terms of this Contract.
- In the event of the Electrical Contractor's failure to satisfy the Employer that he is so insured the Employer will immediately operate the remedies provided within the terms of this contract.

1.4 Tender Documents

The Tender documents comprise the documents listed in our document 'Schedule of Documents / Transmittal Sheet'. The Tenderer is requested to check the documents and the number of each page and if any are missing or duplicated, or if any writing or figures are indistinct to notify at once the Consultant. No subsequent claim for loss consequent upon the Tenderers failure to comply with this Clause will be entertained.

1.5 Materials Costs and Deliveries

At the commencement of the works the Electrical Contractor shall confirm that deliveries of all materials can meet the programme requirements. On claiming an increase in material costs,

he shall produce satisfactory proof of such variation, the acceptance of which shall be at the discretion of the Engineer. In the case of imported materials, costs shall be stated in Euro's and the currency exchange rate at tender date shall be stated in the tender return.

1.6 Labour Hourly rates and Time Sheets

The Electrical Contractor shall produce a Schedule of current net hourly rates as laid down by the appropriate regulating body and current on the designated date. Time Sheets recording the total hours worked by each operative per day must be submitted for signature to the Engineer or his representative weekly. No claims will be considered unless this clause is strictly adhered to.

1.7 Tender Price

Should a discrepancy exist between the tender price quoted in figures and words, the words shall take precedence over the figures. The tender price is to include the provision of all equipment, materials, carriage, customs, tools, plant, carriage and labour including all levies and productivity and welfare payments, unless otherwise specified in this Specification.

Value Added Tax is to be excluded from the Contract sum, but identified as a separate item.

1.8 Delivery of Tenders

Tenders shall be returned to the Client as stated on the tender invitation.

1.9 Other definitions

The "Contract Documents" shall mean the Form of Contract, this Specification and Conditions and the Form of Tender, the drawings relating to the work and the letter accepting the Tender.

The terms "approved" "directed" and "selected" shall mean the approval of or considered necessary, equal or required by the Consulting Engineer.

The terms "supply" and/or "provide" shall unless otherwise stated, include both supply and fixing.

1.10 Specification Structure

This specification is divided in the following parts:

INTRODUCTION: it presents general understanding about the specification, form of contract and tender return.

KEY PROJECT ENTITIES: it presents the client and companies involved in the design. In this section is also showed the terms/definitions for main contractor and electrical contractor.

SCOPE: it defines all elements which the contractor shall consider for tender.

BOUNDARIES: it sets out the boundaries/limits of works for tender.

MAIN TECHNICAL CHARACTERISTICS: It presents the main technical characteristics. For more detailed information, contractor shall consult the equipment schedule and drawings.

TECHNICAL SPECIFICATION: it covers all other data/information not presented in previous sections and other associated documents.

SPECIFICATION SCHEDULES: it presents other documents to be consulted.

TENDER SUMMARY: It presents the structure for tender pricing.

1.11 Site Visit

The Electrical Contractor, prior to submitting his tender, is recommended to visit the site, and ascertain for himself the means of access thereto and any other factors which may affect his tender, as no claim will be allowed on account of his not having done so.

1.12 Engineers Drawings

The Electrical Contractor shall be deemed to have examined all drawings on the project (Electrical, Electrical, architects & structural) and no claim for additional payment shall be entertained arising from lack of information.

1.13 Omissions and Anomalies

Should a tenderer find omissions or anomalies a request for clarification should be made to Engineer, prior to tender return.

Such clarifications shall be confirmed in the form of Addendum, receipt of same must be recorded in the appropriate section of this Specification. Where anomalies between Drawings and Specifications do not come to light until the contract stage, then the Electrical Contractor shall provide the goods or perform the work to the higher standard as ruled by the Engineer.

1.14 Compliance with Specification

The Tender Sum shall include for equipment and materials PRECISELY AS SPECIFIED. Should the Electrical Contractor wish to offer "equivalent" equipment or materials to those specified, such equipment or materials shall not be included in the main tender, but offered in the form of a Supplementary Schedule with details of the Manufacture, Specification and cost or delivery advantage.

For his tender to receive consideration the Tenderer shall complete in full the Schedule of Manufacturers and delivery periods section of this Specification.

Subject to compliance with this Specification in respect of Standard Specifications, materials shall, where possible be manufactured and assembled in Ireland.

The Electrical Contractor shall, upon the request of the Consulting Engineer, furnish him with vouchers to prove that the materials comply with the requirements of the appropriate paragraph of this condition.

1.15 Quotation to be Inclusive

The price quoted will be held to include for the supply and delivery on the site of all necessary material and for all work, material matters including bonus or other incentive payments to the workforce and things reasonably required for the due and proper carrying out and completion of the work according to the true intent and meaning of this Specification and the drawings (if any) taken together, whether specifically mentioned herein, or shown on the drawings or not.

1.16 Trade Names

Where Trade Names are given, it is to be clearly understood that such references are inserted for the guidance of the Electrical Contractor with respect to the nature and quality of the articles or services required. The Electrical Contractor is free to offer alternatives provided they fully comply with the Specification of the specified goods and subject to the written approval of the Engineer.

1.17 Compliance with Regulations

The Electrical Contractor is to guarantee that his work will comply with all regulations, Building Regulations, bye-laws, Acts of Government and other requirements of any Local Authority, Statutory Undertaking, Factory Inspector, Insurance Company, or any other authority whatsoever. No additional cost will be allowed to the Contractor after receipt of his tender for compliance with this Clause.

1.18 Site Meetings/Visits

The consultant shall visit site to inspect the works; the contractor is advised to deal with any queries at this time.

1.19 Sub-letting

The Electrical Contractor shall not assign the Subcontract or sub-let any portion of the work without the written authority of the Engineers, except where sub-letting is expressly called for in this Specification. The Tenderer shall state in his tender return the names of all firms to whom he proposes to sub-let portions of the work, for the Engineer's approval. Approval of the sub-letting by the Engineer and Contractor shall not relieve the Electrical Contractor of any of his obligations under this contract. The Electrical Contractor shall be responsible for the programming and execution of all the work sub-let.

1.20 Reading of Specification

Items 2, 3 and 4 of this specification give data/orientation about the specific requirements for the project. Scope of works shall be considered according those three items.

Other parts shall be consulted for more detailed information, but it can have more systems described than the required on the scope and the reader shall consider the parts which the scope applies.

2 KEY PROJECT ENTITIES & SITE LOCATION

2.1 Key Project Entities

Key project entities are:

Entity	Name
Client:	Tipperary Educational & Training Board
Architect/Project Manager	Spentide Architecture & Project Management
M&E Services Consulting Engineers	TEM Engineering & Management DAC

Other key entities mentioned in this document:

- Main Contractor or Building Contractor: The firm appointed to carry out the building works.
- Electrical Contractor: The firm appointed to carry out the electrical works.

2.2 Description of Site

The sites is located at Cashel Further Education and Training Centre – Hogan Square, Cashel, Co, Tipperary.

3 SCOPE OF WORKS

The scope of works is comprised of:

Definitions:

- Electrical Contractor – EC;
- Not Applicable – NA.

Item	Description	Scope
1	Preliminaries	EC
2	Site Services (Element 60)	NA
3	Electrical Supply and Main Distribution (Element 61)	EC
4	Power (Element 62)	EC
5	Lighting (Element 63)	EC
6	Security and Protection (Element 65)	EC
7	Other Services (Element 68)	EC

Notes:

1. The elements described above follow the “Capital Works Management Framework” document “How to use the Costing Document+ (Building Works) – CO 1”.

4 BOUNDARIES

All electrical services to be included.

5 MAIN TECHNICAL CHARACTERISTICS

This section presents the main technical characteristics for all elements. The contractor shall include any miscellanea needed for the perfect running of the systems, even if it's not listed below.

5.1 Preliminaries

Typical preliminaries services/preparation for the development of all elements.

5.2 Site Services (Element 50)

Building mounted light fittings to be provided as indicated on drawings. The external lighting comprises of IP65 rated L.E.D. fittings.

5.3 Electrical Supply and Main Distribution (Element 61)

A Periodic Inspection report to be carried out on all main boards and sub distribution boards in both buildings.

5.4 Power (Element 62)

Where new electric heaters have been installed new power supplies will be required. For existing power supplies to new electric radiators, new under-sink water heaters and new electric hot water cylinder, existing power supplies will be reused. Contractor to include for the disconnection of the existing electrical heaters and the strip out and the removal of same.

5.5 Lighting (Element 63)

New light fittings will be installed on each floor of each building. These will comprise a combination of dimmable LED fittings with absence/daylight sensors.

It is intended to re-use all the existing wiring where possible, subject to the outcome of the Periodic Inspection Report.

Emergency lighting system for the Cashel Further Education and Training Centre will be retained and shall continue to serve the building.

5.6 Security and Protection (Element 65)

Fire Detection and Alarm System

The existing fire detection and alarm system at the Cashel Further Education and Training Centre shall be retained and shall continue to serve the building.

New fire detection devices shall be provided only where indicated on the drawings. All new fire alarm devices shall be compatible with the existing fire alarm system.

Any new fire alarm wiring shall be installed within dedicated containment using fire-rated cabling and shall be designed, installed, tested and commissioned in accordance with I.S. 3218 – Fire Detection and Alarm Systems for Buildings, HSA legislation, the Building Regulations, and all relevant Government Circulars and Publications.

5.7 Other Services (Element 68)

Bonding of all extraneous metal conductors will be required particularly where the new electric under sink heaters and hot water cylinder are being provided, the contractor is to ensure that bonding is provided to the water services pipework in the vicinity of the works.

6 DEVELOPMENTS OF WORKS

6.1 Specialist Equipment

It shall be the sole responsibility of the Electrical Contractor to ensure that all special equipment conforms in every detail to all relevant clauses of this Specification.

The Electrical Contractor shall note that he is to inform Specialist Manufacturers and Suppliers of the full intent of the terms and conditions of this Contract and that they will be bound to these terms and conditions of contract, as will be the Sub Contractors.

The Electrical Contractor is advised to check all suppliers of specialist equipment that the boilers, burners, starting equipment etc., contained in their offer are in full accordance with the Consulting Engineers' requirements.

6.2 Royalties

The Electrical Contractor shall indemnify the Consulting Engineers from and against all claims and expenses which may be brought or made against them by reasons of the Electrical Contractor infringing or being held to have infringed any Patent Rights or non-payment of any articles, processes and inventions, and in the event of any injunction being obtained against the use of same, the Electrical Contractor shall forthwith replace the same, by other materials or appliances to the satisfaction of the Engineers without extra cost, and in addition shall be responsible by way of damages by reason of any delay occasioned thereby in the execution of the work.

6.3 Bill of Quantities

The Electrical Contractor shall within 7 days of being requested, submit to the Engineer a detailed schedule of rates covering every item fixed, as specified, upon which the Electrical Contractor's estimate has been based.

The number of items and quantities shall be given and extended to form a Bill of Quantities adding up to the totals as indicated in the Tender Summary. The Bill of Quantities shall remain with the Engineer until the works are completed and shall form the basis for agreement of variations by measurement. However, the contract is a lump sum contract, and is not subject to re-measurement.

The tenderer is to submit a priced Bill of Quantities in accordance with ARM 4 Supplement 2 with his tender.

6.4 Contractor's Work Co-Ordination

Before any work is commenced on site the Electrical contractor shall agree all pipe routes necessary to complete the works.

6.5 Record and Working Drawings

When the installation is complete, the Electrical Contractor shall supply a set of Record Drawings showing the layout of the installation as installed. Three sets of white prints, coloured to assist interpretation, together with a set on CD shall be provided. Drawings shall be handed over to the Engineers for checking and their approval obtained before final printing. The information contained on the Electrical Contractor's working drawings shall be incorporated on the Record Drawings. Additionally, a Maintenance Manual shall be provided by the Electrical Contractor as specified.

In the event of failure by the Electrical Contractor to produce approved Record Drawings and Manuals, the Engineer may deduct up to 1% of the Contract value to cover the costs of having the site surveyed and the record documents produced on behalf of the Client.

6.6 Labelling

The Electrical Contractor shall be responsible for labelling and circuitry charts for all items of Electrical plant.

6.7 Agreement of Programme

The programme for the works will be as outlined in the PQS data. The Electrical contractor will ensure that he has the adequate resources available at each stage of the programme where the electrical works will be completed.

6.8 Materials and Equipment Delivery Schedules

Once the Electrical Contractor has been confirmed by the Main Contractor the Electrical Contractor will confirm delivery dates for all Electrical equipment and accessories.

6.9 Co-ordination

The Electrical Contractor shall familiarise himself with the details of the location and routes of other building services and he shall, co-ordinate his work with such services. Failure of the Electrical Contractor to co-ordinate his works shall involve the Contractor re-arranging installed works to the satisfaction of the Engineer and at the Contractor's expense. When preparing his tender the Contractor should inspect the drawings.

6.10 Contracts Manager & Foreman

The Contracts Manager or Foreman shall be approved by the Engineers, which approval may be at any time withdrawn, given sufficient reason. The Contracts Manager or the Foreman, whose name shall be set out in writing by the Contractor, shall be maintained constantly on the works, and he shall not be changed except with the written approval of the Engineer. Such Contracts Manager shall be authorised on the Contractor's behalf to receive instructions from the Engineer and shall give his whole time to the superintendence of the work. He shall keep

accurate records and details of all installed works and shall furnish the Consulting Engineer with all particulars demanded. The Contracts Manager and Foreman shall not be transferred off site without the agreement of the Engineer.

6.11 Site Management & Staff

The Contractor shall include for providing from the outset, and maintaining permanently on site a contracts manager, Foreman and chargehands as required, to effectively fulfil the requirement for management of the site and workforce to the satisfaction of the Engineer.

The Contractor shall submit with his tender a labour histogram incorporating management structure proposal for the project. The Contractor shall name the senior personnel who shall be responsible for a management of the project. The labour histogram shall include man/hour levels for each main area and a graph showing labour force build-up, peak and run down.

6.12 Materials and Workmanship

The standards for materials and workmanship shall be as specified in the relevant sections of this Specification and as shown on the Drawings. Items of equipment generally shall comply with the relevant National, European and International Standards laid down in the specification

6.13 Setting Out

The position of all fittings, pipes, equipment machinery apparatus etc., indicated on the drawings are to be taken as approximate only and are intended to indicate generally the arrangement of the works under this Contract.

The Electrical Contractor shall be held responsible for notifying the Consulting Engineers for any discrepancy between the Specification, Schedules and Drawings.

Should any portion of the works, which would reasonable and obviously be inferred as necessary for the complete, safe and satisfactory operation of the installation as a whole, not be expressly described or specified, the Contractor shall provide and execute such works as part of the Contract and shall not be entitled to any extra payment on that account.

The exact positions of all fittings, equipment and apparatus and all pipe routes shall be verified by the Contractor on the site and approved by the Engineer/Architect or Clients Representative prior to installation.

6.14 Builders Work through Structure

Should it be required to cut or drill any of the structural steelwork the Contractor shall obtain the approval of the Consultant in writing before any such cutting and drilling is carried out.

The Contractor shall include in his Tender for all drilling and cutting of structural steelwork where required, but such drilling or cutting shall be witnessed by the Engineer.

The contractor is responsible for all builders work necessary to complete the works. Where cables are routes and penetrate existing fire compartments the contractor is to re-seal same with a suitable fire seal.

6.15 Clear Work Areas

The Electrical Contractor shall at all times keep the site free from obstructions and rubbish and he shall remove from the site all surplus materials and temporary works as soon as these are no longer required on site. Facilities for disposal of rubbish shall be provided by the Contractor. On completion of the works, the Contractor shall remove all surplus materials, benches, racking, tools, cable drums, equipment and all rubbish and shall leave the site in a clean and tidy condition to the satisfaction of the Engineer.

For the purpose of this Clause, the definition of the word 'site' shall be extended to include all roadways, paths, passageways or any other means by which the Contractor or his workmen obtain access to or egress from the site.

6.16 Clear Access Routes

Corridors, roads and paths etc., shall be kept clear of all obstructions during such times as the work is not being carried out and no materials shall be deposited in those places.

The information contained on the Electrical Contractors working drawings shall be incorporated on the Record Drawings.

6.17 Safety, Health and Welfare at Work Act 2005

The attention of the Electrical Contractor is directed to the requirements of the Safety, Health and Welfare at Work Act 2005 and to the regulations made there under in relation to the work comprised herein.

7. WARRANTY / MAINTENANCE

The work is to be maintained in good running order for a period of twelve months after the completion of the Contract and after this period of twelve months, finally passed by the Engineers. Any defect developing in the system during this period to be rectified and made good at the Electrical Contractor's own expense. Causes outside the control of the Contractor are accepted.

In the event of the Contractor refusing to rectify defects within a reasonable period, the Engineer Specialist Manufacturers and Suppliers of the full shall have the power to have the work done by others and deduct the cost of such work from the Electrical Contractor's account, without prejudice to any other claim, which may arise out of the refusal of the Electrical Contractor to make good the defects.

8. TECHNICAL SPECIFICATIONS

The purpose of this section is to set out the specific criteria for the Electrical Services.

8.1 Energy requirements

Energy is a key consideration at every stage of the construction process. The Electrical Services Installation shall be in accordance with Building Regulations (Particularly Part L) with system installed efficiencies suited to achieve NZEB requirements.

8.2 Codes, Standards and Design Guidelines

- Building Regulations:
 - Technical Guidance Document B – Fire Safety;
 - Technical Guidance Document M – Access and Use;
 - Any other relevant technical guidance documentation.
- Other Regulations
 - All relevant Irish Standards and Regulations
 - All relevant European Standards and Regulations
 - Guidance documentation from CIBSE, IET etc.,
 - IS10101 National Rules for Electrical Installations,
 - IS3218 Fire Detection and Alarm Systems,
 - IS3217 Emergency Lighting
 - Any other relevant technical guidance documentation.

8.3 Preliminaries

Typical preliminaries services/preparation for the development of all elements.

8.4 Site Services (Element 60)

General

The tenderer shall include for the supply, installation, testing and commissioning of the complete external lighting installation, as indicated on the attached drawings.

Building mounted light fittings to be provided as indicated. The external lighting comprises of IP65 rated L.E.D. fittings.

Building Mounted Luminaries

The Electrical Contractor will carry out all electrical work, including supply cut-outs, photo electric cells and connection / termination. Luminaire shall include an integral PIR.

Wiring to External Luminaries

Wiring to building mounted lights shall be 4mm² singles in conduit for building mounted and 4mm² LSF/SWA cabling sign lighting with final connection in heat resistant flexible cable.

All external lighting to be interfaced with intruder alarm system. Upon activation of intruder alarm, a signal will override external lighting controls and activate operation of these lights.

All external lighting shall be as indicated in drawings.

8.5 Electrical Supply and Main Distribution (Element 61)

Scope of Works

A Periodic Inspection report to be carried out on all main boards and sub distribution boards in both buildings.

Labelling and Circuitry

The Electrical Contractor shall be responsible for labelling and circuitry charts for all items of switchgear. Warning labels shall be White on Red and designation labels shall be Black on White, and in accordance with the IS10101 regulations.

Set of as-built floor plan layout drawings showing the general arrangement of electrical power distribution system.

A "Circuit Schedule" in A4 format, should be posted at all sub-distribution boards. The minimum information that should be included in the schedule is, the "Source of Supply", "Circuit Number", "Phase", "Description", "Room Number", "Rating in Amps" as per sample. This information should be readily available to the Contractor, as it would normally be required for the construction of the system. Note that the "Source of Supply" and the "Circuit Number" also appear on all sockets, light switches, isolators etc., allowing the maintenance electrician to quickly and easily trace the source of supply in service.

Earthing and Bonding

General

The earthing and bonding of the installations shall be in accordance with the IS 10101 National Rules for Electrical Installations.

All sub-circuits shall be provided with independent earth protective conductors (CPC's) equivalent in size to live and neutral conductors.

All extraneous metalwork shall be equipotentiality bonded, including pipework and mechanical plant. Earth connections shall be a minimum of 2.5mm PVC if run in conduit, 4.0mm PVC if run exposed.

Armouring of sub-main cables shall be cross bonded in parallel with the separable CPC run with the cable in each case.

Bonding

Bonding of mechanical services pipework and ducting shall be affected at its point of origin in the building, i.e. plant room or entry point to the main earth terminal by means of a conductor and suitable means of connection.

Main mechanical services such as gas, water, ventilation, heating pipework shall be wired in 25mm² PVC earth cable.

All sinks, pipework, metal shelving, extraneous metal in kitchens shall be bonded in a minimum of 2.5mm² earth cable - all looped.

8.6 Power (Element 62)

General Power Installation

General

The tenderer shall supply, install, test and commission the small power installations in accordance with the specification and drawings and in accordance with listed standards and regulations.

The small power installations shall comprise the following:

- Radial final circuits supplying 20A, spur connection units and fixed equipment.

General Requirements

All outlets shall be fitted with labels indicating circuit No. way, etc.,

Outlets shall conform with European regulations and shall be CE marked.

Wall mounted outlets generally shall be 450mm from ground level, unless otherwise specified, and circuited in accordance with the drawings but in particular heights to be in compliance with Building Regulations TGD M.

Wiring shall be 4mm² LSF cabling in steel conduit from 20A MCB's type C, RCBOs as appropriate. The Contractor shall include for an earth loop from the earthing pin on the socket to the earth terminal on the outlet box.

All power outlets should have secure and long-lasting labels (to last the life of the unit), indicating their power source, phase etc., and be labelled correctly corresponding with the as-built drawings, circuit schedules etc.

Radial circuits supplying spurs shall be protected by 20-amp MCB's type C and wired in singles 4mm².

The Contractor shall include for earth loop from earthing terminal on socket to earth terminal on socket box. In the case of larger radial circuits to clean area equipment, etc. The following cable sizes shall be adhered to for MCB's of a rating shown.

MCB Rating	Cable Type / Size
30A	6.0mm ² LSF for phase and neutral
40A	10.0mm ² LSF for phase and neutral
63A	16.0mm ² LSF for phase and neutral

Corresponding circuit protective conductors C.P.C.'s shall be sized in accordance with IS 10101 National Rules for Electrical Installations 2020 with latest amendments

Mechanical Plant

General

The Contractor shall include in this section for the electrical installation associated with mechanical plant, under sink water heaters, electrical cistern electric heaters, etc.

Labelling & Tagging

Terminal identification markers, corresponding to the drawings, should be of white thermoplastic with markings in black. Markers should clip into moulded slots on each terminal.

All internal panel equipment should be clearly identified.

All internal panel wiring and field wiring should be tagged.

All cables connected to the panel should be clearly tagged as per drawings/cable schedule.

"As built" electrical schematic drawings should be provided at each panel, which should be accurate and correct, incorporating any changes that occur during installation. They should be enclosed in protective plastic envelopes fixed to the inside of the respective cubicle doors.

A schedule of all panel components showing make and model numbers should be provided.

Attendance on Commissioning

The Contractor shall include for attendance as required during commissioning of the mechanical plant and equipment.

The Contractor shall also include for attendance by the controls specialist during installation/commissioning and shall confirm all wiring requirement with specialist before installation.

Wet Areas

All power supplies serving wet areas (Lighting circuits and fan circuits) to be protected by RCBO's.

Small Power Circuits

Each small power circuit to serve only 1 No isolator.

8.7 Lighting (Element 63)

General

New lighting installations shall be provided throughout the Cashel Further Education and Training Centre as indicated on the drawings. The lighting installation shall comprise a combination of dimmable LED luminaires complete with absence and daylight sensors.

The existing emergency lighting system shall be retained and shall continue to serve the building.

Where modifications or additional emergency lighting are indicated on the drawings, they shall be supplied, installed, tested and commissioned by the Electrical Contractor and shall comply with I.S. 3217:2023 – Emergency Lighting.

General lighting shall be designed in accordance with IS EN 12464-1

The Contractor shall include in this section for the complete lighting installation as per attached lighting layout drawings indicate switching arrangements and the types of luminaires to be employed in respective areas. Luminaire references shall be read in conjunction with the symbol legend.

General Lighting

Lighting shall be wired utilising 2.5mm² LSF cabling in concealed galvanised steel conduit and trunking, unless otherwise stated. The circuits shall be protected by 10 Amp RCBO.

The lighting will comprise generally of Accent LED Lighting, Display LED Lighting, Linear Surface L.E.D. fittings in all cases, except for small areas. In these areas ceiling mounted L.E.D. bulkheads will be utilized.

Luminaires in general shall be mechanically connected to a metal conduit box with suitable brass R.H. screws (4mm minimum) finished to match metalwork of luminaires.

In the case of linear LED luminaires (greater than 600mm in length), these shall be secured by two such conduit boxes at the appropriate fixing centres.

Luminaires shall be wired directly with final connection using heat resistant cable.

Lighting Switches

The light switches shall be metal finish as manufactured by MK, Albany range with steel back boxes for Albany accessories or equivalent.

Switches shall be mounted at a height of 1100mm over finished floor level to centre line except where otherwise specified.

Multiple switch boxes and plates shall be provided at all points where switches are to be grouped.

Lighting Circuits

No lighting circuits shall exceed 1 kW in loading or feed in excess of 8 No. fittings.

Lamps

All light fittings shall be complete with LED lamps.

Switching

Manual on/off, two-way switching

Push Button Light Switches with PIR/Absence detectors.

Lighting Automatic Controls will be utilised on some of the exterior light fittings, signage lighting which will be via a digital timeclock, contactor and photocells. The building mounted lighting to be linked to the intruder alarm system and will operate on activation of the intruder alarm system.

Emergency Lighting

General

An emergency lighting installation is to be provided throughout in accordance with IS3217:2023 V004 Emergency Lighting

The emergency lighting installation shall comprise surface mounted, self-contained, battery-operated light fittings and LED luminaires fitted with inverter pack for operation under local mains failure.

All emergency light fittings to be provided free issue to the electrical contractor.

Each unit shall be connected to the unswitched active side of the local lighting circuit nominated.

LED luminaires designed to operate under emergency conditions shall have dual inverter and battery pack located within the body of the luminaire. The tenderer shall include for supply and fixing a "red" diamond shape identification tag which shall be fixed adjacent to the emergency luminaire.

Due allowance shall be made for luminaires being adapted by the luminaire manufacturer or emergency lighting equipment supplier.

Central Test Unit

A multi zone Central Unit shall be located adjacent to the sub distribution board.

The central test unit shall have the following facilities: -

- 1) Lock off switch, to prevent unauthorised use.
- 2) Mains on indicator.
- 3) Accurate crystal-controlled timer.
- 4) Test periods of 1 hour / 3 hours.
- 5) Test in progress indication.
- 6) Test completed indication.
- 7) Audible indication on test completion.
- 8) Automatic reset after test.
- 9) Comply with provisions of IS 3217

The central test unit shall come complete with a 6-pole interface unit which shall have a 230V relay coil.

The central test unit, located adjacent to the distribution board, shall have relays incorporated into the distribution boards as an integral part.

Self-contained emergency light fittings shall be supplied from the same RCBO as a local lighting circuit which shall then feed through one pole.

8.8 Security and Protection (Element 65)

Fire Detection and Alarm System

The existing fire detection and alarm system at the Cashel Further Education and Training Centre shall be retained and shall continue to serve the building.

New fire detection devices shall be provided only where indicated on the drawings. All new fire alarm devices shall be compatible with the existing fire alarm system.

Any new fire alarm wiring shall be installed within dedicated containment using fire-rated cabling and shall be designed, installed, tested and commissioned in accordance with I.S. 3218 – Fire Detection and Alarm Systems for Buildings, HSA legislation, the Building Regulations, and all relevant Government Circulars and Publications.

Ducts and Seals

Seals will be provided in all trunkings, trays, etc. where these services pass through fire rated partitions, etc.

Mechanical Wiring

All power and control wiring associated with all mechanical plant is to be carried out by the Electrical Contractor, incorporating all power supplies to heat pumps, fans, pumps etc.,

Fire Alarm Detection and Alarms

General

The fire detection and alarm system will be to an L2/L3 standard as dictated by the fire certificate application, will be provided, and will be designed in accordance with IS3218:2024 (V004) 'Fire Detection and Alarm Systems for Buildings', HAS Legislation, Building Regulations TGD Document B and all Government Circulars and Publications.

Wiring

The complete fire alarm system shall be carried out in Firetuf cable with Fire Rated sheath. Fire Rated sheath shall be red in colour, and installed in a dedicated containment system

(Galvanised steel tray and drops in galvanised steel conduit.) Metal fire rated clip will be used when clipping to the tray.

Final connection to alarms, door holders and call points shall be in conduit to accessories.

Control Panel

The 1 loop control panel incorporates its own 24-volt power supply and stand by batteries. This panel is located at the exit from the stair core. The control panel will monitor the status of all detection and alarm devices.

The detection devices, which can be a combination of optical smoke detectors, heat detectors and break glass units and sounders.

The panel will be capable of interfacing with Fire Smoke Damper Panel, Passenger Lift, Door Access Control System, Lifts Air Sampling Detection System, Smoke Vent Control Panels, Solenoid Valves.

Detection

Each individual detector is scanned and its status is stored in the Control Panel once every 2 seconds. If a detector moves towards an alarm condition on a very slow basis, as in the case of dirt build up in a smoke detector, a pre fire warning will be activated and the dirty detector will be identified as described above, alarms, etc will not be activated.

If the detector output reaches a pre-determined level the control panel will automatically initiate an alarm condition.

The sensitivity of smoke detectors may be adjusted manually from the Control Panel to low, normal or high and will be adjusted automatically to suit ambient conditions, therefore a detector operating within a clean environment will require a lower signal to initiate an alarm than will a detector in a dusty atmosphere.

The above-mentioned sensitivity adjustments and pre-alarm conditions are designed to eliminate the problems of false alarms.

Detectors

Detectors shall be a mixture of smoke and heat detectors, as shown on the drawings. Both optical and ionisation smoke detectors shall be used.

- Optical smoke detectors: low profile with LED;
- Ionisation smoke detectors: low profile with LED;
- Heat detectors: low profile with LED.

The above detectors shall come complete with analogue sensor base with identification label.

Alarms

The alarms within the complex will be connected on two independent loop circuits to the fire control panels. The alarm sounders will be suitable for two stage alarm with an evacuate signal in the detection / alarm zone of the fire origin and an alert signal in horizontally adjoining alarm zones and those directly above and below the zone of fire origin. The alarm tone will be generated at the control panel and may therefore be altered or changed on site in order to ensure that the fire tone is distinctive from all other alarms.

Sounders

The sounders shall be multi-tone electronic sounders ROSHNI type operating at a recommended frequency of 800/970Hz. They shall have an output to achieve the required 65dB settings and will have visual indications of alarm.

External sounder shall be IP 65 rated.

Addressable Sounders

Sounders shall be fully addressable and suitable for operating directly from the detection loop. Any remote area of lower alarm sound level of less than 65 dBa shall be fitted with an addressable sounder. Attention shall be paid to the number of sounders operating on the loop.

Audio Visual Units

It shall be weather resistant to IP65 and coloured Red.

Ancillary Services

The following ancillary services are to be actuated by the fire detection and alarm systems:

Automatic door releases both within and forming the boundary of the alarm zones where evacuate and alert signals are sounded. (Manual facility to release all electromagnetic catches to be provided at control panels);

All access control system exits from the alarm zone where an evacuate signal is sounded to be released automatically;

While it is not normally recommended that the mechanical ventilation / air conditioning systems be automatically stopped by the fire detection and alarm systems, provision is to be made at the control panels to manually shut down any such systems;

Any lifts discharging into the alarm zone in which an alert or evacuate signal is given are to be returned to the level of the final exit from the building and disabled;

Any smoke activated dampers in the boundaries of the alarm zone in which an evacuate signal is sounded are to be released.

Communications with the Fire Brigade

A link with the fire brigade is to be established via a remote monitoring centre designed and operated in accordance with IS 3218

Cable and Wiring

Fire alarm cable shall be fire rated in accordance with IS3218 and Pirelli/Firetuf with red outer sheeting. It shall have a minimum cross-sectional area of 1.5mm and greater if required. All inter-panel wiring shall be twisted pairs, fire-rated and mechanical protected. Suitable conduit boxes shall be used at each device.

Isolator Modules

Isolator modules shall be suitable for ceiling or wall mounting and shall be fitted approximately every 25 devices as to comply with IS. 3218. Its operation shall be totally automatic and shall not be necessary to replace or reset after its normal operation.

Addressable Relays

Addressable relays will be provided to all interfacing equipment, namely access control.

Cable Fixing

Fire Alarm cable shall be rigidly supported at all locations by means of proprietary fire rated clips. Clips shall be fixed to the cable tray at not greater than 600mm centres.

Power Supply Unit

The power supply unit to provide 24 V power to the electromagnetic door hold-open devices, access control and smoke vents shall incorporate an addressable relay, 230V transformer and 230 V relay. The Contractor shall include for providing a 230 V supply to the power supply units

Interconnecting Cable

The cable interconnecting the fire alarm panel and repeater panels shall be 4c fire rated FP400 twisted pair type cable.

The Contractor shall also include for interconnecting cable between fire alarm panel, MCC 1, Fire Smoke Panel, Smoke Vent Panel etc.

Zone Indication Map

The Contractor shall provide a zone indication map of the building adjacent to the main panel in a hardwood frame.

Drawings Approvals and Supervision

The Contractor shall include for the provision by the fire alarm supplier of full "working" drawings and specification for approval by the Employers Representative. The Contractor shall also include for site supervision by the duration of the installation process.

Final Testing & Commissioning

The Contractor shall include for final testing and commissioning of the entire system by the specialist contractor who shall be responsible for presenting a Commissioning Certificate acceptable to the Clients' Insurers, The Employers Representative and the Local Authority.

Smoke Vents

The Contractor shall include for interfacing the fire alarm system to installed smoke vents to enable their operation under the Fire alarm strategy.

8.09 Other Services (Element 68)

Bonding of all extraneous metal conductors will be required particularly where the new electric under sink heaters and hot water cylinder are being provided, the contractor is to ensure that bonding is provided to the water services pipework in the vicinity of the works.

Ducts and Seals

General

All electrical ducts entering buildings or passing through walls or floors shall be sealed by means of water, gas and fire-retardant seals. Such seals shall be readily removable, re-usable and capable of installation around trunking, conduit or cables. Split blocks of intumescent, compressible material shall be installed around each cable or to fill unused apertures. These shall be mechanically clamped into position.

The Contractor shall ensure that the duct end to which these seals are fitted are fully and adequately supported by the surrounding structure to resist seal pressure. Seals shall be installed in full accordance with the manufacturer's instructions and recommendations.

All cable trunking and tray penetrations shall be fire stopped internally and externally when passing through a fire wall, floor or ceilings.

All cable trunking shall be fitted with an internal fire barrier whenever passing through any wall, floor or ceiling to provide soundproofing and a fire barrier between adjacent areas.

Triple E Register

General

All electrical products utilised on this project to be Equivalent to the performance requirements and where practicable be on the SEAI Triple E Register.

Works in Existing Building

General

This section includes for the strip-out of the electrical installation required to facilitate the new works: -

Existing electrical services, being stripped out, are to be made safe and removed from site at the contractor's expense.

The scope of the works includes but is not limited to the following: -

Strip out and remove redundant light fittings and wiring.

Strip out and remove redundant emergency lights and associated cabling.

Strip out and remove redundant electric storage heaters and associated cabling.

Strip out and remove redundant power supplies to electric water heaters and associated cabling.

The general and emergency lighting system strip out is to be co-ordinated with the building maintenance staff to ensure proper protection and management of the strip out to prevent faults on the building system.

The contract shall include for all strip out works necessary for the completion of the works. Building finishes affected by any strip out works to be made good upon completion, to the satisfaction of the Building Maintenance.

All electrical trunking or ductwork passing through fire rated walls or floors shall be sealed by means of fire-retardant seals. Such seals shall be readily removable, re-usable and capable of installation around the services installed. Split blocks of intumescent, compressible material shall be installed around each opening to fill the apertures. These shall be mechanically clamped into position.

All cable trunking and tray penetrations shall be fire stopped internally and externally when passing through a fire wall, floor or ceilings.

All cable trunking shall be fitted with an internal fire barrier whenever passing through any wall, floor or ceiling to provide soundproofing and a fire barrier between adjacent areas.

All riser cupboard's locations with cable trunking and tray penetrations shall be fire stopped internally when passing through a fire wall, floor or ceiling.

Fire Alarm

The Electrical Contractor shall include for modifications to the existing fire alarm system as necessary to maintain an active fire alarm detection system in the construction site for the duration of the works. As a minimum, the existing detector points will be retained and replaced with heat detectors and capped during each day.

Note: Fire alarm services shall be maintained for the duration of the works.

Survey and Programme

General

The Contractor shall include for a detailed site survey of installation prior to works commencing.

Any items discovered which are at variance with TEM specifications and drawings are to be advised in writing prior to upgrade works. A detailed programme of works shall be submitted for approval to Engineer for agreement with the Client.

Operation and Maintenance Manuals

General

The Contractor shall supply two copies of a comprehensive Maintenance Manual, bound in a heavy transparent plastic cover containing the following:

- (a) Description of complete installation
- (b) Operating instructions on all specialist equipment and systems.
- (c) Details of emergency action to be taken in the event of breakdown.
- (d) List of recommended spares.
- (e) Adjustments, fault finding details.
- (f) CD-ROM containing digital copies of "as installed" drawings and 2 No. sets of "as installed" drawings coloured to assist interpretation.
- (g) Other relevant information.

Refer to TEM standard document for details on format and content required.

9 SPECIFICATION SCHEDULES

9.1 Electrical Drawing Schedule

<u>DRAWING NO.</u>	<u>DRAWING TITLE</u>	<u>SIZE</u>	<u>SCALE</u>
18572-1-301	General & Emergency Lighting – Ground Floor	A1	1:50
18572-1-302	General & Emergency Lighting – First Floor	A1	1:50
18572-1-305	Small Power and Ancillary Services Layout - GF	A1	1:50
18572-1-306	Small Power and Ancillary Services Layout - FF	A1	1:50

5.3 Schedule of Manufacturers and Suppliers

ITEM	MANUFACTURER/ SUPPLIER NAME	COST ADJUSTMENT	DELIVERY PERIOD
		EUR	

We confirm that the above alternative proposals do not form part of our lump sum tender amount, which is based on the specified plant and equipment. We further confirm that the proposals meet the specified standards in all respects, including space requirements, noise and pollution criteria, and include all costs associated with the change, e.g. labour, profit and overheads, and excludes Value Added Tax.

We understand that the Employer is not obliged to consider any of these alternatives. However, if considered, they may be taken up on total or in part and set against our lump sum tender bid.

Signed: _____

For and on Behalf of: _____

Date: _____

10 Electrical TENDER SUMMARY AND BREAKDOWN

10.1 Tender Breakdown (Element 69)

Item	Description	Price
.1	Preliminaries	€
.2	Electrical Supply and Main Distribution (Element 61)	€
.3	Power (Element 62)	€
.4	Lighting (Element 63)	€
.5	Security and Protection (Element 65)	€
.6	Other Services (Element 68)	€
.7	Any Items Not Included Above.	€
	TOTAL	€

10.2 Tender Breakdown – Site Services (Element 60)

Item	Description	Price
.1	Preliminaries	€
.2	Site Services (Element 60)	€
.3	Any Items Not Included Above.	€
	TOTAL - To be carried forward to the BOQ	€