

GRETB OFFICES, AN COILEAR BAN, ATHENRY, **CO GALWAY, PROVISION OF A STANBY** **GENERATOR FACILITY.**



An tSeirbhís Oideachais Leanúnaigh agus Scileanna
Further Education and Training Authority

VOLUME A.2.3.2.1 - ELECTRICAL SERVICES **SPECIFICATION, INCLUDING THE** **ASSOCIATED BUILDERS ATTENDANCES**

Document Control Sheet

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SPECIFICATION LAYOUT

VOLUME A: (the Works Requirements)

Volume A.2.3.2.1 Electrical Services Specification

Volume A.3.3.2 Electrical Services Drawings and Details

GRETb OFFICES, AN COILEAR BAN, ATHENRY, **CO GALWAY, PROVISION OF A STANBY** **GENERATOR FACILITY.**



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VOLUME A.2.3.2.1 - ELECTRICAL SERVICES **GENERAL ITEMS**

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VOLUME A.3.3.2 - ELECTRICAL SERVICES DRAWINGS AND DETAILS

The Electrical Services Drawings and Details are as listed in Clause 7 - "Tender and Contract Drawings".

VOLUME A.2.3.2.1 - ELECTRICAL SERVICES GENERAL ITEMS

1. DEFINITIONS

In construing the General Conditions and the Specification and Contract Agreement, the following words shall have the meanings herein assigned to them, except where the subject or context otherwise requires.

"The Employer"	Galway Roscommon Education Training Board, An Coilear Ban, Athenry, Co Galway. Tel: +353 91-549449 Email: info@gretb.ie
"The Mechanical/ Electrical Engineers"	Messrs Heavey Kenny Associates, 6 Liosban Business Park, 23E First Floor, Tuam Road, Galway Tel: 091-566004 / 091-565184 Email: admin@heaveykennyassociates.ie
"Project Supervisor Design Process (PSDP)"	Messrs Heavey Kenny Associates, 6 Liosban Business Park, 23E First Floor, Tuam Road, Galway Tel: 091-566004 / 091-565184 Email: admin@heaveykennyassociates.ie

2. FORM OF CONTRACT

The Form of Contract applying to this contract are those set out in the "Short Public Works Contract, Doc PW-CF6 V1.15", as published by the Department of Department Expenditure and Reform on the 25th November 2025.

Payment to the Contractor shall be made by the Client on the Certificate of the Employer's Representative (Engineers), in accordance with Clause 4 of the attached "Short Public Works Contract".

A Copy of the "Short Public Works Contract" including the Schedule attached to the Contract, is included with the Tender Documentation issued to the Contractor.

3. CONTRACTOR TO INFORM HIMSELF FULLY OF SITE CONDITIONS

The Contractor shall be deemed to have made a thorough examination of the Contract Documents, the site and all features thereof, the existing premises, together with all internal and external services, adjoining premises and property or other things affecting the proposed works, to ascertain precisely the nature and extent of same and the condition under which the works will have to be executed, as no claim will be allowed on the grounds of want of knowledge in this respect. The Contractor shall generally obtain his own information on all matters and things which can in any way influence his tender.

Unless he does so at this time, it is probable that extra work arising from any deviation from the contract for any reason other than the most exceptional circumstances, shall not be compensated by the Client.

Access to the site for inspection purposes can be made by prior arrangement with the following:

<u>Contact Person</u>	<u>Capacity</u>	<u>Telephone No.</u>
Mr Liam Howley	Buildings Department, GRETB, An Coilear Ban, Athenry, Co Galway	091-874550 liam.howley@gretb.ie

4. DESCRIPTION OF SITE AND BUILDING

The Galway Roscommon Education and Training Board (GRETb) Offices are located at an Coilear Ban, Station Road, Athenry, Co Galway, in a standalone 2 storey building which is on a shared complex with the GRETB Further Education and Training facilities as indicated on the attached site plan.

The works that require to be carried out at the GRETB Complex comprise of the provision of a new standby generator facility, including the alterations and additions to the existing Main Electrical Distribution centre in the entrance lobby to the main office building, and the provision of a new external electrical distribution cabinet, including the associated distribution cables, including the associated Mechanical Services and Builders Attendances, etc.

5. SCOPE OF ELECTRICAL AND MECHAICAL SERVICES

The Entire works on this project shall be carried out by a **Competent Safe Electric / RECI Registered Electrical Contractor/ Main Contractor**, which shall comply fully with the rules of the NSAI National Rules for Electrical Installations I.S. 10101: 2020 +AC2: 2025), including the IET Wiring Regulations, 18th Edition, and BS 7671:2018 +A4: 2026.

The Electrical and Mechanical Services and all associated builder's attendances for this project are divided into sections as follows: -

Element (61): Electricity Centre and Main Distribution

Element (68): Earthing

Element (50): Site Mechanical Services

Associated Builder's Attendances

Element (61): This section covers the provision of the alterations and additions to the existing Main Electrical Distribution centre in the entrance lobby to the main office building, including the provision of a new external electrical distribution cabinet, including the associated distribution cables, additional LV and ELV cable tray and all associated equipment as indicated on the drawings and as specified below.

This section shall also include for the supply, delivery to site, installation, testing and commissioning/ certification of a new standby Generator Set, with each set consisting of diesel engine, electronic governor, sound attenuated weatherproof canopy, battery and engine mounted battery charging alternator, built-in 8 hour fuel storage tank in the base of the unit, generator control panel, etc., which shall be carried out as a specialist supplier to the Electrical Contractor, as indicated on the drawings and as specified below.

This section shall include for the diversion of the existing incoming 3-Phase Electrical supply to the main office building to the new external electrical distribution cabinet by ESB Networks, and all associated ESB Networks Capital Contribution Charges shall be paid directly by the Client.

Element (68): This section covers the provision of the earthing installation which shall comply with the requirements of the National Rules for Electrical Installations I.S. 10101: 2020 +AC2: 2025), including the IET Wiring Regulations, 18th Edition, and BS 7671:2018 +A4: 2026.

Element (50): This section includes for the provision of an oil storage facility for the standby generator set, consisting of the supply and installation of a new 1300 Litre Double Skin Medium-density Polyethylene (MDPE) self-bunded oil storage tank, including the provision of a continuous 20 mm internal diameter PVC coated copper tubing oil line between the new oil storage tank and the standby generator set, as indicated on the drawing and as specified below.

Associated Builder's Attendances: This section includes for the provision of builders attendances associated with the provision of a standby generator facility, consisting of the construction of the new generator compound, including the provision of the supports of the new oil storage tank, including the provision of the PVC ducting and trenching for the electrical cables and the new oil line and all associated re-instatement works, as indicated on the drawing and as specified below.

6. REMOVAL OF EXISTING SERVICES

The Contractor shall include in his tender for the stripping out, removal and proper disposal of all of the existing Electrical Services Installation, which become redundant by virtue of the Contract Works.

When stripping out the redundant services the Contractor shall ensure that no unnecessary damage is caused to either the equipment and/or the building fabric which is to be retained.

The Contractor shall be responsible for removing all redundant materials from site and the disposal thereof in accordance with environmental guidelines, e.g. hazardous substances, recycling of metal, WEE Directive, etc.

7. TENDER AND CONTRACT DRAWINGS

Copies of drawings of the building are issued with each Specification. Dimensions and other information shown on the drawings forming part of the Contract are believed to be correct, but no responsibility for same is accepted. The Contractor shall be solely responsible for the setting out of the work, and he shall rectify any errors he may make, either in setting out the work or during its progress.

The Contractor shall not deviate in the execution of the work from the Specification or Drawings herein referred to, except upon written order signed by the Employers Representative authorising such deviation. Should any work or articles obviously intended by the drawings and necessary to complete the works have been omitted to be defined as specified in the Specification or the Schedule of Prices, same is to be performed or supplied to the directions of the Employers Representative without any additional payment.

The following are the drawing numbers which indicate the details of the layouts:

<u>Drawing No.</u>	<u>Title</u>	<u>Scale</u>
6941/E60/01	Layout of Electrical Services-Site and Details	As Shown
6941/E61/01	Schematic Layout of the Electrical Distribution System	As Shown
6941/M50/01	Layout of Mechanical Services-Site and Details	As Shown
6941/BLD/01	Layout of Associated Builders Attendances and Details	As Shown

A copy of each of the above drawings is issued with this Specification and shall be signed and returned by the Contractor when submitting his tender.

8. TENDERS

The Contractor shall submit his tender for a gross specific amount in Euros, which shall include all materials, workmanship, plant, carriage and cartage and expense incidental to the due performance of the several works as set forth in the Specification and as shown on the drawings to their true intent and meaning.

Any item left unpriced in the Pricing Document (Volume C) shall be deemed to be included for in the tender and the cost of the item shall be deemed to be spread across and included in the rates generally.

9. INSURANCE

The Contractor shall make full provision in his tender for complying with the requirements of Clause 10 of the attached “Short Public Works Contract” in relation to Insurance and Compensation. He shall affect adequate insurance in his own name and also in the name of the Employer to cover all the risks or claims specified in the aforesaid “Short Public Works Contract” and shall hold the Employer indemnified against all such claims and risk in anyway arising out of the works included in the Contract. The Contractor shall fully comply with the Social Welfare Acts, the Conditions of Employment Acts and other Statutory Orders effecting the Employer and Employed.

The minimum sum for public liability insurance shall be €6,500,000.00 (six million, five hundred thousand euro) for any single claim, including employer’s liability of €13,000,000.00 (thirteen million euro) and separate all risks insurance as stated in the attached “Tender and Schedule”.

The contractor should note the following specific requirements in relation to the insurances on this project as follows:

The Contractor's Public insurance must be extended to note GRETB as an Additional Insured and a Non-Vitiation clause applied, similar notations are required under the Contractor's Products Liability and Contract Works Insurances.

The Contractor shall arrange with their insurers to provide evidence of their insurances confirming the extension *noting GRETB as an Additional Insured and a Non-Vitiation clause applying.*

10. TIME FOR COMPLETION

The Contractor shall complete the work in strict accordance with the drawings and specification and to the satisfaction of the Employers Representative within the period indicated in Clause 1.1 of the schedule attached with the "Short Public Works Contract".

It is intended that the works will be carried out and fully completed and certified during the period from the 14th September to the 30th October 2026, and the Contractor shall have partial procession of the building during this period in order to facilitate staff members in a section of the building in agreement with the Client.

11. PAYMENT

Payments to the Contractor shall be from the Client to the amounts as certified by the Employers Representative, at the rate of 90% of the value of the works completed, and materials delivered to the site with title vested in the Employer, to the Employers satisfaction as per Clause 4.1 and 4.2 of the schedule attached with the "Short Public Works Contract". Half the retention money shall be released upon 'Substantial Completion' and hand-over in accordance with the programme. The balance of the retention money shall be released 12 months after completion of all of the works, and only then if the contract terms of maintenance have been properly carried out. The Contractor shall ensure that all claims, along with all the necessary supporting paperwork, are submitted to the Employers Representative for clearance at least two weeks prior to the date on which the Certificate shall be issued.

12. DEFECTS LIABILITY PERIOD

During the defect's liability period, the Contractor shall be responsible for the proper performance of the installations provided.

All items of plant, equipment, apparatus or materials supplied under this Contract, whether of the Contractor's own make or supplied by a Supplier, shall be guaranteed against faulty workmanship or materials during the defect's liability period.

The defects liability period shall be 12 months from the date of the Employers Representatives date for certificate of substantial completion, which shall be in accordance with the requirements of Clause 30 below.

If any equipment or part thereof during that time be found defective or show signs of weakness due to its selection, manufacture, installation, commissioning, faulty design of materials or workmanship or to neglect on the part of the Contractor, or which in the opinion of the Employers Representatives is unsatisfactory, the Contractor shall at his own expense, repair or remove such equipment, articles or things and substitute others for them, and if the Employers Representatives think fit to make such repairs or removal, the Contractor shall bear the cost thereof.

In any event that any plant or equipment is shown to be defective due to manufacturing, installation or commissioning during the defect's liability period, the Contractor shall at his own cost obtain an extension to any applicable manufacturer's warranty in order to cover the full original warranty period for the item, starting at the date of the resolution of the fault or replacement of the faulty equipment.

In the event that the Contractor is unable to achieve an extended manufacturer's warranty, then the Contractor shall remain liable for the replacement of the item of plant or equipment if it fails during the extended warranty period.

The cost of making good any defects which may arise from fair wear and tear or from want of proper care or maintenance by the Employer in the running of the plant shall be excluded from this defect's liability period.

13. SAMPLES / MATERIALS AND PRODUCTS

Samples of all materials, manufactured articles or other goods shall, if required, be submitted to the Employer's Representative for provisional approval before adoption. Such approval shall not relieve the Contractor from responsibility for making good any defects which may arise as a consequence of failure or otherwise of any materials during the contract period.

The entire installation shall be constructed from new materials and equipment, and all materials and workmanship shall be the best of their respective kinds in accordance with the specification.

All materials and equipment selected or proposed by the Contractor shall be provided by manufacturers who have local maintenance and servicing capacity available within the Republic of Ireland as necessary.

All samples for approval shall be provided for appraisal in a timely manner and where samples are not available the Contractor shall submit other details for approval such as other reference sites, drawings or photographs as necessary.

14. HOT WORK

The Contractor shall provide for the following safety measures during any hot work processes carried out on site:

1. Suitable fire extinguisher apparatus available at site of hot work.
2. Checking and removing ignitable substances from vicinity of hot work while in progress.
3. Ensuring that all necessary fire precautions and supervision are implemented.

It shall be the Contractors sole responsibility to ensure that these measures are implemented.

15. BUILDERS ATTENDANCES/ BUILDERS WORK DRAWINGS

All Builder's Attendances associated with this contract **shall be marked out and carried out by the Contractor**. This shall include the provision of the construction of the new generator compound and the new oil storage tanks supports, the provision of the new external PVC pipework in the trenches, including making good, etc. as indicated on the attached drawings and as outlined in the attached schedule of prices.

The Contractor shall be responsible for the correct setting out and marking out of all such builder's attendances and for superintending and directing employees detailed to execute such work. All builder's attendances shall be as set out in the attached schedule of Builder's Attendances.

The Contractor shall be responsible for the fixing of all brackets, supports, clips etc., required to carry out the electrical and mechanical services installation in accordance with the specification and drawings and agree with the Employer's Representative the method of fixing before such works commence on site.

16. SUPERVISION

The Contractor shall make available throughout the duration of the works a Project Supervisor or Site Foreman with appropriate qualifications and or experience to attend site meetings and receive instructions as are necessary for the execution of the contract, and to carry out superintendence of the works on site.

The Project Supervisor /Site Foreman shall keep accurate records and details of all aspects of the works as necessary.

17. INSPECTION BEFORE CONCEALMENT

Whenever work requiring inspection or testing is subsequently to be concealed, due notice shall be given to the Employer's Representative so that inspection may be made or tests witnessed before concealment.

Failure to give due notice, of at least 48 hours, shall necessitate the Contractor uncovering the work and reinstating it at their own expense.

The Employer's Representative reserves the right to forego its inspection; however, this will in no way relieve the Contractor's responsibility to comply with the specification and drawings.

All work that is not installed to the required standard or does not demonstrate adequate co-ordination with the building and other services must be removed and re-installed in full compliance with the tender documentation and relevant standards at the Contractor's cost and without any associated increase in the project program.

18. TESTS ON COMPLETION

When the work has been completed the Contractor must carry out such tests and provide such apparatus, instruments and materials, as the Employer's Representative may consider necessary.

The Contractor shall give to the Employer's Representative in writing, 21 days' notice of the date after which he will be ready to make the tests on completion. Unless otherwise agreed, the tests shall take place within ten days after the said date, on such day or days as the Employer's Representative shall be writing to notify the Contractor. Electricity, as required shall be paid for by the Employer.

If the Employer's Representative fails to appoint a time after having been asked to do so, or to attend at any time or place duly appointed for making the said tests, the Contractor shall proceed to carry out the tests himself and shall report the results to the Employer's Representative and the tests shall be deemed to have been made in the presence of the Employer's Representative.

If, in the opinion of the Employer's Representative, the tests are being unduly delayed, he may by notice in writing call upon the Contractor to make such tests within ten days from the receipt of the said notice and the Contractor shall make the said tests on such day within the said ten days as the Contractor may fix and of which he shall give notice to the Employer's Representative.

If the Contractor fails to make such tests within the time aforesaid the Employer's Representative may himself proceed to make the tests. All tests so made by the Employer's Representative shall be at the risk and expense of the Contractor, unless the Contractor shall establish that the tests were not being unduly delayed in which case tests so made shall be at the risk and expense of the Employer's Representative.

19. MAKING GOOD DAMAGE

The Contractor shall inspect all equipment and materials on arrival on site for defects or any failure to meet the specification and shall replace any defective equipment or materials as necessary.

The Contractor shall take all necessary precautions to ensure that there is no damage or defacements caused by their employees or representatives to the furniture, fittings or other equipment within the buildings or to the premises themselves or to adjoining premises and shall make good at their own expense any damage caused to the premises or its contents during the works, to the entire satisfaction of the Employer's Representative.

The Contractor shall remove all rubbish, plant and unused materials from the site on completion of the works and provide for their proper disposal in accordance with the Local Authorities guidelines / requirements, including the WEE Directive.

At substantial completion the Contractor shall present all plant and equipment to the Employer's Representative in a fully working and un-damaged condition. Any damaged plant or equipment must be replaced prior to substantial completion. Failure to deliver un-damaged plant and equipment at substantial completion may lead to their exclusion from the substantial completion certificate and the delay of the commencement of the defect's liability period and warranties for the equipment in question.

20. ELECTRICAL SUPPLY AND CONNECTION TO EQUIPMENT

The electric wiring of all equipment supplied under this contract shall be carried out under this contract by a **competent Safe Electric /RECI -registered electrical contractor**. The Contractor shall include for assisting the Electrical Contractor in the correct setting of all supplied plant and control equipment, etc., and shall be solely responsible for ensuring that they are operating satisfactorily. He shall also include for handing over to the Electrical Contractor, all information regarding electrical equipment being supplied by him.

This information shall be handed over as soon as possible after the contract is placed, and certainly not later than two weeks after signing of sub-contract.

The electrical supply available is normal ESB's Three phase supply, 380 volt, 50 cycles and all electrical equipment supplied under this contract, shall be suitable for the above-mentioned electrical supply.

21. ELECTRICAL SUB-SYSTEMS CERTIFICATION

The Electricity Regulation Act 1999, as amended, makes it mandatory for a [Registered Electrical Contractor \(REC\)](#) to issue a Completion Certificate for all restricted and controlled [electrical works](#).

It is through this certification system that Safe Electric, can monitor and validate that the electrical works completed meet the required safety standards of the National Rules for Electrical Installations, and the Electrical Contractor is required to issue an Electrical Completion certificate for all restricted and controlled electrical works undertaken by them, which would be supplemental to other certification such as IS 3217: 2023 (4-part) or IS 3218: 2024 (6-part) certificates for emergency lighting and fire alarm installations.

To facilitate the wide range of electrical works undertaken by RECs, the different types of Completion Certificates are outlined below:

Certificate No. 1 (paper based) (<50 kVA): Completion Certificate for the connection of new electrical installations (less than 50kVA) to the Distribution System Operator (DSO) Network. A sample for an Electronic Certificate No. 1 is available [here](#).

Certificate No. 2 (paper based) (≥50 kVA): Completion Certificate for the connection of new electrical installations (greater than or equal to 50kVA) to the DSO Network. A sample for an Electronic Certificate No. 2 is available [here](#).

Certificate No. 3: Covers alterations (including additions and extensions) to existing installations, additions, extensions, subcontract, agricultural and government grants (non-DSO). Certificate No. 3 cannot be used to obtain a connection or a re-connection of the electrical supply from the DSO.

Interim electrical installations (≥50kVA): Interim Certificates are validated by Safe Electric to enable the main distribution board in an industrial or commercial installation to be energised so that a completed subsystem e.g. a lift system, or a standalone module, can be tested or commissioned.

The Contractor and his Electrical Contractor shall issue an appropriate electrical completion certificate along with the test results associated with same, which shall be included in the Project Safety File.

22. WORKING HOURS/ INTERRUPTION OF SUPPLIES

Whilst there are no particular strict limitations placed by the Employer on working hours on the project Works, the Contractor is to take into consideration that due to the nature of the project it will be necessary to maintain the mechanical and electrical services installations in operation at all times, as the works will be carried out when the GRETB offices are occupied by staff and other groups.

All works involving significant noise must be carried out outside of the GRETB normal office hours in agreement with the Client. It may be necessary also to carry out some of the works after normal hours and the Contractor shall factor all of these costs in their tender submission.

23. SAFETY, HEALTH, WELFARE AND ENVIRONMENTAL ISSUES

Safety, Health, Welfare and Environmental Issues

Comply fully with all statutory safety, health and welfare regulations regarding work people, including those employed by Sub-contractors employed on the site and particularly the Safety, Health & Welfare at Work (Construction) (Amendment) Regulations SI No 528 of 2021 and carry out the function of Project Supervisor for the Construction Stage of the Project.

The contractor shall comply in all respects with the Factories and Safety in Industry Acts and any other Acts and with any Statutory Instruments or Regulations issued thereunder.

The Contractor is required to provide a safety method statement clearly indicating the precautions he will be taking at each stage in the works to protect his employees, sub-contractors, visitors and the Employers personnel and any plant and equipment, etc. Full details of any chemical or substances proposed to be used in the project construction process should also be detailed fully and the Employer's prior written approval received for its use.

Safety, Health, Welfare at work Acts and Regulations Compliance

The contractor shall be appointed by the client under a collateral agreement to the main contract as Project Supervisor for the Construction Stage in respect of the project pursuant to the Safety, Health & Welfare at Work (Construction) (Amendment) Regulations SI No 528 of 2021. The contractor shall include all costs for the provision of the services of Project Supervisor for the Construction stage pursuant to Regulations 16 to 22 inclusive of these Regulations.

The Contractor shall include for providing all necessary information as requested by the Project Supervisor for the Design Process, to enable the completed Safety File including drawings, commissioning and test certificates, to be available at substantial completion stage.

Project Supervisor Construction Stage

The contractor will be required, with the prior written consent of his insurance company, in consideration of acceptance of his tender to act as the Project Supervisor (Construction Stage) under the Safety, Health & Welfare at Work (Construction) (Amendment) Regulations SI No 528 of 2021. He will be required to enter into a Collateral Agreement with the Employer to provide the services of Project Supervisor (Construction Stage) and to indemnify the Employer from the consequences of any failure on his part to do so, the agreement to take effect on acceptance of the tender for the works or any agreed modifications thereof.

The contractor acting as Project Supervisor Construction Stage will be required, inter alia:

- to provide the services of Project Supervisor (Construction Stage) by way of Collateral Agreement in consideration of acceptance of his tender.
- to return Safety and Health information to establish competence to provide this service in the form agreed.
- to identify with his tender any aspect of the project which he considers, as a competent Contractor, to be incapable of being constructed in a reasonable safe way.
- to provide a general warranty of competence for the services of the Main Contractor and Project Supervisor (Construction Stage).
- to provide written confirmation that the Insurance Company consent to his acting as Project Supervisor (Construction Stage).
- to develop a Safety, Health and Welfare Plan at least one week before construction commences on site and review and revise as necessary and circulate copies to all parties concerned as necessary.
- to submit a commencement, notice to the Health and Safety Authority.
- to review and revise the Safety, Health and Welfare Plan as the work proceeds circulate copies to all parties concerned as necessary.
- to prepare the Safety File for the building and give the Employers Representative one bound hard copy and two electronic copies on CD on completion of works.
- to co-ordinate the implementation of the general requirements in relation to technical, organisational and/or programming of the works.
- to co-ordinate the implementation of requirements to manage the site properly and advise all workers, sub-contractors, employees and site visitors, etc., of the Health and Safety legislation's requirements.

24. PROTECTION OF THE WORKS

The installations shall be properly protected at all times. Should the measures taken by the Contractor prove to be inadequate, then it shall be the sole prerogative of the Employer' Representative to decide whether repairs may be affected and suitable recompense made to the Employer or whether damaged installations shall be completely replaced. See the above section on making good damage for further details.

At no time is the Employer' Representative obliged to accept anything other than the new totally undamaged, correctly installed and selected equipment. All costs for replacement remain with the Contractor.

25. ACCESS FOR PLANT AND EASE OF MAINTENANCE

Prior to the works commencing on site and plant and equipment placed on order, the Contractor shall check on site the dimensions of all plant / equipment locations and all access doorways, etc. to ensure that each item can be admitted to its allotted position and installed as specified, together with all other services.

Failure of the Contractor to determine that the plant and equipment can be easily installed in its proposed location prior to ordering will result in the replacement of the plant or equipment and the Contractor shall be responsible for all re-stocking and delivery charges etc. associated with the replacement of the plant or equipment.

The Contractor shall also ensure that there is sufficient access available around the new generator prior to the installation to allow easy removal for replacement or maintenance purposes without carrying out any destructive operations.

Installation of equipment shall be arranged to give ease of subsequent removal of electronic motors, thermostats, or other equipment, and of any other item to which it may be reasonably anticipated that maintenance would apply.

Should the Contractor be unable to demonstrate clearly that equipment and plant can be easily removed for maintenance or replacement purposes the Contractor must modify the installation as required at its own costs to provide a level of access that is acceptable to the Employer' Representative.

26. AS INSTALLED RECORD DRAWINGS

When the installation is complete, the Contractor shall supply a set of record drawings in both hard copy and on disk/ USB Stick (AutoCAD 2022 or higher format) showing the layout of the installation as installed, with description, identification and location of all plant equipment, Cable Tray, Trunking routes, etc.

The Contractor will receive a copy of the tender drawings on disk format on their appointment from the Employer' Representative and the Contractor will be requested to update his drawings on disk/USB Stick on a monthly basis to reflect any revisions to the building and the services as installed on site.

On completion of the works the Contractor will be required to produce a copy of the update drawings on disk/USB Stick format, together with a hard copy set of the drawings (A1 size) which shall be handed to the Employer' Representative for checking and approval before final printing.

27. INSTRUCTION TO STAFF IN USE OF APPARATUS

The Contractor shall include in his tender for the instruction of the staff appointed by the Employer to operate the plant and equipment, and he shall also provide instructions for all items of plant and equipment whatsoever supplied by him under this contract, and he shall ensure that these instructions are clearly and fully understood by the personnel to operate such plant and equipment.

All instructions listed above shall first be submitted to the Employer' Representative and their signed approval obtained before they are presented to the Employer.

After the Employer' Representative is satisfied and has witnessed that all plant, equipment and systems are operating satisfactorily, then the Contractor shall arrange to provide the instruction of the end user and staff appointed by the Employer to operate the plant and equipment and shall provide at least 3 weeks' notice to the Employer of the intended date for the demonstrations.

28. OPERATION AND MAINTENANCE MANUALS

The Contractor shall include in their tender for the provision of a safety file incorporating all maintenance / operation instructions, DVD recording of the Client instructions, commissioning / test certificates, record drawings and Declaration of Performance and CE Certificates for the project in accordance with the Safety, Health & Welfare at Work (Construction) (Amendment) Regulations SI No 528 of 2021.

One hard copy shall be provided by the contractor bound in a strong folder, with two copies in disk or USB format also and shall have the Employer' Representative approval before they are handed over to the Employer.

The following is a summary of the relevant information to be included in the safety file:-

1. Contents Sheet

2. **Introduction** Given a general Introduction incorporating an overview of the installation with list of equipment, and their suppliers, with contact names address and telephone / fax numbers.

3. **Operating Procedures** General description of the installed systems, including operating procedures, preliminary checks, start up procedures, operating checks, shut down procedures and emergency shutdown of the following main plant items:
 Section 1 - Standby Generator Set
 Section 2 - Main External Electrical Distribution Cabinet
 Section 3 - Oil Storage tank and Oil line
 Section 4 - All sub-systems Certificates (where appropriate).

4. **Maintenance Procedures** Outline the recommended procedures for maintaining the services.

5. **Equipment Schedules** Provide technical details of all plant and equipment including individual manufactures handbooks, technical literature, relevant catalogue sections, wiring diagrams etc.

6. **Commissioning /**
 Test Certificates The following are a list of the Commissioning/Test Certificates required:
 -
 1. Completion Certificate for the Electrical Services Installation.
 2. Suppliers Commissioning Certificate for the Standby Generator Set.

7. **Declaration of Performance Certificates and CE Certificates.**
 Provide a complete set of the Electrical “Declaration of Performance Certificates” and “CE Certificates” as listed in “Appendix B” at the end of this Document.

8. **Record Drawings** Provide a complete set of “As installed Drawings”:

29. COMMISSIONING AND TESTING

The Contractor shall notify the Employer' Representative in writing when in its opinion, the electrical and mechanical services installation or parts thereof are ready for testing and commissioning. The Contractor shall then carry out the tests required. The Contractor shall prove that all test results are in accordance with the performance-based specification. The Contractor shall then operate the installation or selected parts thereof in the presence of the Employer' Representative and shall make all specified tests to the satisfaction of the Employer' Representative.

Where it is not possible at the particular time of commissioning and testing for full load conditions to be obtained or simulated, the Contractor shall repeat such operations of full load or simulation thereof at a time when this can be achieved.

Where portions of the work are commissioned and tested separately, the Contractor shall, upon substantial completion or completion of section as defined in the contract, demonstrate to the Employer' Representative that all of the several portions are capable of proper co-ordinated simultaneous operation.

In cases where the construction programme is such that the Contractor will need to return to the portion of the building taken over and occupied by the Employer' Representative in order to undertake testing and commissioning, etc., the Contractor shall take all necessary precautions against, and shall be responsible for, any damage caused whilst working in such areas for that purpose.

For the purposes of commissioning and testing of the installation the Contractor shall provide all necessary skilled and unskilled labour and all necessary instruments and testing equipment.

Subsequent to the completion of all testing and commissioning to the satisfaction of the Employer' Representative the Contractor shall operate the plant and equipment and shall demonstrate that the overall systems function correctly in accordance with the requirements of the performance-based specification.

30. SUBSTANTIAL COMPLETION

Substantial completion of the electrical and mechanical services installations and the associated builder's attendances, or agreed phase or part of the works, **shall not be achieved until the Contractor has demonstrated to the satisfaction of the Employer' Representative that the following aspects are complete:-**

- All works are complete other than minor snags or defects which could be reasonably completed within an agreed programme without causing disruption to the Employer or their Agent's use of the building.
- All tests and demonstrations to have been undertaken in the presence of the Employer' Representative as are required in the specifications.
- All final copies of the Record Drawings, Schedules, test and commissioning certificates, including the Declaration and performance and CE Certificates and the Electrical Operating and Maintenance manuals have been supplied in a format agreed with the Employer' Representative.
- All spares, keys, tools, and other materials required by the specification for the running and maintenance of the plant and equipment as specified are to have been supplied and handed over to the Client.
- All instruction of the Employer's staff have been satisfactorily completed and the handing over of the Electrical Operation and Maintenance Manual and drawings have been obtained by the Contractor.

31. LABELLING

The Contractor must provide labelling on all plant, equipment, fuse spur outlets, etc.

All labels must be neat, lined up with other labels (in case of distribution centres, etc.), orientated for easy view and securely fixed. Any labelling installed which does not fit this description shall be removed and replaced as required.

Plant labels shall include the area of the building served by the unit in addition to the unit reference number.

32. FREEDOM OF INFORMATION (AMENDMENT) ACT, 2014

Information in relation to this tender may be available on demand, in accordance with the Freedom of Information (Amendment) Act, 2014.

The Contractor is requested to consider if any of the information supplied by him in this tender should not be disclosed because of its sensitivity. If this is the case, he should, when providing the information, identify same and specify the reasons for its sensitivity. The Client will consult with the Contractor about sensitive information before deciding on any Freedom of Information request received.

Appendix “A”

HANDOVER AND COMPLETION RECORD SHEET FOR THE MECHANICAL AND ELECTRICAL SERVICES INSTALLATIONS

Building Name/ Address: Kiltimagh Further Education and Training Centre, Kiltimagh, Co Mayo- Electrical Upgrade Works 2024		
Electrical and Mechanical Services Installation		
ITEM		Signatures and Date
Element (61): Comprising of the new main electrical distribution centre, sub-distribution centres distribution cables, and new containment systems, etc., are operating satisfactorily.		
Element (62): Comprising of the power distribution services, etc., are operating satisfactorily.		
Element (63): Comprising of the new Normal, Lighting Installations, including the new light fittings and lighting controls, etc., have been tested and are operating satisfactorily.		
Element (64): Comprising of the new data network and public address installations has been tested and is operating satisfactorily.		
Element (65): Comprising of the new intruder alarm installation has been tested and is operating satisfactorily.		
The associated Builders attendances and re-instatement works have been fully completed to the Clients and Employers Representatives satisfaction.		
Two number training and demonstration meetings have been held and the Client / end user have been fully instructed on the operation of the Fire alarm and emergency lighting Systems.		Date Meeting 1: Date Meeting 2:
A DVD recording of the formal handover talks, training and demonstration of the M&E services has been provided by the Contractor and is included in the Operating and Maintenance Manuals.		
The Electrical Operating and Maintenance Manual including all associated test and commissioning certificates, and “As Installed” Drawings, etc., have been handed over to the Client / end user.		
Client Name :	Signed:	Date:
Employers Representative Name:	Signed:	Date:

Appendix “B”

SCHEDULE OF ELECTRICAL DECLARATION OF PERFORMANCE AND CE CERTIFICATES

Item No.	Product	Manufacture/ Supplier/ Standard	Declaration of Performance Cert	CE Cert
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General Items				
1	Metallic Cable Trunking	BS EN 50085-1:2005	√	√
2	Metallic Conduits	BS EN 61386 Class 4 H15	√	√
3	Conductors	BS EN 60228:2005	√	√
4	PVC Cable	PVC 6491 B Zero Halogen Low Smoke	√	√
5	Fire Stopping		√	√

Element (61): Main Distribution				
1.	Main Distribution Centres	Form 4, BS EN 61439-2 : 2012	√	√
2	Sub-Distribution Centres	Form 2, BS EN 61439-2 : 2012	√	√
3.	Fire Stopping		√	√
4.	24 Hr, 7 Day Time Clock		√	√
5.	Surge Protection Equipment		√	√
6.	Fire Main Switch		√	√

GRETB OFFICES, AN COILEAR BAN, ATHENRY, **CO GALWAY, PROVISION OF A STANBY** **GENERATOR FACILITY.**



An tSeirbhís Oideachais Leanúnaigh agus Scileanna
Further Education and Training Authority

VOLUME A.2.3.2.1 - ELECTRICAL SERVICES **SPECIFICATION**

INDEX

VOLUME A.2.3.2.1. - ELECTRICAL SERVICES SPECIFICATION

1. SYSTEMS OF WIRING, MATERIALS AND WORKMANSHIP APPLYING TO SEVERAL SECTIONS
2. ELEMENT (61) ELECTRICITY CENTRE AND MAIN DISTRIBUTION
3. ELEMENT (68) EARTHING
4. ELEMENT (50) SITE MECHANICAL SERVICES
5. ASSOCIATED BUILDERS' ATTENDANCES

SYSTEMS OF WIRING, MATERIALS AND WORKMANSHIP APPLYING TO SEVERAL SECTIONS

1. METALLIC CABLE TRUNKING

Metallic cable trunking shall be a hot dip zinc coated low carbon sheet steel cable trunking supplied in 3.0-metre-long sections and shall conform to the following standards:

- IS EN 50085-1: 2005
- I.S. EN 50085-2-1:2006
- BS EN IEC 61084-2-1: 2024 + A11:2024
- EN 10346:2015, Grade DX5 1D Z275

The trunking sections shall be jointed with cup-sq. bolts and serrated flange nuts (LSN) to ensure earth continuity to EN 50085 without copper earth links.

Trunking shall be erected complete before the insertion of any cables and all entries to trunking shall be placed or so protected as to eliminate the possibility of water entering the trunking. All joints between trunking sections, between trunking and conduit, or trunking and switchgear shall be mechanically sound, and shall be such as to ensure that cables being drawn in shall not suffer any damage or abrasion.

Trunking shall generally be fixed by screwing the back of the trunking to Unistrut sections fixed to the walls or underside of floor slabs or ceilings whichever is appropriate. Cable retainer clips shall be used as required.

All trunking going through fire walls and ceilings shall be fire stopped using Intumescent fire blocks in and around the trunking in the approved manner. (The Contractor and his Electrical Contractor shall determine on site where these fire walls are actually located and provide for all fire stopping of the new LV and ELV trunking system where they pass through the fire walls and ceilings as necessary).

The number of cables to be installed in trunking shall be such as will permit easy drawing in without damage to the cables and shall in no circumstances be such that a space factor of 45% is exceeded.

Cabling within any trunking shall not be grouped together with cable ties, insulation tape or any other similar product.

2. METALLIC CABLE TRAY

Metallic cable tray shall be a hot dip zinc coated low carbon sheet steel medium duty cable tray supplied in 3.0-metre-long sections and shall confirm to the following standards:

- IS EN 61537: 2007
- EN 10346:2015, Grade DX5 1D Z275

The Cable Tray sections shall be Medium Duty Cable Tray, jointed with cup-sq. bolts and serrated flange nuts (LSN) to ensure earth continuity to EN 50085 without copper earth links, which shall be provided with return flanges not less than 25 mm high with the following minimum gauges:

- Minimum gauge of 0.7 mm for sizes up to 225 mm wide
- Minimum gauge of 1.0 mm for sizes greater than 300 mm wide

All cable trays shall be complete with integral couplers, tray dividers, bends, tees, reducers, conduit take-off plates, and fish plates, etc., with a min of 2 number fastenings per section.

Where changes in level or direction or tray occurs, the manufacturers preformed bends, tees, etc., shall be used as far as possible. The Employers Representative approval shall be obtained to the use of site made bends etc.

The manufacturer's support systems shall be used as far as practicable. Jointing details and fixing details shall be in accordance with the manufacturer's recommendations. Cable tray shall be supported at not greater than 1.5 metre centres, but in no case shall the deflection at mid span exceed 10 mm.

3. METALLIC CONDUITS

Metallic conduits shall consist of Class 4 heavy gauge hot dipped galvanised welded steel conduit manufactured from Grade Q195 steel and shall confirm to the following standards:

- BS EN IEC 61386-1: 2008 +A1: 2019
- BS EN IEC 61386-21:2021 +A11: 2021
- BS EN IEC 61386-25:2011
- No conduit system shall be smaller than 20 mm diameter

The capacity of the conduits shall be in accordance with Annex 52A, National Rules for Electrical Installations, as issued by the Electro-Technical Council of Ireland.

All joints in the conduit shall be made by screwed couplings, the insides of all ends of tubes to be rounded and free from irregularities of bore.

CI oblong draw-in, intersection, T joint and other necessary boxes shall be hot dipped galvanised to BS EN 61386 Class 4 and shall be screwed full thread into which the conduit must fit tightly. The tubes are to be properly screwed, and the threads fully worked, so that when finished no rings shall be noticeable on the outside of the tube.

All bends shall as far as possible be made from the conduit and no bends shall have a radius smaller than $2\frac{1}{2}$ times the outside diameter of the conduit. When complete the conduit must be mechanically and electrically continuous throughout and earthed in accordance with Clause 12 of this section and Element (68).

Ventilating outlets shall be provided for the conduits containing every circuit, preferably at their highest and lowest points, so as to allow free circulation of air.

Junction or draw in boxes may only be inserted to facilitate wiring on the expressed approval of the Engineer and on plastered walls; the lids of these are to be flush with the finished plaster.

No cables, etc., shall be inserted until all the conduits and boxes are fixed. All cables shall be drawn in by means of draw-in wires inserted in the conduit at the time of erection and no pull greater than 15 kg is to be exerted. Talc powder shall be plentifully used.

Socketed and screwed brass mouthed bushes shall be used on all ends through which cables or wires are moved in either direction.

Switch boxes shall likewise be of heavy quality galvanised malleable iron or steel, for flush or surface mounting as specified.

Conduits shall be firmly fixed with approved type saddle or crampets to suit the location. The Employers Representative approval to the type of fixing in each location shall be secured when laying out the work.

An approved lubricant shall be used when screw cutting, which must afterwards be carefully removed. All joints in tubing shall be made with galvanised paint.

The conduit shall be run in straight lines as far as possible; no single length to exceed 10 metres without an oblong draw-in box of ample size, readily accessible.

Where connections are to be made to items of equipment these shall preferably be made in electrically continuous galvanised watertight flexible conduit with suitable adaptors.

4. **CONDUCTORS IN TRUNKING OR CONDUIT**

Conductors shall be plain annealed copper single-strand up to and including 2.5 sq. mm and multi-strand over 2.5 sq. mm complying with the following standards where appropriate:

➤ EN 50525: Part 1	➤ EN 50525: Part 2 -11
➤ EN 50525: Part 2 -21	➤ EN 50525: Part 2 -22
➤ EN 50525: Part 2 -31	➤ EN 50525: Part 2 -41
➤ EN 50525: Part 2 -42	➤ EN 50525: Part 2 -51
➤ EN 50525: Part 2 -71	➤ EN 50525: Part 2 -72
➤ EN 50525: Part 2 -81	➤ EN 50525: Part 2 -83
➤ EN 50525: Part 3-11	➤ EN 50525: Part 3-21
➤ EN 50525: Part 3-31	➤ EN 50525: Part 3-41

No joints shall be permitted except at fittings, all wiring being on the loop-in principle. No cables shall be drawn into conduit or trunking until all conduits, boxes and trunking are erected. The maximum pull to be exerted on any cable shall be 15 kg. and talc powder shall be liberally used to ease drawing-in to conduits.

5. **XLPE (LSZH) INSULATED ARMOURED CABLE**

Cross linked polyethylene (XLPE) **Low Smoke Zero Halogen** thermosetting insulated armoured cables for LV distribution system of rated voltages of 600/1000V and 1900/3300 V for fixed installations shall comply with BS 6724: 2016, and IEC 60502-1: 2021, and which shall be suitable for direct installation on cable tray or cable ladder and direct burial installations, and shall also be subject to compliance with the Construction Products Regulation (CPR), to the following construction:

	BS 6724 1kV (600/1000V)	BS 6724 3.3kV (1900/3300V)
Conductors		
Single core	Stranded copper (Class 2) or solid aluminium (Class1)	
Two- core	Stranded copper (Class 2) or solid aluminium (Class1)	N/A
Three- core	Stranded copper (Class 2) or solid aluminium (Class1)	
Four- core	Stranded copper (Class 2) or solid aluminium (Class1)	N/A
Five-core	Stranded copper (Class 2)	N/A
Multicore auxiliary - core	Stranded copper (Class 2)	N/A
Insulation	GP8, GP6 or EIS	
Bedding	Extruded layer of polymeric material compatible with the operating temperature of the cable. HCI levels are not to exceed 0.5%	
Armour		
Single core	Plain aluminium wire	
Two-core and above	Galvanised steel wire	
Outer sheath	Extruded layers of compatible polymeric material conforming to the requirements of LTS 1 specified in BS7655. HCI levels are not to exceed 0.5%	

6. PVC INSULATED PVC SHEATHED, (PVC, PVC) UNARMoured CABLES

PVC insulated PVC sheathed cables shall be the 600/1000-volt grade and shall comply with BS 6004:2012 + A1: 2020 standards. The conductor shall be plain annealed copper with PVC insulation and PVC sheath coloured grey. The cables shall generally be single core but twin, three and four core cables may also be used.

7. **MINERAL INSULATED COPPER COVERED CABLE**

Mineral Insulated copper or copper alloy sheath and copper conductors and their terminations with a rated voltage not exceeding 750V shall comply with the following standards:

- IEC 60702-1: 2002 + A1: 2015. (Part 1- Cables)
- IEC 60702-2: 2002 + A1: 2015. (Part 2- Terminations)
- IEC 60702-3: 2016. (Part 3- Guide for Use)

The whole of the wiring shall be carried out in strict accordance with the maker's instructions and to the approval of the Employers Representative. The maker's cold sealing technique is to be used throughout, special care being taken to ensure that the mineral insulation has been fully removed from the conductors and the copper surface left clean before applying the sealing compound.

At all fittings, switches, plugs or similar positions associated with a concealed installation standard BESA galvanised boxes shall be used, to which shall be fitted the makers standard sealing glands.

All cables shall be securely fitted at sufficient intervals with brass saddles and dome headed screws. In no case shall the saddles be placed at intervals greater than 60 cm, and after erection cable shall be 'dressed' to obtain a neat appearance.

All wiring shall be carried out in two, three or four core cable not less than 1.00 mm² sectional area of conductor. Sizes of cables are given in the appropriate Schedules attached to the end of this specification.

The whole of the wiring shall be arranged on the multiple distribution system, conductors to radiate from the sub-distribution centres. The cable may not be buried direct without protection by conduit tube.

The whole of the sheathing of the cable system shall be electrically continuous across all joints and earthed in accordance with Clause 11, 'Earthing', of this section.

8. WIRING FOR LOW VOLTAGE SYSTEMS

The wiring for systems operating at voltages lower than 50 volts shall, unless otherwise stated be carried out in standard bell or telephone cables. Cables shall be twin or multicore 1.0 mm² copper PVC insulated and sheathed, enclosed in steel conduit run in accordance with Clause 3, of this section.

Where low voltage wiring is permitted to be run on the surface such wiring shall be twin or multicore insulated with PVC and PVC sheathed overall. Where access cannot be had to the cables, such as in ducts between buildings, PVC sheathed cables shall be run in galvanised steel conduit bushed at both ends and arranged so that the cables can readily be drawn out if required.

9. MAIN SWITCHES

Switches shall be superior quality heavy duty metal clad three pole and neutral units, suitable for a supply of 400 volts between phases, 50 cycles AC complying with BS EN IEC 60947-3:2021 +A1: 2025. The switch mechanism shall be such that it shall not be possible to open the casing when the switch is in the "on" position or to close the switch when the casing is open.

All units shall be of the damp proof metal clad type, mounted on insulating material, with protecting fillet between the poles. Contacts shall be preferably laminated and arranged for rapid spring break and terminals shall be of the grip socket pattern. Switches shall be suitable for bolting to busbar chambers and other pieces, to give a single built-up unit.

10. MAIN ELECTRICAL DISTRIBUTION CENTRE

The Main LV Electrical distribution centres shall be a free-standing factory built metal clad cubicle type (fixed to the wall) meeting as a minimum the requirements of **Form 3 of BS EN 61439-2:2021** with front access achieving as a minimum a short time withstand symmetrical fault current of 50 kA RMS for 1 second and 25 kA for 3 seconds, which shall be provided with lockable doors.

The electrical distribution centre shall be capable of accepting incoming cables from the bottom and outgoing cables from the top.

The Main LV electrical distribution centre live busbars, including the neutral bar, shall be fully rated throughout. A removable neutral earth link shall be included and be so arranged that it can be readily accessible via removal of a cover.

All outgoing devices shall have a minimum short circuit capacity of 35 kA, be sized as indicated on the drawings and shall be arranged so as to accept the cabling as indicated.

11. ELECTRICAL SUB-DISTRIBUTION CENTRE

The Electrical sub-distribution centres shall be factory-built wall mounted metal clad assemblies in accordance with **Form 2, Type 2 of BS EN IEC 61439-1:2021 and BS EN IEC 61439-2:2021**, which shall be provided with lockable doors.

The electrical sub-distribution centre shall be capable of accepting incoming cables from the bottom and outgoing cables from the top.

Each electrical sub-distribution centre shall be fitted with a switching device on the incoming supply and outgoing ways shall be protected by miniature circuit breakers. The miniature circuit breakers on the socket outlet circuits shall be of the residual current device type with on/off switch and test button and having a 30 m amp tripping current.

Central Test Units (CPU) shall be provided within the Lighting distribution boards for all self-contained emergency lighting systems and have the following features:

- “On/Off” Control Switch
- “½ Hour /3 Hour” selector switch
- “Emergency Lighting on Test” Indicator
- “Test Complete” indicator
- Interposing relays

When the system is in test mode a 220 Volt signal shall energize one or more interposing relays to break the feeds to emergency points and shall automatically reset after the selected test period.

The interposing relays shall be multipole normally closed relays or contactors rated at 10 amps minimum.

12. EARTHING

All switches, sub-distribution centres, earthing pins of sockets, transformers and all electrical machinery or any metalwork whatsoever adjacent to any of the electrical equipment shall be connected to the conduit and/or the metallic cable sheath which itself is fully earthed. The Contractor and his Electrical Contractor shall include for earthing the main electrical distribution centre to the Supply Authority's earth lead at the supply point generally in accordance with the National Rules for Electrical Installations I.S. 10101: 2020 +AC2: 2025), including the IET Wiring Regulations, 18th Edition, and BS 7671:2018 +A4: 2026.

The earthing of machinery shall be by means of a copper conductor of high conductivity copper and its sectional area shall not be less than 2.5 mm² or less than half the size of the largest conductor feeding the circuit to which the earthing pertains, whichever is the greater. At the main electrical distribution centre, the earth lead shall be of copper strip of not less than half the size of the incoming ESB phase cables. At all joints in the conduit such as boxes, couplings, etc., approved bonding connections shall be provided.

The earthing of the system shall comply fully with National Rules for Electrical Installations I.S. 10101: 2020 +AC2: 2025), including the IET Wiring Regulations, 18th Edition, and BS 7671:2018 +A4: 2026.

The connections to all conduit and metalwork, earthing lead and earthing connection, measured from any position in the installation shall not exceed one ohm resistance.

13. LABELLING

All fuse boards, switch fuses, fused connection units, isolators, controllers, time switches, contactors and the like shall have plainly and clearly indicated on them the services they control by suitable attached labels of bevelled trifoliate or other approved material engraved with 10 mm high letters. In addition, the various fuses shall be labelled or other approved arrangement to indicate the circuit protected.

The Employers Representative' approval for the type of labelling proposed is to be obtained before this work is set in hands. The size of the replacement fuse for each circuit should be indicated in each board. Engraved discs should be fastened to the dividing fillet immediately opposite the respective fuses, so as to enable fuses listed on the fuse board circuit labels to be readily identified.

14. LABELLING OF FIRE ALARM SYSTEM

The Contractor and his Electrical Contractor shall provide for the labelling of all the fire alarm equipment throughout the building. The Contractor and his Electrical Contractor shall use a system of labelling the system by loops i.e. L1/001, therefore Loop 1 / device 1. This then shall correspond with the address on the main central control unit which shall read the device address and location.

A draft copy of all the devices shall be issued to the Employers Representative before commissioning, and this shall be checked to ensure that all room names have the correct device reference.

The labelling of each fire alarm device shall be indicated on the “As Installed” drawings also.

15. LABELLING OF EMERGENCY LIGHTING INSTALLATION

The Contractor and his Electrical Contractor shall provide for the labelling of all the Emergency lighting equipment throughout the building. The Contractor and his Electrical Contractor shall use a 20mm high lettering system, and each fitting shall be given a unique number in a format which shall be agreed with the Employers Representative, with the numbering system indicated on the “As Installed” drawings also.

ELEMENT (61): ELECTRICITY CENTRE AND MAIN DISTRIBUTION

61.1 EXTENT OF WORKS IN THIS SECTION

This section covers the provision of the alterations and additions to the existing Main Electrical Distribution centre in the entrance lobby to the main office building, including the provision of a new external electrical distribution cabinet, including the associated distribution cables, additional LV and ELV cable tray and all associated equipment as indicated on the drawings and as specified below.

This section shall also include for the supply, delivery to site, installation, testing and commissioning/certification of a new standby Generator Set, with each set consisting of diesel engine, electronic governor, sound attenuated weatherproof canopy, battery and engine mounted battery charging alternator, built-in 8 hour fuel storage tank in the base of the unit, generator control panel, etc., which shall be carried out as a specialist supplier to the Electrical Contractor, as indicated on the drawings and as specified below.

This section shall include for the diversion of the existing incoming 3-Phase Electrical supply to the main office building to the new external electrical distribution cabinet by ESB Networks, and all associated ESB Networks Capital Contribution Charges shall be paid directly by the Client.

61.2 ELECTRICITY SUPPLY AND SERVICE

There is a 3-Phase Electrical supply to the GRETB Main Office building, which runs underground at lower ground level and connects to the existing Main Electrical Distribution switchgear which is located in the side entrance lobby to the main office building as indicated on the attached drawings.

It is intended that ESB Networks would disconnect the existing incoming electrical supply cable to the existing main electrical distribution centre in the lobby in the main office building, and pull-back and divert the incoming electrical supply cable to the new external electrical distribution cabinet at lower ground level in the external yard adjacent to the side entrance to the building, which shall be run underground to the new external electrical distribution cabinet, which shall be enclosed externally within a 125 mm dia “Red” ESB ducting system in a 750 mm deep sanded trench as indicated on Drawing No 6941/E60/01.

ESB Networks shall also disconnect and reposition the existing ESB Networks CT meter and the associated CT's and ESB Networks cut-out fuses to the new external electrical distribution cabinet as necessary.

All ESB Networks Capital Contribution Charges associated with the disconnection and diversion of the incoming electrical supply cable to the new external electrical distribution cabinet at lower ground level in the external yard adjacent to the side entrance to the building, including the disconnection and repositioning of the existing ESB Networks CT meter and the associated CT's and ESB Networks cut-out fuses to the new external electrical distribution cabinet shall be paid directly by the Client.

The Contractor shall provide all attendances as required by ESB Networks in the disconnection of the existing incoming electrical supply and the diversion and re-connection of the 3 Phase Electrical Supply to the New Main Electrical Distribution Centre, including the repositioning of the existing ESB Networks CT meter and the associated CT's and ESB Networks cut-out fuses as necessary.

61.3 EXISTING MAIN ELECTRICAL DISTRIBUTION CENTRE

The existing Main LV Electrical distribution centre which is located in a lobby at the side entrance to the main office building shall be retained, and the Contractor shall include in their tender for the following remedial works as detailed on Drawing No 6941/E61/01:

- Disconnection and removal of the existing 200-amp TP Main MCCB.
- Supply, installation and connection to the existing busbars of a new 200-amp TP&N main isolator.
- Provision of attendances to ESB Networks in the disconnection and repositioning of the existing ESB Networks CT Meter and the associated ESB Networks CT's, fuse cut-out units, including the remote meter monitoring equipment to the new external electrical distribution cabinet.
- Provision of the updating of the labelling at the existing main electrical distribution centre as necessary.

61.4 NEW EXTERNAL ELECTRICAL DISTRIBUTION CABINET

The New Main LV External Electrical distribution cabinet shall be located externally in the lower yard adjacent to the plastered section of the stone retaining wall and shall be a free standing factory built **IP66** metal clad cubicle type (fixed to the wall) meeting as a minimum the requirements of **Form 3 of BS EN 61439-2:2012** with front access achieving as a minimum a short time withstand symmetrical fault current of 50 kA RMS for 1 second and 25 kA for 3 seconds and shall incorporate a client 200 amp automatic change over-switch.

The New Main LV External Electrical distribution cabinet shall consist of 2 number compartments (Section No 1-ESB Networks and Section No2 -consumer equipment and connections) and be manufactured from 3mm sheet steel, galvanised both internally and externally to **BS EN 1461: 2022**, with Bitumen Paint applied externally on the planting depth, complete with internal separation panel, 2 number hinged fully removable lockable doors with rubber gasket seal providing a IP66 rating, solid stainless steel hinges, and Tri-head tamper proof lock, with an internal backboard made form 12mm thick exterior grade marine plywood treated with low flame spread wood preservative, earth lead connections from the pillar body to the doors and a “Danger” warning label fitted to the doors.

The New Main LV External Electrical distribution cabinet shall be capable of accepting incoming cables from both the bottom and top and outgoing cables from the bottom.

The New Main LV External Electrical distribution cabinet live busbars, including the neutral bar, shall be fully rated throughout. A removable neutral earth link shall be included and be so arranged that it can be readily accessible via removal of a cover.

The main incoming isolator shall incorporate an integral shunt trip which shall be operated by means of a Fireman’s switch located at high level within the side entrance lobby. The Fireman’s switch shall comply with Section 537.6 of the ETCI Regulations.

The re-setting of the shunt trip after operation of the fireman’s switch shall be undertaken manually at the New Main LV External Electrical distribution cabinet.

The New Main LV External Electrical distribution cabinet shall be of Parkmore Switchgear, Systemax, Hughes and Coyle, Anord, Square D (Schneider Electric), Merlin Gerin, Cubic construction, or equivalent manufacture.

Full general arrangement drawings of the New Main LV External Electrical distribution cabinet shall be submitted to the Employers Representative for approval prior to manufacture.

The New Main LV External Electrical distribution cabinet shall be provided with lockable Doors, which shall be kept locked at all times to prevent unauthorised access, and shall be provided with a “Warning Notice” on the outside of the doors to indicate the presence of an Electrical hazard.

61.5 STANDBY GENERATOR FACILITY

The Contractor shall arrange with a specialist supplier for the supply, delivery to site, installation, testing and commissioning/ certification of a standby Generator Set, which shall be carried out as a specialist supplier to the Contractor, as indicated on the drawings and as specified below.

The standby Generator Set shall be as manufactured by Messrs FG Wilson or equivalent manufacture, (Irish Suppliers Messrs FG Wilson Engineering (Dublin) Ltd, Block P, Ballymount Drive, Ballymount Industrial Estate, Walkinstown, Dublin 12, Tel No: 01-4267366), Model Ref: **TRIGEN P88-BD-GX**, with an 88 KVA 3-Phase, 50 Hz electrical output, and complete with the following components:

- P88 diesel engine mounted on anti-vibration mounts on a high grade, heavy-duty galvanised steel frame (c/w lifting points) with a powder coated paint finish suitable for a marine environment, in accordance with ISO 8528-1 and ISO 8528-2.
- P88-6 electronic governor/ alternator (IP23 Protection), c/w automatic voltage regulator in accordance with ISO 8528-3.
- Sound attenuated weatherproof canopy (CALG1), complete with viewing window, side hinged doors and lift-off end panels and a powder coated paint finish suitable for a marine environment. (This item is required to be shipped separately from the engine)
- Heavy duty lead acid battery and engine mounted battery charging alternator,
- Built-in FBC2 8-hour fuel storage tank in the base of the unit,
- ComAp AMF-25 automatic start generator control panel (CE Certified) and 4 Pole circuit breaker,
- Industrial Silencer (10 dBA reduction) complete with flexible bellows.
- Radiator with 50 % Antifreeze (protection to -36⁰ C) and (WH) coolant heater.
- Coastal Insulation protection and RFI Filter.
- Fuel level switch and low fuel level shut-down, c/w high and low fuel alarm.
- Anti-condensation heater and panel circuitry.
- Earth Fault, Earth Leakage and overload via alarm switch on breaker.

The Generator set measures approx. 1980 mm long by 890 mm wide by 1398mm high and weighs about 1100 kg including the Sound attenuated weatherproof canopy (1085kg excluding the canopy).

The Contractor shall include in his tender for the commissioning and certification of the standby Generator Set by the Specialist Suppliers, and for issuing a commissioning certificate to the Employers Representative.

61.6 DISTRIBUTION SYSTEM

New Power and control Distribution cables between the existing Main Electrical Distribution Centre, the New Main LV External Electrical distribution cabinet and the new standby Generator set shall be in PVC/SWA/XLPE (LSOF) cable run externally in 125 mm dia RED PVC ducts in 600 mm deep sanded trenches as detailed on the Drawings. The size of distribution cables shall be as indicated on Drawing No 6941/E60/01 and 6941/E61/01 as follows:

Cable No	Between	Cable Size
1	The existing main electrical distribution centre and the new external electrical distribution cabinet	4 x 70.0 mm ² PVC/SWA/XLPE (LSOF) cable + 1 x 35.0 mm ² PVC/SWA/XLPE (LSOF) earth cable.
2	The new external electrical distribution cabinet and the new standby Generator set	4 x 70.0 mm ² PVC/SWA/XLPE (LSOF) cable + 1 x 35.0 mm ² PVC/SWA/XLPE (LSOF) earth cable.
3	The new external electrical distribution cabinet and the new standby Generator set	8-core x 1.5 mm ² PVC/SWA/XLPE (LSOF) control cable.
4	The new external electrical distribution cabinet and the new standby Generator set	4-core x 2.5 mm ² PVC/SWA/XLPE (LSOF) cable.

61.7 CABLE TRAY

and control cables to sizes and runs as indicated on the drawings, as specified in General Clause No 2. The steel cable tray shall be fixed to walls, ceiling or building structure as indicated on the drawings. It shall be provided complete with integral couplers, tray dividers, bends, tees, reducers, conduit take-off plates, earth straps and fish plates, etc., as required for a complete installation.

61.8 FIREMAN SWITCH

The Contractor shall include for the supply and installation of a new fireman switch at high level in the side entrance lobby to the main office building adjacent to the existing main electrical distribution centre as indicated on the drawings and as specified below.

The fireman switch shall have a IP65 rating and shall be manufacture from non-flammable aluminium material (with normally closed contacts in the on position), painted in RED complying with IEC 60947-3:2021 +A1: 2025 and BS 7671:2018 + A4:2026, Model Ref: KSF325TPN as manufactured by Messrs ABB or equivalent manufacture.

The Contractor shall provide for the wiring between the fireman switch at high level in the side entrance lobby to the main office building adjacent to the existing main electrical distribution centre and the new main MCCB c/w shunt trip at the new Main LV External Electrical distribution cabinet in 2-core 1.5mm² loop “Prysmian FP Plus” Fire Alarm cable (**rated @ 120 min in accordance with I.S. EN 50200 and BS 8434-2:2003 + A2: 2009**) run externally in a 125 mm dia RED PVC duct in a 600 mm deep sanded trench.

ELEMENT (68): EARTHING

68.1 EXTENT OF WORKS IN THIS SECTION

This section shall cover the provision of the earth electrode for any new installation, the connection between the electrode and the main earthing terminal for the main office building and the connection of the following to the main earthing terminal: -

- Neutralizing conductor from the ESB Neutral.
- Protective earth conductors for the installation.
- Main equipotential bonding conductor.

The earthing system generally shall comply with the following sections of the National Rules for Electrical Installations I.S. 10101: 2020 +AC2: 2025), including the IET Wiring Regulations, 18th Edition, and BS 7671:2018 +A4: 2026.

Chapter 4- Part 41: Protection for Safety, Protection against electric shock.

Chapter 5- Part 54: Earthing arrangements and protective conductors.

68.2 EARTH ELECTRODE

The earth electrode shall consist of an earth rod of copper clad steel or galvanised iron of minimum dimensions 16 mm dia. by 1.2 m long driven vertically into the ground or of bare copper conductor or galvanised iron rod of minimum 16 mm dia. and 4.5 m long buried 500 mm in the ground, complying with ETCI Regulation 542.2.

The point of connection to the earth electrode shall be marked with a 50 mm thick concrete cover stamped 'Earth Electrode' as detailed in the ETCI Regulations.

68.3 MAIN EARTHING TERMINAL

The main earthing terminal shall consist of a bare copper bar of a minimum cross-sectional area equal to the largest protective earth conductor. The bar shall be incorporated in the Main LV switchboard and shall be fitted with adequate terminals which shall ensure that no more than two conductors shall be under the one terminal.

68.4 EARTHING CONDUCTOR

The earthing conductor shall connect the earth electrode to the main earthing terminal for the installation. The earthing conductor shall be an insulated copper conductor having a cross-sectional area in accordance with the following table: -

Cross Section Area of Phase Conductors	Cross Sectional Area of Earthing Conductor
Smaller or equal to 16 mm ²	10 mm ²
16 mm ² to 35 mm ²	16 mm ²
Larger than 35 mm ²	Half conductor size

68.5 NEUTRALIZING CONDUCTOR

The neutralizing conductor between the main earthing terminal and the E.S.B. neutral shall be an insulated copper conductor. The conductor shall have the same cross-sectional area as that of the earthing conductor between the main earthing terminal and the earth electrode and may be a conductor of a multicore cable or a separate earth conductor insulated for system voltage.

68.6 PROTECTIVE CONDUCTORS

Protective conductors shall be provided between the main earthing terminal and each distribution board. This shall have a minimum cross-sectional area as set out in Table 54F of the ETCI Rules as follows:

Cross Section Area of Conductor, mm²	Cross Sectional Area of corresponding protection conductors, mm²
Smaller or equal to 16 mm ²	Same area as conductor
16 mm ² to 35 mm ²	16 mm ²
Larger than 35 mm ²	Half conductor size

Protective conductors shall be insulated in green-yellow coloured PVC as specified.

It may form one core of a multi-core cable or else be a separate cable run alongside the supply cable.

68.7 EQUIPOTENTIAL BONDING

Equipotential bonding shall be carried out in accordance with Clause 547 of the ETCI National Rules for Electrical Installations.

Incoming metallic services (**including Gas pipework**) and the extension of these services in metal pipes within the building shall be connected to the main earthing terminal at the main switchboard by means of an insulated stranded copper conductor of 16 mm² minimum cross-sectional area.

Metallic services and equipment in the toilet areas and kitchen shall all be bonded together by means of insulated standard copper conductor of 4 mm² minimum cross-sectional area and such local bonding conductor shall be connected to a protective conductor which in turn shall be connected to the main earthing terminal at the main switchboard.

68.8 BONDING OF KITCHEN EQUIPMENT

The Contractor shall allow for the earth bonding of each item of static kitchen furniture and equipment in accordance with the ETCI Wiring Rules.

The Electrical Contractor shall ascertain the exact method of making each earth connection.

Where earth clamps are used these shall be suitable for damp environmental conditions, identified by a blue dye mark. Earth clamps exhibiting red dye marks will be rejected.

68.9 TESTING

The whole of the earthing systems and arrangements shall be tested using the appropriate earth testing instruments and the results, shall be logged and a copy forwarded to the Employers Representative for their records.

The Employers Representative shall be advised in advance of the testing being carried out so as to give them an opportunity to witness the said tests.

ELEMENT (50): SITE MECHANICAL SERVICES

50.1 EXTENT OF WORKS IN THIS SECTION

This section includes for the provision of an oil storage facility for the standby generator set, consisting of the supply and installation of a new 1300 Litre Double Skin Medium-density Polyethylene (MDPE) self-bunded oil storage tank, including the provision of a continuous 20 mm internal diameter PVC coated copper tubing oil line between the new oil storage tank and the standby generator set, as indicated on the drawing and as specified below.

50.2 NEW OIL LINE

The Contractor shall include in his tender for the provision of the new oil storage line between the new oil storage tank and the new standby generator set, which shall be carried out in a continuous 20 mm internal diameter PVC coated copper tubing or equivalent, laid in a 100 mm dia PVC pipe in a 600mm deep sanded trench, turned up at the new oil storage tank and the generator set as indicated on the drawing.

The new 20 mm dia oil line shall connect to both the new oil storage tank and the new standby generator set as indicated on the drawing and the Contractor shall provide the necessary couplings /adaptors, the quarter turn isolating valves at each end as required.

The contractor shall also provide for a section of Unistrut Bracket to the new oil line where it rises from underground to the new oil storage tank to protect the new oil line from any future damage.

50.3 NEW OIL STORAGE TANK

The Contractor shall provide for the supply and installation of a New 1300 litre (300 gallon) Horizontal Rectangular “Eco Safe Self-Bunded” Medium-density Polyethylene (MDPE) oil storage tank Model Ref: Titan ES1300 as indicated on the drawing, as manufactured by Messrs Kingspan GSP Ltd, Dundalk Road, Carrickmacross, Co Monaghan, Telephone No: +353 42-9690022, or equivalent manufacture.

The tank shall be fabricated in “Double Skin” moulded Medium-density Polyethylene (MDPE) with ultra-violet stabiliser and shall be tested to 20 psi. The tank shall measure approx. 1920 mm long x 1230 mm wide x 1300 mm high which shall be supported on new pre-cast concrete lintels on 2 number cradle supports.

Filling and venting shall be through a Moulded Access Cap at the top of the tank and draw-off through a 25 mm BSP insert. The tank shall be provided with a padlock c/w 2 No Keys for the Moulded Access cap which shall be handed over to the Client.

The isolating valve on the oil storage tank shall be the lock shield pattern complete with operating key. The key for operating this valve shall be handed over to the Client also.

The oil storage tank shall also be provided with a “Watchman Access” tank pack consisting of a “Watchman SENSiT” smart Wi-Fi tank level monitoring system, complete with transmitter, receiver, phone app and all associated accessories as supplied by the oil tank manufacture.

ASSOCIATED BUILDERS' ATTENDANCES

EXTENT OF WORKS IN THIS SECTION

This section includes for the provision of builders attendances associated with the provision of a standby generator facility, consisting of the construction of the new generator compound, including the provision of the supports of the new oil storage tank, including the provision of the PVC ducting and trenching for the electrical cables and the new oil line and all associated re-instatement works, as indicated on the drawing and as specified below.

NEW GENERATOR COMPOUND

The Contractor shall include in his tender for the construction of a new generator compound adjacent to the existing Bin Storage compound, consisting of a new concrete base on hardcore, including a timber enclosure, c/w pedestrian gate, etc., as indicated on the drawings and as specified below, and the exact setting out of the new generator compound shall be agreed on site prior to the works taking place.

The Contractor shall carefully remove the existing shrubs (which shall be re-used) and he shall excavate the base for the new generator compound to a depth of approx. 400 mm and shall remove and properly dispose of all redundant materials from site in accordance with the local authorities' requirements.

The new concrete base for the generator compound shall consist of a min 200 mm thick 35N/20 concrete base with a layer of A252 reinforcement on a min of 200 mm of compacted hard-core.

The Contractor shall include in his tender for the construction of the timber enclosure to the new generator compound which shall match the existing timber enclosure to the adjacent Bin Store, which shall be constructed from a 100 mm x 100 mm pressure treated timber frame, and clad in 165mm x 32 mm pressure treated timber cladding, c/w a pedestrian gate as detailed on Drawing No 6941/BLD/01.

The Contractor shall carefully remove a section of the existing concrete curbs to allow for the construction of the new generator compound and shall re-use the existing concrete curbs to create a new planted bed area adjacent to the new generator compound and re-sow the shrubs in the new planter bed as necessary.

The Contractor shall also make good to the existing concrete and tarmac finishes adjacent to the new generator compound, which have been disturbed by the above works as necessary.

NEW OIL STORAGE SUPPORTS

The Contractor shall include in his tender for the construction of a new oil storage tank support adjacent to the existing oil storage tank, consisting of a new concrete base on hardcore, including 10 number concrete lintels on 2 number concrete cradle supports, etc., as indicated on the drawings and as specified below, and the exact setting out of the new oil storage tank supports shall be agreed on site prior to the works taking place.

The Contractor shall carefully excavate the base for the new oil storage tank to a depth of approx. 400 mm and shall remove and properly dispose of all redundant materials from site in accordance with the local authorities' requirements.

The new concrete base for the oil storage tank shall consist of a min 150 mm thick 35N/20 concrete base with a layer of A252 reinforcement on a min of 200 mm of compacted hard-core.

The Contractor shall include in his tender for the construction of the 2 number 600 mm high concrete cradle supports in 225 mm concrete blockwork and shall supply and install 10 number pre-cast concrete lintel supports on the 2 number concrete cradle supports as detailed on Drawing No 6941/BLD/01.

NEW TRENCHING AND PVC DUCTING.

The Contractor shall include in his tender for the provision of the trenching and the associated PVC ducting for the proposed new mechanical and electrical services associated with the provision of the standby generator facility as follows:

- Provision of a 100 mm dia PVC duct in a 600 mm deep sanded trench between the new oil storage tank and the new generator compound.
- Provision of 2 number 125 mm dia RED PVC ducts in a 600 mm deep sanded trench between the new generator compound and the wall to the rear of the new Main LV External Electrical distribution cabinet.
- Provision of a 125 mm dia RED PVC duct in a 600 mm deep sanded trench between the new Main LV External Electrical distribution cabinet and the side door to the main office building, connecting to the existing PVC duct being retained.
- Provision of a 125 mm dia RED PVC duct in a 750 mm deep sanded trench in the vicinity of the new Main LV External Electrical distribution cabinet, to facilitate the diversion of the existing incoming ESB Networks electrical supply, complete with lean mix concrete, marker board and marker tape in accordance with ESB Network requirements/ specification.

- Provision of 2 number 100 mm dia cores in the plastered section of the stone wall, approx. 600 mm below ground level.

The Contractor shall also make good to the existing concrete, tarmac and gravel finishes adjacent to the above trenching, which have been disturbed by the above works as necessary.