

CBS THURLES SECONDARY SCHOOL

**CLASSROOM EXTENSIONS &
WOODWORK ROOM ALTERATIONS**

TENDER DOCUMENTS

**VOLUME A
WORKS DESCRIPTION - SERVICES ENGINEERS**

**SECTION 1
ELECTRICAL SPECIFICATION**

June 2017



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1.0 GENERAL CONDITIONS & NON TECHNICAL PARTICULARS

This specification covers the standard requirements for the supply, assembly, installation, connecting up, testing and setting to work of the Electrical installations for this project.

1.1 Project Particulars

Project Name CBS Thurles Secondary School –
Classroom Extensions & Woodwork Room Alterations

Site
Name: CBS Thurles Secondary School,
Address/Location: Rossa Street, Thurles, Co. Tipperary.

Employer
Name: Board of Management CBS Thurles Secondary School
Address: Rossa Street, Thurles, Co. Tipperary

Architect
Name: DH Ryan Architects
Address: 1 Liberty Square, Thurles County Tipperary
Contact: Hugh Ryan
Telephone: 0504 28850
Email: hugh@dhryan.ie

M&E Consulting Engineers
Name: Fahey O’Riordan Consulting Engineers
Address: Shanaclogh, Cappawhite, Co Tipperary
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Project Supervisor Design Process
Name: DH Ryan Architects
Address: 1 Liberty Square, Thurles County Tipperary
Contact: Hugh Ryan
Telephone: 0504 28850
Email: hugh@dhryan.ie

Quantity Surveyor
Name: N/A
Address:
Contact:
Telephone:
Email:

Civil / Structural Engineers
Name: PJ Brett & Associates
Address: Tirol House, Tyone, Nenagh Co. Tipperary
Contact: PJ Brett
Telephone: 067 37950
Email: pjbrett@pba.ie

The Contractor

Reference to "The Contractor" shall always indicate the contracting company to which the Particular Specification refers.

1.2 Contract

The Contract Form shall be as detailed in the Main Document
Submission of a tender shall be taken as acceptance of the proposed contract form.

1.3 Assignment Or Transfer Of Contract

The contractor shall not assign all or any part of the work to another company, firm or individual without prior written consent of the Employer's Representative.

1.4 Drawings

Electrical Services Drawings

The Electrical services tender drawings are listed in the Drawing and Document schedule included as an appendix to this document.

Mechanical Services Drawings

The Mechanical services tender drawings are listed in the Drawing and Document schedule included as an appendix to this document.

Architectural Drawings

Architectural drawings are as scheduled in the as scheduled in the Main Contract Document, and are available from the Main Contractor.

Structural Engineering Drawings

Structural Engineering drawings are as scheduled in the Main Contract Document, and are available from the Main Contractor.

It is the sole responsibility of the Contractor to apprise himself of details or information contained on the above drawings or accompanying specifications, which may impact on the works.

1.5 Site Description & Access

The site for the proposed Classroom Extension & Woodwork Room Alterations is located on the existing CBS Thurles Main Building at Rossa Street Thurles Co Tipperary. The site is located on its own grounds within an enclosed site, in and adjacent to the existing school building with pedestrian and vehicular entrance gates. It is proposed to complete the Building works on an operational school campus which will require close co-ordination with the School Authority on operational matters.

The contractor's normal access to the Building works shall be via the main entrance from Rossa Street.

For full details refer to the Preliminary Health and Safety Plan accompanying this specification.

1.6 Management of the Works

The Contractor shall assign full time to the project a competent supervisor who shall have sole responsibility for, and make all decisions regarding site operations.

The Contractor shall prepare a programme, based on network analysis techniques, for the completion of the Works within the Contract period.

The Contractor, or his authorised representative, shall attend site progress meetings which will be held at regular intervals (minimum fortnightly). The Contractor shall be responsible for informing sub-contractors and suppliers as are necessary that their attendance at progress meetings will be required.

Where a contract will be carried on at the same time as one or more independent contracts on the same site, the Contractor shall liaise as necessary with other Contractors. The client's representative's decision regarding inter-contractor issues (use of available work areas, programming of related work, etc.) shall be final.

This Contractor shall liaise with all relevant authorities, e.g. Employer, etc. regarding access to and availability of the site.

No work of any kind, payment for which is to be made in accordance with a record of time and material, shall be executed unless complete arrangements for such are specially authorised by the Client's representative **in writing** beforehand.

Daywork Sheets, specifying the time and materials employed on each Daywork item, shall be submitted to and signed by the Client's representative or his authorised Agent on or before the expiration of the week following that in which such work shall have been done. One unpriced copy of such Daywork Sheets shall be forwarded to the Engineer/Client's representative followed within 14 days by priced copies in duplicate.

The Client's representative must be advised, in advance or within seven days, of any works considered by the Contractor to constitute a variation to the contract. This will apply whether the works are caused by circumstances within the Contractor's control or not. Costs incurred by such variations will only be considered for payment if they comply with this procedure. Variations to the Contract shall only be carried out when clearly instructed in writing by the Client's representative.

The Contractor shall give the Client's representative each week a return of the number and descriptions of tradesmen and general labourers employed on the Works including those employed by specialist sub-contractors listed separately.

1.7 Quality

Contractors, sub-contractors and suppliers shall be ISO 9000 certified. Where such certification is not achieved, the contractor shall, on request, provide satisfactory evidence of quality control systems that meet with the Client's representative's approval.

The Contractor shall guarantee the performance of the entire installation and all items forming part of the installation. The defects liability period shall be as set out in the Form of Tender and shall extend from the Date of Practical Completion for that period. The Contractor shall make good any defects which occur during this period. Failures of consumable items (e.g. lamps etc) during the defects liability period shall be rectified by the contractor at his expense.

The contractor shall ensure that all materials and equipment are new unless otherwise specified and shall handle store and fix materials and equipment with care to ensure that they are in perfect condition when incorporated into the works.

The contractor shall handle, store and fix each material and item of equipment in accordance with the manufacturer's recommendations and submit copies of manufacturer's recommendations to the Building Services Engineer when requested.

The Employer may appoint an Inspector. Neither the appointment nor the action of the Inspector will invalidate the responsibilities of the Contractor. The Inspector will have no power to authorise variations to the work.

Assessment of the quality of materials and workmanship shall be made in the presence of the Engineer or his representative, unless otherwise instructed.

The Contractor shall conform to all Local Authority requirements with regard to regulations, inspections, permissions to erect hoardings, demolitions, clearance, etc., as applicable.

The Client's representative shall be notified in writing, a minimum of five working days in advance, of the performance of any tests or commissioning procedures being undertaken by the Contractor and any of his sub-contractors, suppliers, etc. in order to allow for witnessing of such tests by the ER. Where notice is not given in accordance with these requirements the tests shall be repeated at the ER's request.

1.8 Security

All personnel working on or attending the site will be required to have valid photo identification (Safepass). The names of all contractor personnel shall be submitted to the employer on a weekly basis.

Personnel and materials entering and leaving the site may be searched.

Photographs of any part of the site may not be taken without the written permission of the employer.

Documents shall be restricted to the use of the Contractors staff and must not be issued to third parties, other than members of the Project Team, unless authorised in writing by the Client's representatives.

The Contractor shall not impede or interfere with the Security Systems and procedures in use by the Employer.

1.9 Project Timescale and Restrictions

The project will commence on appointment and will progress strictly in accordance with the programme as set out in the main contract documents / Preliminary Health and Safety Plan. The contractor shall comply with the requirements and restrictions as set in the preliminary plan.

1.10 Working Drawings

The Engineers are not obliged to produce any working drawings and the tenderer shall note that the drawings accompanying this enquiry will not be detailed further.

It is the sole responsibility of the successful tenderer to produce working drawings, which are to be detailed sufficiently to allow site operatives to install the services without the necessity for site design.

The contractor shall prepare and submit for the approval of the Engineer, working drawings for all systems to be installed under this Contract, together with such schedules of data, calculations and other information called for by the Engineer **within 14 days of contract award**. These works shall include the following:

- Equipment schedules and technical specifications
- Equipment installation co-ordination and equipment layouts.
- Ducting and Piping Routes for all services
- Control drawings and schedules
- Builders works setting out drawings and details

The tendered figure shall include for the design development and production of all of the above. Allow a minimum of 5 working days response time from the Client's representatives.

1.11 Site Meetings

The following information must be presented in writing to the Engineers at least 1 full working day prior to the site meeting:

- Updated programme and progress report
- Cost report, including notification of all actual or potential variations
- Costs associated with any agreed variations
- Site manpower for previous period
- Listing of information required
- Equipment and material status
-

1.12 Commissioning

The Contractor shall provide the Client's representative with a schedule of all commissioning and testing procedures and dates giving at least 5 working days notice of same. Facilities shall be provided for the Employer's Representative to witness all testing and commissioning.

1.13 As-Installed Drawings and O & M Manuals

Two full sets of hardcopy drawings and manuals in strict compliance with the Specifications, shall be required for this project and in addition two soft copy sets shall be provided on disk or memory stick.

Record drawings shall be required as hard copies and on disc in AutoCAD Release 2008 (or later) format.

The Contractor shall be supplied with a full set of tender drawings, which shall be retained on site and marked up as the project progresses. The marked-up drawings shall be made available at site meetings for inspection.

Reservation of copyright will not be permitted. All technical submissions and drawings including electronic and printed material shall become the property of the client.

1.14 Site Access and Delivery of Materials

The Contractor will arrange site access for materials and plant.

The Contractor shall check the dimensions of all materials and plant prior to delivery to site and ensure adequate turning circles and access is available.

1.15 Health, Safety and Welfare at Work

The project design and construction shall be executed in accordance with the Health, Safety and Welfare at Work (Construction) Regulations 2006-2013. In this regard, the Contractor shall be aware of the Regulations, and the specific details that are contained in the accompanying Preliminary Health and Safety Plan. The format for all agreements under this act shall be in accordance with the format set down by the IEI (Institution of Engineers of Ireland/ACEI Association of Consulting Engineers of Ireland)/of copies of which can be obtained on request.

Comply with all safety, health and welfare regulations, whether statutory or deriving from the Employer or other bodies having powers, regarding all work done, including work done by sub-contractors.

The Contractor shall appoint a Safety Officer to visit the site as often as necessary, but no greater than monthly intervals, to ensure that safety requirements are being observed. The Safety Officer shall prepare a written report of each visit which highlights the safety procedures and practices being observed and any deviations from them. A signed copy of the written report shall be submitted to the Client's representative.

The Safety Officer shall notify the Main Contractor, in writing, of all breaches of safety regulations or dangerous practices which are observed and are the responsibility of the Main Contractor, the Employer, other contractors, companies or individuals on the site.

1.15.1 Project Supervisors

The Project supervisors are as indicated in section 1.1 above.

1.15.2 Contractors with Design Input - General Duties of Designers -

Where a contractor designs any element of the works (or engages someone else to design it on his behalf) as part of his contract, the contractor has a statutory obligation to perform the duties set out in Section 16 of the regulations in relation to those parts of the works. These are:

- a) Take account of the general principles of prevention as specified in the Third Schedule of the Principal Regulations (S.I.10 of 2005) and any relevant Safety and Health Plan or Safety File prepared in accordance with the Health Safety and Welfare at Work (Construction) Regulations 2006-2013.
- b) Co-operate with the Project Supervisor appointed for the Design Process or the Project Supervisor appointed for the Construction Stage, as appropriate, to enable that project supervisor to comply with these regulations.

- c) Promptly provide the Project Supervisor appointed for the Design Process or the Project Supervisor appointed for the Construction Stage, as appropriate, with such information as is known to that person regarding particular risks to the safety and health of persons at work as referred to in the First Schedule which may be associated with the project and also with such information regarding the nature and scope of the project to the extent necessary to enable the project supervisor to comply with these Regulations.
- d) Take into account any directions from the Project Supervisor appointed for the Design Process or the Project Supervisor appointed for the Construction Stage, as appropriate.

1.15.3 Safety File

Under Section 15 of the Regulations, each Designer is required to provide the Project Supervisor (Construction Stage) with relevant health and safety information to be taken into account during any subsequent construction work (which would include for instance maintenance, upkeep etc.). This might include such information as:

- a) Drawings showing the part of the works for which the Designer is responsible.
- b) The general design criteria adopted.
- c) Details of the construction or installation including manufacturer's instructions for the installation of proprietary elements, pipe layouts, wiring routes and diagrams.
- d) Information considered relevant to the maintenance of the construction or installation.

1.15.4 Co-ordination of Persons Engaged in the Design of the Project

In accordance with Section 11 of the Regulations it is the duty of the Project Supervisor for Design Process to co-ordinate the activities of persons engaged in the design of the project.

1.15.5 Preliminary Health and Safety Plan

To enable the Project Supervisor for Design Process to prepare the preliminary Health and Safety Plan for the project and where the timing permits it is necessary for the contractor to give the information which is relevant to the requirements of the Regulations in relation to that part of the works for which they are tendering:

- A general description of the works.
- The time in which it is intended that the works will be completed.
- Work which will involve Particular Risks as defined in Schedule 1 & 2 of the Regulations.

1.15.6 Health and Safety Plan for Project

To enable the Project Supervisor for Construction Stage to develop or amend the Health and Safety Plan for the project where a contractor with design input is appointed after the Preliminary Health and Safety Plan has been prepared by the Project Supervisor for Design Process it is necessary for the sub-contractor to give the Project Supervisor for Construction Stage information which is relevant to the requirements of the Regulations in relation to that part of the works for which they are tendering:

- A general description of the works
The time in which it is intended that the works will be completed
- Work which will involve Particular Risks as designed in Schedule 1 & 2 of the Regulations

1.15.7 Contractor to Check All Matters

The contractor is to examine the site and the information supplied regarding the nature and extent of the proposed works so as to be satisfied as to what is required to be done to fulfil the duties in relation to the design and preparation for the works and also what measures are required to be taken to meet the requirements of the Regulations in the execution of the works including

complying with the Health and Safety Plan. All costs arising in respect of these obligations are to be included in the tender figure and the Client will not be liable for any such costs which are reasonably foreseeable and which are not so included.

1.16 Patent Rights

The contractor shall ensure costs of all materials and equipment supplied includes for costs associated with patent rights and royalties arising from use of any such materials and equipment.

1.17 Verify Existing Conditions

The contractor shall before commencing work examine all adjoining work on which this work is in any way dependent for perfect workmanship according to the intent of this specification and report to the Employer's Representative any condition which prevents performance of first-class work. NO "waiver of responsibility" for incomplete, inadequate or defective adjoining work will be considered unless notice has been filed before submittal of a proposal.

1.18 Co-Ordination

Certain materials may be furnished, installed, or furnished and installed, by others. Examine the Contract Documents to ascertain these requirements.

In relation to such works this contractor shall:-

- A. Carefully check space requirements with other trades to ensure that all material can be installed in the spaces allotted thereto. Finished suspended ceiling elevations are indicated on the general construction drawings.
- B. Caution workers both verbally and in writing as to the dangers involved in doing work within or adjacent to electric closets, plant rooms and Switchboard Rooms, due to the dangers caused by presence of high voltage and currents in these spaces and operate a permit to work system as necessary.
- C. Provide required supports and hangers for the distributed services and equipment, so that loading will not exceed allowable loadings of structure while retaining the frequency of supports as dictated by this Specification. Submittal of a bid shall be deemed a representation that submitting such bid has ascertained allowable loadings and has included in estimates the costs associated in furnishing required supports.
- D. Be responsible for scheduling this work with other trades in accordance with the construction sequence.
- E. Coordinate with others field drilling, cutting and/or reinforcing of holes in structural slab required for work under this specification and obtain approval from Structural Engineer. Allow for all costs for all such drilling, cutting and reinforcing costs.
- F. Install the engineering services in accordance with the requirements for ceiling heights and fully co-ordinate with all other trades.
- G. Take responsibility to co-ordinate the supply, installation, commissioning, testing and programming of all the works described in the contract documents, whether it is supplied or modified under these Works or is a free issue for installation.
- H. Accept responsibility for co-ordination and liaison with others to ensure that the installation as detailed does not conflict with other services or the building fabric, either during the construction or within the finished building.
- I. Ensure that co-ordination with all related elements of work has been fully coordinated and planned prior to submitting information for acceptance or commencing the installation. No instructions will be issued in respect to additional cost due to modifications not being so co-ordinated.

- J. Allow for the positioning, routing and/or locating of any service run or equipment to be adjusted from the positions shown on the Tender drawings, during the production of co-ordinated Installation (Shop) Drawings.
- K. Take site dimensions during the preparation of the Installation (Shop) Drawings and be responsible for their accuracy.

1.19 Technical Submittals

The requirements in relation to technical submittals shall be as follows:-

- A. Submit to the Building Services Engineer for acceptance detailed Builders work Drawings, Installation Drawings, Co-ordinated Shop Drawings, technical literature and samples for the installation and equipment described herein.
- B. Produce Builders work Drawings showing all bases, holes, openings, chases and other builders work requirements associated with the package of works specified herein.
- C. Confirm any preliminary builders work and structural information, already provided by the Building Services Engineer, and incorporate into Builders work Drawings.
- D. Fully detail and dimension Builders work Drawings and be solely responsible for their accuracy.
- E. Fully co-ordinate the drawings with all other services and the structure. Work in conjunction with other trades to ensure that the drawings are fully co-ordinated.
- F. Submit detailed Installation (Shop) Drawings and Builders Work Drawings for all areas and elements of the installation including plant rooms, showing equipment layouts, cores and risers. Provide the drawings at a scale sufficient to fully inform the Building Services Engineer of all installation details with general arrangement layout drawings at a scale not less than 1:50 with plant rooms, risers, details and sections at 1:20 scale.
- G. Show in layout and detail pads, foundations, anchorages, supports and attachments to the building structure where required for the installation of the work with dimensions, materials and method of construction noted.
- H. Check Shop Drawings and samples for accuracy, completeness of required information and conformance with the contract documents. Be responsible for Shop Drawings found to be inaccurate, incomplete or not in conformance with the contract documents before submitting for review.
- I. Ensure shop drawings for manufactured material and equipment includes model numbers, dimensioned drawings, operating weights, material specifications, operating features and controls, wiring diagrams, performance characteristics, service procedures, including clearance requirements for maintenance work, and conformance to specified codes and standards. Note that in addition to these requirements, other specific submittal data, and forms of data submission, are required by the Contract Documents for particular items of equipment and material.
- J. Submit names, sizes, catalogue numbers and samples of equipment for acceptance as detailed elsewhere in this document.
- K. Ensure that for each submittal there is clearly indicated the Contract Drawing Number or Specification Section used as reference.
- L. Ensure samples are identical in all respects to the material which is to be installed or applied in the execution of the work, and of sufficient size or quantity to permit proper evaluation and review. Furnish with the material, manufacturer's descriptive labels and printed application

instructions which are normally attached to the material or its packaging. Submit samples for acceptance when requested by the Building Services Engineers.

- M. All drawings and technical literature submitted for acceptance shall receive a Building Services Engineers review stamp indicating A, B or C action as defined below:

“A - Accepted”

Action means that fabrication, manufacture or construction MAY proceed providing the submittal complies with the Contract Documents.

“B1 - Accepted”

Action means that fabrication, manufacture or construction MAY proceed providing the submittal complies with the Building Services Engineer notations, comments, changes or alterations made and the Contract Documents. The submittal shall be resubmitted incorporating all comments made by the Building Services Engineer.

“B2 - Resubmit”

Action means fabrication, manufacture or construction MAY proceed with only the portion of the drawings not affected by the Building Services Engineer comments. The remainder of the drawing shall be revised incorporating the comments and resubmitted prior to fabrication, manufacture or construction.

“C - Rejected”

Action means that the submittal DOES NOT comply with the Contract Documents and that fabrication, manufacture or construction SHALL NOT proceed. Submittals stamped in this manner are not permitted on the job site.

Works fabricated/installed prior to completion of this process is performed at contractors own risk.

- N. Ensure that all drawings used by site personnel for the installation of equipment bear the Building Services Engineers' review stamp indicating the acceptance status.
- O. Be responsible for materials installed or work performed without acceptance of material samples and/or shop drawings. Accept the cost of removal of such material or work which is judged unsatisfactory for any reason.
- P. Acceptance by the Building Services Engineer of drawings, technical literature and other submittals relates to conformance with the design intent only and is not a release of responsibility for detailed compliance with the specification, design drawings and Contract Documents.
- Q. Upon appointment issue a detailed programme for submittals agreed with the Building Services Engineer.

10 working days shall be allowed for the review and acceptance of each submittal.

- R. Properly reference each submittal with the project name, submittal contents and a unique number.
- S. Submit for review a list of the special tools, lubricants, and recommended spare parts to be supplied in the service kits.

1.20 Factory Acceptance Testing

The Building Services Engineer requires that all plant be factory tested and precommissioned prior to delivery to site. The contractor shall give five working days notice of proposed factory

testing and pre commissioning and shall afford the Engineer the opportunity to witness such tests at the factory.

The contractor shall submit factory test method statements for approval prior to factory acceptance testing visits.

1.21 Operation of Plant Prior To Practical Completion

The contractor shall ensure systems are not, without the prior written approval of the Building Services Engineer used or set into operation before Practical Completion.

Systems to be used before practical completion for the benefit of these works must have all defective consumable elements (including lamps and tubes) replaced by new not more than seven days prior to Practical Completion.

No system shall be put into use prior to handover to the Client, except for testing and commissioning, unless in accordance with the following procedure:

- 1) Following the receipt of written instructions, operate designated parts of these works, provided that such operation is practicable and does not prejudice your responsibilities and obligations as specified herein.
- 2) Additionally and with adjustment to the works sum, if instructed, provide:
 - a) Comprehensive insurance including indirect loss for any plant being operated
 - b) Maintenance of the installation
 - c) Re-instatement of the installation to “as new” condition prior to handover to the Client
 - d) Allow the defects liability to commence at handover

1.22 Cleaning Upon Completion

At completion the contractor shall carry out a thorough clean-down of all the installations using a specialist contract cleaning company. Such cleaning shall only commence when all works are completed and when authorised by the employers representative.

1.23 Operating and Maintenance Manuals

The contractor shall provide two hardcopy copies and two disks of all operating and maintenance manuals and as installed drawings for the works. Drawings shall be provided in the latest revision of AutoCAD and also in PDF format.

The contractor shall agree the format and contents of the handover manual with the Building Services Engineer. The operating and maintenance manuals shall include, but are not limited to the following:

1. Index of Contents
2. Contact details for the contractor and all equipment suppliers and involved parties.
3. A full description of each of the systems installed, written to ensure that the Client's staff fully understand the scope and facilities provided. Description to include data on general design parameters, normal associated operating conditions and manufacturer's information concerning correct operation, etc, based on commissioning results.
4. A description of the mode of operation of all systems.
5. Diagrammatic drawings to each system indicating principal items of plant, equipment, valves, etc.
6. A photo-reduction of all record drawings, together with an index. In A4 / A3
7. Legend for all colour-coded services.

8. Schedules (system by system) of plant, equipment, valves, etc, stating their locations within the building, duties and performance figures. Ensure each item has a unique code number cross-referenced to the record and diagrammatic drawings and schedules.
9. The name, address and telephone number of the manufacturer of every item of plant and equipment together with catalogue list and order acknowledgement numbers.
10. Manufacturer's technical literature for all items of plant and equipment, assembled specifically for the project, excluding irrelevant matter and including detailed drawings, electrical circuit details and operating and maintenance instructions.
11. A copy of all Test Certificates, Inspection and Test Records, Commissioning and Performance Test Records (including, but not limited to, electrical circuit tests, corrosion tests, type tests, start and commissioning tests) for the installations and plant, equipment, valves, etc, used in the installations.
12. A copy of all manufacturers' guarantees or warranties.
13. Copies of Insurance and Inspecting Authority Certificates and Reports.
14. Starting up, operating and shutting down instructions for all equipment and systems installed.
15. Details of procedures to maintain plant in safe working conditions.
16. Control sequences for all systems installed.
17. Schedule of all fixed and variable equipment settings established during commissioning.
18. Back-up copies of any system software.
19. Documentation of the procedures for updating and/or modifying software operating systems and control programs.
20. Instructions for the creation of control procedure routines and graphic diagrams.
21. Details of the software revision for all programs provided.
22. Two back-up copies of all software items, as commissioned.
23. Details of regular tests to be carried out (e.g., water cooling towers, etc).
24. Copies of relevant HSE/CIBSE/IEE/ETCI etc Guidance notes, etc.
25. Procedures for seasonal change-over and/or precautions necessary for the care of apparatus subject to seasonal disuse.
26. Recommendations for the preventative maintenance frequency and procedures which should be adopted by the Client to ensure the most efficient operation of the systems.
27. Details of lubrication systems and lubrication schedules for all lubricated items.
28. A list of normal consumable items.
29. A list of recommended spares to be kept in stock by the Client, being those items subject to wear or deterioration and which may involve the Client in extended deliveries when replacements are required at some future date.
30. A list of any special tools needed for maintenance cross referenced to the particular item for which required.
31. Procedures for fault finding.
32. Emergency procedures, including telephone numbers for emergency services.
33. Copies of all items incorporated in the plant room and switch room schedules and schematics.

The contractor shall provide the Manuals in A4 size, plastic-covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover-titled. Fold drawings larger than A4 and include in the binder so that they may be unfolded without being detached from the rings.

The contractor shall provide record drawings and include for the provision of relevant framed plasticized drawings in all electrical rooms.

Two copies of all record drawings, in print form, are required to be handed to the PSDP before completion of the project. They shall have been previously submitted to the Building Services Engineer for comment. The PSDP also requires 2 copies of all record drawings to be made available on disk. All record drawings are to be prepared on AutoCAD and shall also be provided in PDF format.

1.24 Site Modifications

The contractor shall not make site modifications to assemblies without authorisation from the Building Services Engineer.

Where site modifications to assemblies are authorised make in accordance with manufacturer's certified drawings and instructions. Ensure that modifications made comply with any type test certificate obtained for arrangement of components.

1.25 Operational Demonstrations

The contractor shall provide a written statement to the Building Services Engineer confirming that each installation has been correctly tested and commissioned and that the performance requirements can be achieved.

The contractor shall demonstrate to the Building Services Engineer that all system components are operating correctly, and the completely integrated installation will function in accordance with the specified performance requirements. Allow for a 1 week environmental test period for this demonstration.

1. Run each plant for 1 week.
2. Provide a log book and record all hours run.
3. Where required provide equipment to simulate loads on-site.
4. Where required, allow for "Doomsday" testing of Mechanical, Electrical and Systems to observe correct operation of building under failure of the normal power.
5. Where required, allow for the full testing of the air conditioning system(s).

Any items, which have failed their acceptance tests shall not be accepted by the employer and shall be replaced by the contractor at contractor expense.

1.26 Loose Tools and Lubricants

The contractor shall provide special loose tools recommended by plant and equipment manufacturers for the satisfactory maintenance of their machinery to the Client at the completion of the works.

The contractor shall identify and all such tools and provide a suitable galvanised/lockable steel box for storage

The contractor shall provide lubricants for all moving plant and equipment as recommended by the manufacturers.

1.27 Defects Liability Period

The contractor shall be responsible for making good any defect in or damage to any portion of the works which may develop during a period of twelve months after practical completion and which arise either from defective materials or workmanship or from any act or omission.

During the defects liability period the contractor shall be responsible for all routine and preventative maintenance as required / recommended by the equipment manufacturers.

1.28 Site Survey

The tenderer shall have visited and checked the site relative to all aspects of the work and include for same in his tender. No claims whatsoever will be entertained by the engineer due to the lack of knowledge of site conditions or existing installations.

2.0 SUMMARY DESCRIPTION OF THE WORKS

The following is a summary of the works proposed. Refer to the relevant sections of this specification, and the associated drawings for full details. **The contractor shall price for ALL items of plant and materials and associated builders work to provide a complete fully functional installation whether specifically mentioned or not.**

2.1 General

The scope of work for the electrical sub-contract on this project involves the complete electrical installations for the Classroom Extensions and Woodwork Room Alteration at CBS Thurles Secondary School, Rossa Street, Thurles, Co. Tipperary as specified herein and as indicated on the drawings.

2.2 Standards

The electrical services shall be installed in accordance with current editions of the ETCI National Rules for Electrical Installations, Department of Education Technical Guidance Documents TGD 003, TGD 005, TGD 031, TGD 032 and TGD 033, Building Regulations, relevant Irish Standard Specifications, EU Standards and Directives and the recommendations of the Chartered Institution of Building Services Engineers, which are, in the Engineer's opinion, applicable.

2.3 Summary Scope of Work

The electrical services required for the Classroom Extensions and Woodwork Room Alterations project are summarised as follows:-

- a) Power Supply & Distribution Systems
- b) General Service & Equipment Power Systems
- c) Mechanical Equipment Power & Controls
- d) General & Emergency Lighting Systems
- e) Information Communications Technology (ICT) Systems
- f) Public Address & Class Change System
- g) Fire Detection and Alarm System
- h) Intruder Alarm System
- i) CCTV Camera Relocations
- j) Builder's Works Setting Out & Supervision
- k) Maintenance for year 1 (during defects liability period)

2.3.1 Demolitions Site Temporaries

The electrical contract shall include for tracing, isolation and disconnection of existing electrical installations as required to enable the main contractor complete necessary demolitions which are required to facilitate the proposed classroom extensions and woodwork room alterations. Existing electrical fittings and equipment including external light fittings, CCTV cameras, intruder alarm, socket outlets etc shall be carefully removed, salvaged and placed in secure storage for later relocation and reinstallation in the extension as detailed on the drawings.

Provision of temporary power supplies for the works shall form part of the main contractors Preliminaries for the project. Temporary power supplies shall be installed as required and shall be maintained for the duration of the works by the electrical sub-contractor (as part of overall preliminaries). Site temporaries power supply connection shall be taken from the existing school electrical supply via check meter at an agreed point to be confirmed with the Services Engineers.

2.3.2 Power Supply & Distribution

The School is currently provided with a three phase 230/400 Volt supply connected to ESB Network.

The existing 400/230V Sub Distribution Switchboard located in the Woodwork Room is to be extended / upgraded as required to supply power to the new services as shown on the drawing / schedules.

A new Sub Distribution Switchboard, SDB-1 shall be located in the general office of the 2 Classroom extension as shown on the drawing to serve the extension. Sub main power distribution shall be via a 5x16mm² XLPE/SWA/PVC cable fed from the existing Main Distribution Board. Final MCB Board Schedules shall be as Appendix B of this document.

Sub-Main Power cables shall be multicore stranded copper conductor XLPE insulated, Steel Wire Armoured with LSF oversheath run on medium duty galvanised steel cable tray. All sub-main cables shall terminate in a suitably rated main isolator.

2.3.3 General Service & Equipment Power

General service and equipment 230 Volt power outlets shall be installed through-out the extensions as specified herein and as shown on the drawings. In the upgraded Woodwork room provision of 110 Volt power outlets shall be installed as specified herein and as shown on the drawings and shall be fed from the existing SDB-110V.

Power circuits shall be wired using stranded copper conductors with LSF insulation run in a galvanised steel conduit and trunking system. Cable size for socket circuits shall be 4 mm sq. generally.

Outlets shall be surface plates of metal clad finish only and be engineered to fit flush with the back box which shall be knockout free as particularly specified on the drawing and accessories schedule. Main containment shall be run within the ceiling voids and conduit drops shall be generally exposed/surface run and shall be painted in to match room finishes by the Main Contractor.

2.3.4 Mechanical Equipment Power & Controls

The electrical contractor shall supply, install and test the power and control cabling to all mechanical equipment. Mechanical equipment power and control cabling shall be as particularly shown on the drawings and shall be run on medium duty galvanised steel cable tray or in a conduit and trunking system as appropriate.

The electrical contractor shall include for an industrial type local isolator for each item of mechanical equipment. Local isolators shall have facility for padlocking in the off position, and shall be positioned immediately adjacent to the respective mechanical equipment in accordance with ETCI regulations. Final connections shall be in heat resistant flex.

All room sensors / controls / motorised valves etc shall be supplied by the mechanical contractor and erected by the electrical contractor who shall provide attendance on the mechanical/controls contractors as necessary to ensure successful testing and commissioning of the mechanical equipment and controls systems.

2.3.5 General & Emergency Lighting

The contract includes for both the modification of existing systems and for the supply and install of the new lighting and emergency lighting systems to the upgraded and extended spaces as detailed on the drawings. New internal lighting shall be energy efficient types with automatic smart controls as particularly specified.

New external lighting shall be provided comprising of vandal resistant bulkhead luminaires to IP65 mounted on the building with connection to existing automatic controls.

The emergency lighting system shall comply in all respects with Irish Standard IS 3217, 2013.

The existing external site lighting installation shall be relocated and retained in service and existing underground cabling shall be diverted / jointed / protected to allow safe construction of the new extensions while retaining the remainder of the existing site lighting in service following satisfactory testing by this contractor.

2.3.6 Information Communications Technology (ICT) Systems

The extensions shall be fitted with a structured wiring system for data and voice networks which is to be an extension of the existing ICT Systems at the school as detailed herein and as shown on the drawings.

2.3.7 Public Address & Class Change System

The extension shall be fitted out with a public address system and class change which shall be an extension of the existing school system. The existing PA Amplifiers shall be extended/ upgraded as required to serve the additional speaker loads.

2.3.8 Fire Detection and Alarm System

The extension shall be provided with an open protocol Addressable Fire Detection and Alarm system, Type L3 which shall be an extension of the existing C-Tec addressable system. The extended fire alarm system shall comply with the requirements of IS 3218 2013.

2.3.9 Intruder Alarm System

The existing school intruder alarm system is to be upgraded and extended as required to provide full intruder alarm coverage to the extended spaces as detailed herein and on the drawings. The system shall comprise of magnetic contacts on the new entry / fire exit doors and dual technology passive infrared motion detectors in all classrooms office and circulation areas.

2.3.10 CCTV Camera Relocations

Two existing CCTV Cameras shall be relocated to provide CCTV coverage to the new extension areas as detailed on the drawings. The relocated CCTV systems shall be tested and re-commissioned under the electrical sub-contract using the schools existing CCTV specialist.

2.3.11 Builder's Works

The Contract includes for all necessary builders' works as required to complete the electrical services installations. Builders works shall be set out and supervised by the electrical sub-contractor and completed by the main contractor.

2.3.12 Maintenance

The Contractor shall include for full routine and preventative maintenance of the new Classroom Extensions and Woodwork Rooms upgrade Electrical Installations, supplied under the contract, for a period of 12 months from date of final hand over to the Client. Such maintenance shall include all specialist sub systems including fire alarm, intruder alarm, and CCTV and ICT etc, and charges for the specialists standard maintenance agreement for year 1 shall be included in the tender.

3.0 LOW VOLTAGE POWER DISTRIBUTION SYSTEMS

3.1 Electricity Supply

The School is currently provided with a three phase, 230/400 Volt supply connection from the local ESB Network.

The existing Main Distribution Switchboard is located in a closet off the main corridor. The main switchboard shall be extended / upgraded to provide a new 63 Amp Three Phase Neutral and Earth Feeder to supply power to the new 2 Classrooms and Office Extension as shown on the drawing / schedules.

A new Sub Distribution Switchboard SDB-1 shall be located in the office of the new extension as shown on the drawing to serve the new rooms. Final MCB Board Schedules are included as Appendix B of this document.

Sub-Main Power cables shall be multicore stranded copper conductor XLPE insulated, Steel Wire Armoured with LSF oversheath run on medium duty galvanised steel cable tray as shown on the drawings. All sub-main cables shall terminate in a suitably rated main isolator.

The contractor shall note that the arrangement of temporary electrical supply for the works is a matter for the main contractor to arrange under his preliminaries for the project. The school's existing power supply is available to the contractor for connection of the necessary site temporaries. The contractor shall install a check meter and the contractor shall be liable for the cost of electricity used during the contract which shall be deducted from the final account based on actual usage as recorded by the check meter.

3.2 Existing Main LV Switchboard

The Contractor shall extend the existing Main Distribution Switchboard to provide a new 63 Amp three phase neutral and earth feeder to the new Classrooms and Office Extension.

Note the existing switchboard must be isolated and earthed to carry out such upgrade works and any shut down works shall be by prior arrangement only with the project manager / school authority, and shall be scheduled outside of normal school hours. **No Live line works shall be permitted.**

The new feeder circuit shall be wired to terminals suitable for top exit.

Settings for the new MCCB feeder shall be agreed with the Services Engineer prior to energising the switchgear.

Earthing of LV Switchgear shall be in accordance with ETCI regulations, ESB specifications and LV switchgear manufacturer's recommendations.

3.3 Classroom & Office Sub-Distribution Board

A new Sub-Distribution Board SDB-1 (MCB Board) shall be provided to serve the Two Classrooms and Office extension. It shall be to Form 2, MCB type board with din rail mounted components wired to terminals suitable for top entry. Fuse type boards shall not be used.

MCB boards shall be suitably sized to house protection and control equipment for feeding their intended services, in addition, MCB board shall be fitted with 25% spare ways fitted as indicated on the MCB Board Schedules. In addition a further 25% spare space will be provided unfitted, for future fit out with components.

Combined MCB's/RCD's shall be din rail mounted, of the electronic type incorporating 30mA tripping unit. Where combined MCB's/RCD's are used to protect computer, server or sensitive equipment Si type RCD's shall be used to avoid nuisance tripping.

MCB boards shall be suitable for floor or wall mounting and shall be arranged for top cable entry and exit. MCB boards shall be vermin proof and shall have lockable metal doors. A PVC type pocket shall be installed on the inside of the door of each MCB board. This shall hold a laminated schedule of the circuits in the board.

Outgoing cables shall be terminated in a separate terminal section of the MCB board and shall be arranged in a neat and orderly fashion. All incoming and outgoing cable tails shall be labeled using PVC cable tags. (referencing to be agreed with the client's representative prior to labeling).

All MCB Boards shall have a suitable rated, internal main switch disconnecter. Lighting and General Services MCB boards shall be segregated, including physical separation of each section of lighting control equipment, signage, emergency lighting, general and emergency lighting contactors, etc.

Lighting and general purpose power sections shall each have a suitably rated MCCB to facilitate individual isolation of each section as detailed on the single line diagram. This is in addition to the MCB Board Main switch disconnecter. An additional, manufacturer's proprietary vertical cable duct, shall be provided to each MCB board to facilitate an easy and organized cabling installation.

The Contractor shall ensure that all MCB boards physically fit in their intended location, including any requirements for their proposed future extension outlined. All MCB boards shall, as a minimum, have 1.2 metre clear and unimpeded space in front for maintenance etc.

MCB Boards shall be located as indicated on layout drawings. MCB Board requirements shall be as scheduled – refer to Appendix B

3.4 Small Power Systems

The Contractor shall supply, install, set to work and commission a complete fully functional small power system to the Classroom extensions and Woodwork Room alterations as described in the specifications and as indicated on the layout drawings.

The system shall include but is not limited to the following:-

- DADO trunking (horizontal and vertical) for small power distribution in classrooms and office
- General service socket outlets 230V and 110V
- Cleaners socket outlets
- Power supplies to Fire Alarm, Security, CCTV and Ancillary systems.

The Contractor shall liaise with specialist vendors to determine their exact requirements for power supplies, claims for variations due to this exercise not being carried out will not be entertained.

The Contractor shall confirm all accessory types and finishes with the Engineer prior to ordering of equipment.

The small power installation shall be wired using LSF single core copper cables run in a galvanised steel conduit and trunking system. The majority of the installation is a surface type run on fair faced concrete blockwork. Main trunking runs shall be concealed above ceiling level and shall be mounted well clear of attic insulation.

Note: Conduits are not shown on the drawings. It is the contractor's responsibility to allow sufficient conduits to complete the works.

In general, the maximum number of sockets per circuit shall be limited to 6 No. twin sockets per circuit.

Each socket circuit shall be run in 4mm sq. cable protected by an individual 30mA/RCD/MCB combination unit suitably rated. A single overall RCD device shall not be acceptable due to potential for nuisance tripping.

All general sockets to be of the switched type with no indicator lamps, unless specified otherwise.

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

The Contractor shall supply and install all supports, brackets, fixings and electrical identifications.

The Contractor shall include in the tender for inspection, testing, certifying and commissioning of the complete installation and for demonstration of the tests to the Engineer and / or client representative.

The Contractor shall include for all other items not described in this scope which are necessary to provide a fully working certified system in accordance with the current ETCI National Rules for Electrical Installations.

3.5 Labelling

The Building Sub Distribution MCB boards shall be labelled using traffolyte type labels with 40mm black lettering on white background. Each board shall be labelled externally indicating Contractor name and contact details.

Exact labelling requirement shall be agreed with the client's representative prior to board construction.

3.6 Earthing and Bonding

The Contractor shall include for earthing and bonding of full installation to ETCI standards. Separate protective earth wires are to be run for all final sub-circuits including lighting.

Testing and inspection shall be carried out in accordance with Section 6 of the regulations.

All earthing conductors shall be single core stranded copper with a green / yellow LSF insulating outer sheath, sized in accordance with the ETCI regulations.

Earthing connections to all equipment shall be in strict accordance with the manufacturer's recommendations.

3.7 Testing and Commissioning

Test and commission full installation to ETCI Regulations. The Contractor shall provide completed test reports as outlined in E.T.C.I. Part 6 "Verification and Certification" prior to handover.

4.0 LIGHTING & EMERGENCY LIGHTING SYSTEMS

4.1 Lighting System

The Contractor shall supply and install all general luminaires. The contractor shall include for all lamps, fixings, mounting brackets and accessories associated with the luminaires to provide fully operational lighting systems.

Luminaires shall be installed generally as indicated on the drawings, however final setting out shall be agreed on site and will work to site dimensions only.

General light fittings to the new and extended classrooms and office shall be energy efficient 2 x 49 watt T5 linear fluorescent type with dimmable high frequency gear, and smart controller complete with lamps, diffusers etc as particularly specified on the drawing / luminaire schedule.

Lights in the circulation corridors shall be linear fluorescents with energy efficient T5 lamps and prismatic diffusers as particularly specified on the drawings. Lights in these spaces shall be controlled by master on/off switch with 'smart' passive infrared absence detection within each space.

The Contractor shall, when installing luminaires with polished reflectors or louvres, wear cotton gloves to protect the finish on the luminaire and prevent degradation of performance due to finger marks/prints.

Lighting circuits shall be LSF wiring run in a galvanised steel conduit and trunking system. Cable size shall be 2.5mm sq. generally. Conduit drops shall be generally exposed/surface run on fair faced concrete blockwork and shall be painted in to match existing room finishes. Surface mounted switches shall be as MK Metalclad Plus or equal and pre approved and shall have knock out free back boxes.

Final connection to light fittings shall be by means of kilik boxes or ceiling roses. The Contractor shall ensure that all Klik boxes and ceiling roses are located such that they are accessible for future maintenance.

The new external lighting system shall comprise of vandal resistant bulkhead luminaires to IP65 mounted on the building. External lighting shall be contactor switched with control via central photocell, with time clock, and a master manual override located in the general office as particularly specified on the drawing.

Existing lighting shall be retained in the Technology and Science Rooms as shown on the drawing. The Contractor shall make allowance for replacement of any defective lamps and or fittings of the existing system where necessary. Replacement of such items shall be confirmed with the Building Services Engineer.

4.2 Luminaire and Lamp Schedules

The Schedule of all luminaires including the emergency luminaires and the external luminaires is contained on the drawing. In general all new luminaries shall be energy efficient types with high frequency gear. Luminaires in teaching rooms / office spaces shall have dimmable gear to facilitate daylight savings.

The Contractor shall ensure that all the luminaires required for the project are placed on order at due time to ensure delivery to suit the project programme. However, approval of the Engineer shall be obtained for final selection of the luminaires before the orders are placed.

No substitutions or alternative luminaires will be considered unless the Contractor is able to demonstrate that the performances and effects created by such substitution are in no way different from those achieved from luminaires specified.

4.3 Luminaires

Luminaires shall be supplied complete with Louvres, diffusers, lampshades, transformers, lamps, mounting brackets and accessories as required. Liaise with the main contractor / ceiling sub contractor on mounting details.

Under no circumstances will single core cables be permitted to enter any of the luminaires. These cables shall be terminated in plug-in ceiling roses and klik boxes. High-temperature 3 core, EPR/PVC, flexible lead and plugtop shall be supplied by the Contractor for final connection to the fittings. Leads shall be a maximum of 1.5m in length.

The circuiting of luminaires as shown on the drawings is indicative of the circuiting required. Contractor shall prepare circuit proposals for approval by the client's representative prior to commencement of wiring. For internal circuits Max. 10 luminaires or 1.0kw max. fluorescent/discharge load.

Circuit references and arrangements shall be agreed with engineer prior to commencing work on site. The circuit layout and circuit loading shall be such that equal load and balancing of the phases shall be adhered to by the Contractor throughout the distribution system.

4.4 Spare Lamps

The Contractor shall supply 10% of each lamp type rounded up to nearest standard pack, as spares on the date that Practical Completion for the project is attained. All failures of lamps during the defects liability period shall be rectified by the contractor at contractor expense and shall not be considered a consumable.

4.5 Lighting Controls

Light switches shall be surface 10A plate-switch type mounted on knock out free back boxes as detailed and ganged on the drawings in all areas. Switches shall be MK Metalclad Plus or equal to prior approval.

'Smart' system absence & daylight detectors shall be supplied and installed on each fitting as shown on drawings to automatically control local lighting circuits.

In classrooms and teaching spaces automatic lighting controls shall be based on manual on / off switching, absence detection and daylight sensing, so that lights will need to be switched on manually and will dim/ turn off automatically depending on the signals from the automatic controls. The light fittings close to the Interactive White Boards (IWB) will be switched separately to aid visibility of white board presentations.

4.6 Emergency Lighting

An emergency lighting scheme shall be installed as specified herein and as shown on the drawings. The emergency lighting system will comprise of stand alone emergency fittings to provide 3 hours emergency back-up lighting as particularly specified on the drawings.

Escape lighting shall comprise of maintained exit signs with integral 3 hour battery and charger units located on escape routes as detailed on the drawings. All emergency and escape lighting circuits shall be connected via a central test unit to allow periodic testing.

The Contractor shall supply and install an emergency lighting Central Test Unit (CTU) with 30 min. and 3 hr. test periods in the Sub Distribution Board SDB-01.

Emergency luminaires shall be as the original manufacturer's standard factory fitted conversion, **third party conversions shall not be accepted.**

Charger LEDs must be clearly visible on the exposed portion of any emergency luminaire and located in a manner that will not interfere with the operation or maintenance of the luminaire or be liable to damage or concealment within the luminaire.

The Contractor shall include for all emergency lighting system commissioning costs.

The emergency lighting system shall comply in all respects with Irish Standard IS 3217, 2013.

4.7 External Lighting

The Electrical Contractor shall include for the modification of the external lighting systems as detailed on the drawings.

The relocated and new external lighting shall be connected to the existing controls which include time clock and photocell with manual override.

4.8 Testing and Commissioning

The installation shall be fully tested and commissioned by the Contractor. Include for specialist Testing and Commissioning of the emergency lighting system and the automatic presence/daylight controls.

The Contractor shall perform a 3 hour duration test on the emergency luminaires and provide the Client's representative with at least 5 working days notice of this test.

A test/commissioning certificate in the format of the IS 3217 2013 Model Form, must be submitted to the Client's representative.

5.0 INFORMATION SYSTEMS

The existing main School Information Communications Technology (ICT) systems are to be extended to serve the new classrooms & office and upgraded existing classrooms. The Contractor shall take all necessary steps to protect existing installations during the course of the works and any interface connections shall be completed only with prior agreement of the school authority.

5.1 ICT Structured Cabling System

The extensions shall be fitted with a structured wiring system for data and voice networks as specified herein and as shown on the drawings. The structured cabling system shall comprise of CAT 6, 4 pair UTP cable, RJ45 outlets, patch panels, active switches, hub unit, and patch leads all of which will be supplied and installed by an ICT specialist under this electrical Contract.

The CAT 6 cabling shall be run in a galvanised steel tray/basket and conduit system which shall be supplied and installed under this contract. CAT6 cabling shall terminate in CAT 6 RJ45 outlets.

The new structured wiring system shall connect to the nearest available ICT Comms Cabinet.

A quantity of patch leads, both 1m and 3m as scheduled in the pricing document shall be included in the tender.

One 24 port active switch and a wireless access hub shall be provided in order to provide a fully functional ICT system. The wireless access hub shall match the schools existing Wi-Fi system.

All new CAT6 field data wiring shall be supplied and installed by qualified data technicians and shall be provided with a minimum of 15 year system warranty.

The electrical contractor shall allow for attendance on and liaison with the specialist ICT contractor to deliver a working ICT installation.

5.2 Testing and Commissioning

The contractor shall allow for, and arrange, attendances on all ICT specialist suppliers for final connections, testing and certification.

Circuit runs should be tested by the contractor for short and open circuit using standard test metering equipment, before final testing and connection by the specialist ICT system suppliers. All tests must be recorded in the specified format.

Commissioning and test certificates for the data installation carried out under specialist sub-contract should be retained by the contractor for inclusion with the record documents for the project.

6.0 PUBLIC ADDRESS

The Contractor shall modify/extend and upgrade the existing Public Address and Class Change System to cater for the new extensions as detailed herein and on the drawings. The system shall be an extension of the existing school system which is located in the administration office. The existing PA Amplifiers shall be upgraded as required to serve the additional speaker loads.

The system shall be a one way public address system and shall be installed with speakers in all new teaching spaces and circulation areas of the new classroom extensions.

The system upgrade shall consist of the following:-

- Upgrade / extension of the existing Desk mounted console, containing amplifier and room selector switches. Additional switches to be added to cater for the new classrooms
- Wall mounted speakers as indicated on the drawings
- Upgrade of existing automatic class call system to include the additional classrooms

The existing Public Address Control unit located in the Administration Office shall be retained and upgraded as required to cater for the new classroom extensions requirements.

The classroom speakers shall be positioned on the corridor wall adjacent to the teacher's desk 2.4 m above the finished floor level

Where exposed, wiring will be drawn into galvanised steel conduit. In ceiling spaces etc., wiring shall be installed on the ELV cable carriers provided for elsewhere in this document. Cables shall be run to the Administration office of the main school via underground duct to the main corridor of the existing school rising to the corridor ceiling voids where they shall be fixed on existing cable trays where feasible.

Conduit drops to items or equipment and devices will be exposed / surface run throughout. Exposed conduit shall be painted in to match wall finishes.

Wiring for Public Address speakers shall be carried out in minimum 1.5 sq.mm LSF insulated cables drawn into galvanised steel conduits throughout.

6.1 Testing and Commissioning

Commissioning certificates must be fully completed by both the systems and wiring contractors before Practical Completion will be awarded.

6.2 Client Staff Instruction - Manuals and Drawings

The users shall be instructed in the operation of the system at Practical Completion or shortly thereafter. At this time, a commissioning certificate and as-installed drawings and an operations manual must be handed over.

Two further copies of the above must also be included in the O. & M. manuals.

Allow for a subsequent instruction session with the Client representative when the facility is operational.

7.0 FIRE PROTECTION SYSTEMS

7.1 Fire Detection and Alarm System

The new classroom extensions and Woodwork Room alterations shall be fitted with an addressable fire detection and alarm system which shall be an extension of the existing CTEC analogue addressable system in the main school to provide coverage to the extension area as detailed herein and on the drawings.

The Contractor shall supply, install, set to work and commission the complete new fire detection and alarm system in the extension areas in strict accordance with the requirements of IS 3218:2013.

The system shall be type L3 installed as detailed on the layout drawings.

The fire alarm system shall be an open protocol system as C-TEC XFP and detectors / devices shall be as Apollo to match existing or equal and pre approved.

The fire alarm shall be as supplied by Hall Alarms, Clonmel, Tel 0526121944, email info@hallalarms.com or equal and pre-approved supplier.

The existing main control panel located in the main entrance lobby of the existing school shall be upgraded as required to support communications with the detection equipment.

Activation of the system shall cause:

- Fire Alarm Sounders in the building to operate
- Activation of digi-dialler in Intruder alarm system.
- Fire Alarm to be raised in remote monitoring centre.
- Shut down of Boiler Control Panel
- Release of the access controlled doors

The system supplier shall include for the following:

- a) Testing, re-commissioning and re-certification to IS 3218, of the complete installation. Final testing must be in accordance with the project programme and issue of certification must be within 24 hours of final testing / commissioning.
- b) A framed, updated zone chart located adjacent to the Fire Alarm Panel
- c) Update of the 2 No framed zone charts located adjacent to the Main and Repeater Panels in the main school building to include the new extension areas.
- d) Allow for 2 No. visits to site to instruct the end user on the system operation and maintenance requirements in accordance with IS3218.

The complete fire alarm system, including interfaces shall be wired in 2x1.5mmsq. Pirelli FP200 Gold cable secured at 250mm centres by means of fire rated clips.

Fire alarm system cabling drops to devices shall be surface mounted contained within galvanised steel conduit in all areas.

Manual call points shall be re-settable key operated type, complete with hinged plastic cover to protect against accidental operation. All cable drops shall be enclosed within galvanised steel conduit.

The Contractor shall provide trunking headers as required for cable entry to control panels.

7.2 Testing and Commissioning

Commissioning certificates in the form of the IS3218 2013 Model Form part 2 and 3 must be fully completed by both the systems and installation contractors prior to handover. The specialist system supplier's commissioning engineer shall fully instruct the user's representative(s) in the system in accordance with the requirements of IS3218 and shall arrange for completion and sign off of Part 4 of the model form certificate by the user before Practical Completion will be awarded.

The contractor shall perform audibility tests as part of the commissioning of the system and present the results to the Engineers in tabular format.

7.3 Client Staff Instruction - Manuals and Drawings

The users shall be instructed in the operation of the system at Practical Completion or shortly thereafter. At this time, a commissioning certificate, user logbook, zone chart, as-installed drawings and an operations manual must be handed over.

Two further copies of the above must also be included in the O. & M. manuals.

Allow for a subsequent instruction session with the Client representative when the facility is operational to provide refresher instruction to the end user on the system operation and maintenance requirements in accordance with IS3218.

8.0 INTRUDER ALARM SYSTEMS

8.1 Scope of Work

The Contractor shall extend the existing school system to provide Intruder Alarm System for the new extensions in compliance with IS EN 50131/1:2006 as specified herein and as detailed on the drawings.

The existing Main School is protected by a HKC 16120 intruder alarm system which is to be modified and upgraded/extended as required to provide coverage to the proposed extensions.

The intruder alarm system shall comprise of magnetic contact perimeter protection to each entry / exit door to the building and dual technology passive infrared motion detectors to the classrooms and circulation areas. The exact zoning configuration is to be confirmed with the School Authority prior to commencement.

Where exposed, wiring will be drawn into galvanised steel conduit. In ceiling spaces etc., wiring may be installed on the ELV cable carriers. Conduit drops to items or equipment and devices will be exposed / surface run throughout. Exposed conduit shall be painted in to match existing wall finishes.

Wiring for 230 volt mains power supplies to any devices shall be carried out in 4 sq.mm LSF insulated cables drawn into galvanised steel conduit and will be taken from a 10 amp MCB to a 5 amp un-switched, fused spur outlet, without neon indicator, in each case.

The existing intruder alarm digidialler and interface with the Main Fire Alarm system shall be retained to initiate alarm signal in the remote monitoring station in the event of a fire condition.

The contractor shall allow for power supplies for security equipment as required by the specialist security alarm company whether indicated on the drawings or not. Details of the intruder alarm power requirements shall be provided with tender.

8.2 Testing and Commissioning

Commissioning certificates must be fully completed by both the systems and wiring contractors before Practical Completion will be awarded.

8.3 Client Staff Instruction - Manuals and Drawings

The users shall be instructed in the operation of the upgraded system at Practical Completion or shortly thereafter. At this time, a commissioning certificate and as-installed drawings and an operations manual must be handed over.

Two further copies of the above must also be included in the O. & M. manuals.

9.0 CCTV SYSTEMS

The existing CCTV Cameras are to be relocated as indicated on the drawings to provide CCTV coverage to the extended school as detailed herein and on the drawings.

The existing CCTV system is located in the principal's office. The alterations to the CCTV system shall be completed under this electrical contract by the schools existing CCTV maintenance contractor.

Where exposed new CCTV wiring will be drawn into galvanised steel conduit. In ceiling spaces etc., wiring may be installed on the ELV cable carriers provided for elsewhere in this document.

Wiring for 230 volt mains power supplies to any devices shall be carried out in 4 sq.mm LSF insulated cables drawn into galvanised steel conduit and will be taken from the existing supply circuit.

The CCTV systems shall comply with IS EN 50132/7:2006

9.1 Testing and Commissioning

The contractor shall include for testing and re-commissioning of the CCTV System by the schools existing CCTV specialist under this contract.

10.0 ANCILLARY SYSTEMS

10.1 Cable Containment Systems

The Contractor shall supply and install supplementary cable tray, conduit, and trunking and RICO tube system in accordance with Specifications as required to complete the upgrade works. Existing main cable containment runs in corridor ceiling voids shall be utilised where feasible to connect to existing systems, however where necessary the Contractor shall include for additional containment as required for complete fully contained cable installations.

Main Cable Containment Runs shall comprise of;-

- LV Cable trunkings
- LV Cable trays for sub mains
- ELV / ICT cables trays

All cable trays shall be medium duty galvanised steel trays.

Conduits and Rico tubes are not shown on the drawings, however the contractor shall include for the installation of all Rico tubes and conduit as required to provide a fully complete working installation.

Containment requirements for the ICT and Security systems shall be strictly as detailed on the drawings. The contractor shall allow for liaison with the Specialist Systems Contractor on site to confirm exact containment requirements prior to installation. No 'clipped direct' cable installation will be permitted.

The Contractor shall size all cable containment to suit the installation in strict accordance with ETCI regulations. The contractor shall include for all tees, joints bends etc. as required to carryout the installation. Proprietary equipment only shall be used.

ICT Trunkings and cableways must be sized to 2.5 times the requirement of the current installation, i.e. if current installation is 2 cables then cableways must be sized for 5 cables. ICT cableways shall be completely separate from electrical power installations where possible.

The Contractor shall co-ordinate the installation of the cable containment system with all other services and shall submit fully co-ordinated layout drawings for review prior to installation.

10.2 Earthing and Bonding

The Contractor is to supply and install a complete earthing and bonding system in accordance to the ETCI National Rules for Electrical Installations. The Contractor is to supply a separate protective earth cable for all final circuits the size of which is to be in accordance with ETCI Regulations.

The conduit/trunking systems are not to be used for earthing but are to be electrically continuous.

All pipework, sinks, ductwork, are to be bonded to the earthing system and are to be electrically continuous.

10.3 Electrical Services for Mechanical Systems

The Contractor shall supply and install electrical services associated with the mechanical systems. Electrical contractor to provide power supplies terminating in a lockable local isolator located adjacent to each mechanical equipment item.

11.0 BUILDERS WORKS

The main contractor shall be responsible for all elements of Builders Works as required to complete the electrical installations as described. The electrical contractor shall allow for setting out and supervising all such builders' works.

APPENDIX A
DRAWING SCHEDULES

DRAWING & DOCUMENT SCHEDULE



Fahey O'Riordan
Consulting Engineers

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APPENDIX B
MCB BOARD SCHEDULES



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Schedule Cover Page

Project: CBS Thurles Secondary School - Three Classroom Building
Job Nr. 1716
Document Nr. 1716-ES-01

Schedule: MCB Board Schedules

Revision Details

Rev. No.	Description	Prepared	Checked	Approved	Date
T0	Tender Issue	SR	JF	J. Fahey	29/06/2017

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