

CONSULTANTS REPORT

1 (a) Approx. area of entire school in sq. m 4,950m²

1 (b) Approx. area of where works are proposed in sq. m 4,950m²

1 (c) Describe the part(s) of the building for which the proposed project is required. Include, if applicable, details of number of rooms affected, size or area of the building affected etc.

This application relates to emergency upgrade of the Electrical Installations in this school which are deficient and have led to a number of serious fire incidents in the school and also the life safety systems and gas safety system which are a combination of various alterations and extensions completed to now obsolete design standards. It is proposed to upgrade the electrical installations in accordance with current Irish Standard IS 10101 National Rules for Electrical Installations, DoEY TGD 003 and 031, Building Regulations and Life Safety Systems Standards IS 3217:2023 Emergency Lighting and IS3218:2024 Fire Detection and Alarm.

The school building comprises a floor area of approx. 4,950m² and was constructed on a phased basis between the early 1960s and 2005 approximately as shown in **Figure 1** below.

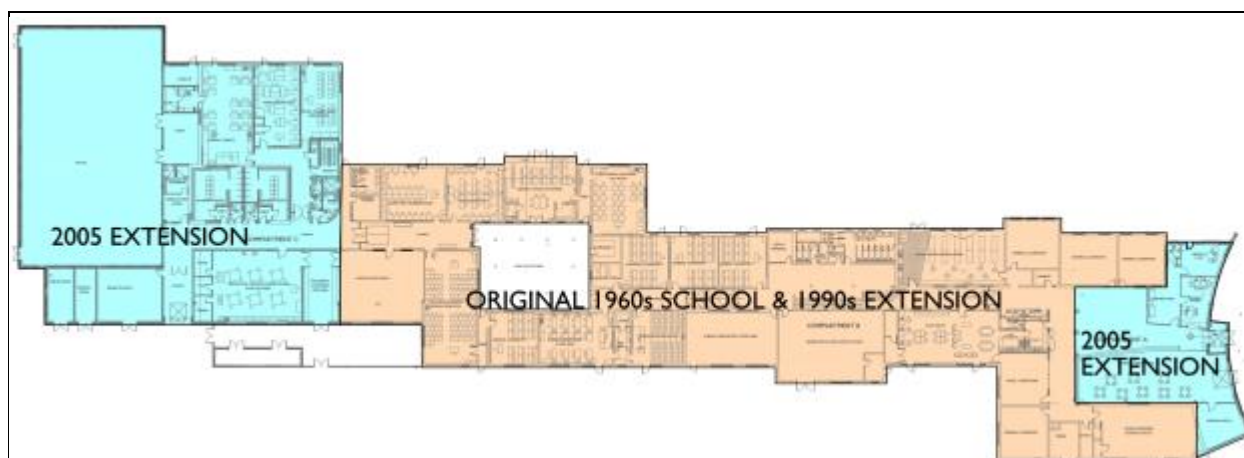


Figure 1:- Coláiste Mhuire Askeaton Ground Floor Plan (NTS)

The main school accommodation is listed as follows:-

1960s & 1990s School Building – 2,395m²

- Twelve Mainstream Classrooms
- Home Economics Room
- Music & Drama Classroom
- Staff Room
- Arts & Crafts
- Senior Metalwork Room / Engineering
- Two Science Labs & Demonstration Room
- Mechanical Drawing Room
- Library
- Two Computer Rooms
- Woodwork Room
- Offices
- Circulation Corridors & Toilets
- Boiler Room
- Electrical Switchroom

2005 Extension Part 2 Storey = 2,555m²

- Entrance Lobby & Social Area
- Reception & Principals Office
- Meeting Room
- PE Hall, Changing Rooms & Stores
- Construction Studies & Projects Room
- Science Lab & Prep Area
- Dress Design Room
- Social Studies Room
- Boiler Room
- Toilets
- Circulation Corridors, Stairs & Lift
- Three General Classrooms
- Tuition Room
- Pastoral Offices
- Social Area & Viewing Balcony

2 Provide a full explanation of the nature and extent of the emergency with supporting photographs as per Appendix 1 Circular 0018/2011

Element 60 – Power Supply & Distribution

The school is served by a 3 phase ESB supply which connects from a pole on the footpath on Church Street to the front of the school and routed underground to the Main Board / ESB CT metering located in an electrical room in the 1960s building - see **Figure 2** and **Figure 3** below:-



Figure 2:- Square D Main Board with ESB CT Meter on back wall adjacent



Figure 3:- ESB CT Meter Cabinet

The Main Board is of Square D manufacture and is rated at 400 Amps while the incoming ESB supply is fused at 125 Amps with 100/5 Amp CT metering connecting to the Main Board as shown below at **Figure 4**. The Main Board dates from the extension constructed in the 1990s and does not comply with current ESB Customer Interface or IS 10101 regulations regarding customer interface standards. The electrical switchroom also doubles as a cleaners store with shelving and storage on the wall opposite the Main Board which reduces the clearance to the front of the board to less than the minimum required clearance of 1200mm and is in breach of regulation. This storage shelving must be removed and relocated to another space

The main incoming ESB fuses are rated at 125 Amps which is lower than the customer's main circuit breaker and some of the sub main feeder breakers on the board. There is therefore no co-ordinated discrimination / selectivity with the current switchgear arrangement. There have been a number of incidents where the main ESB Fuses have blown while the circuit breakers immediately upstream of the fault have not tripped which has resulted in total power failure to the entire school for faults that should have been isolated locally.

The most recent fault occurred in the Home Economics Room on January 19th when a faulty isolation transformer serving the classroom general service sockets blew one of the main ESB fuses causing total loss of that phase throughout the school leaving 1/3rd of the school without

power while the MCBs on the transformer unit itself, at the Sub Board incomer and the MCCB at the Main Board did not trip. We would attribute this to the nature of the fault on an isolated transformer which had lost its protective earth on the primary side resulting in excessively high fault currents flowing which did not trip the protective circuit breakers due to the lack of earth continuity.

There are fourteen sub main MCCB feeders serving Sub Distribution Boards located around the school with ten rated at 63 Amps, two rated at 100 Amps, one rated at 125 Amps and one rated at 250 Amp which feeds the 2005 extension refer to **Figure 5** below.



Figure 4:- Main Board ESB Fuses rated at 125 amps with 100/5 amp CT metering



Figure 5:- Square D Main Board with 14 Nr. TPN sub-feeders rated 63 to 250 Amp

The sub main cables are four core, steel wire armoured type mainly with brown red and yellow phase conductors and blue neutral and with no dedicated protective earth conductor but with the Steel Wire Armour (SWA) acting as the earth. There are however other colour codes present with the older Red, Yellow and Black Phases with Blue neutral present and also the more recent Brown, Black, Grey and Blue neutral also present refer to **Figure 6** below.

There is one feeder which has two sub main cables connected as shown in **Figure 7** below and appears to be serving two sub boards which is very poor installation practice.

The Main Board has a main neutral bar as shown in **Figure 8** and a main earth bar as shown in **Figure 9** with a neutralising link between the two bars. There are only five earth cables terminated onto the main earth bar with the sub main cables dependant of the Steel Wire Armour (SWA) for connection of the protective earth to Sub Boards

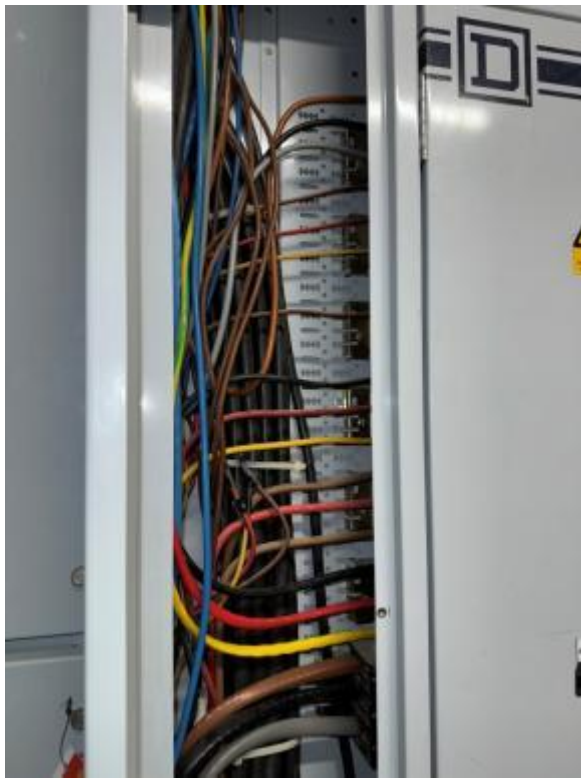


Figure 6:- Main Board sub main cable duct with mixed colour codes evident



Figure 7:- Main Board sub main cable duct with parallel cable connected to one feeder



Figure 8:- Main Board Main Neutral Bar

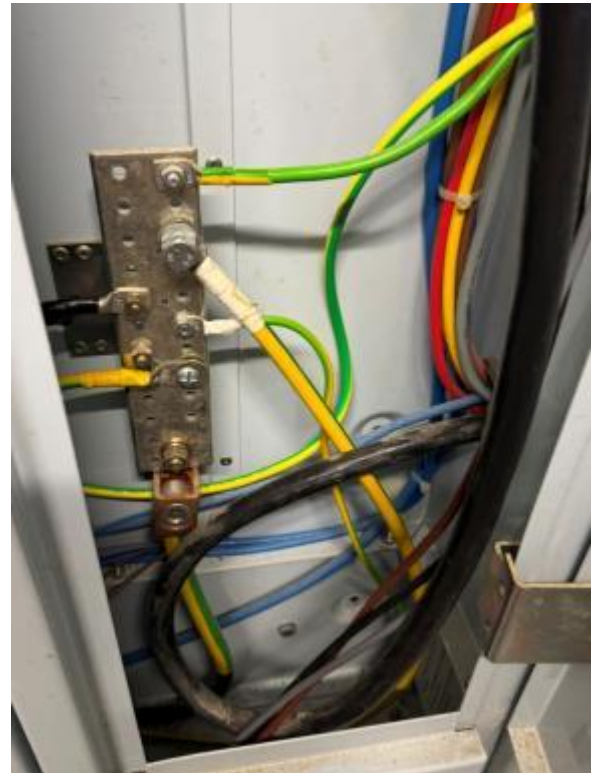


Figure 9:- Main Board main Earth Bar

The steel wire armour of the sub mains cables are glanded into the header trunking above the main board with the SWAs providing the protective earth as shown below in **Figure 10** and the header trunking is bonded to the main earth bar however there are no earth tags fitted to connect the gland / SWA directly to the main earth bar. This earthing arrangement with the SWA and trunking providing the protective earth to the sub boards is not compliant with the current edition of IS-10101:2020+A1:2024 which requires dedicated earth conductors.

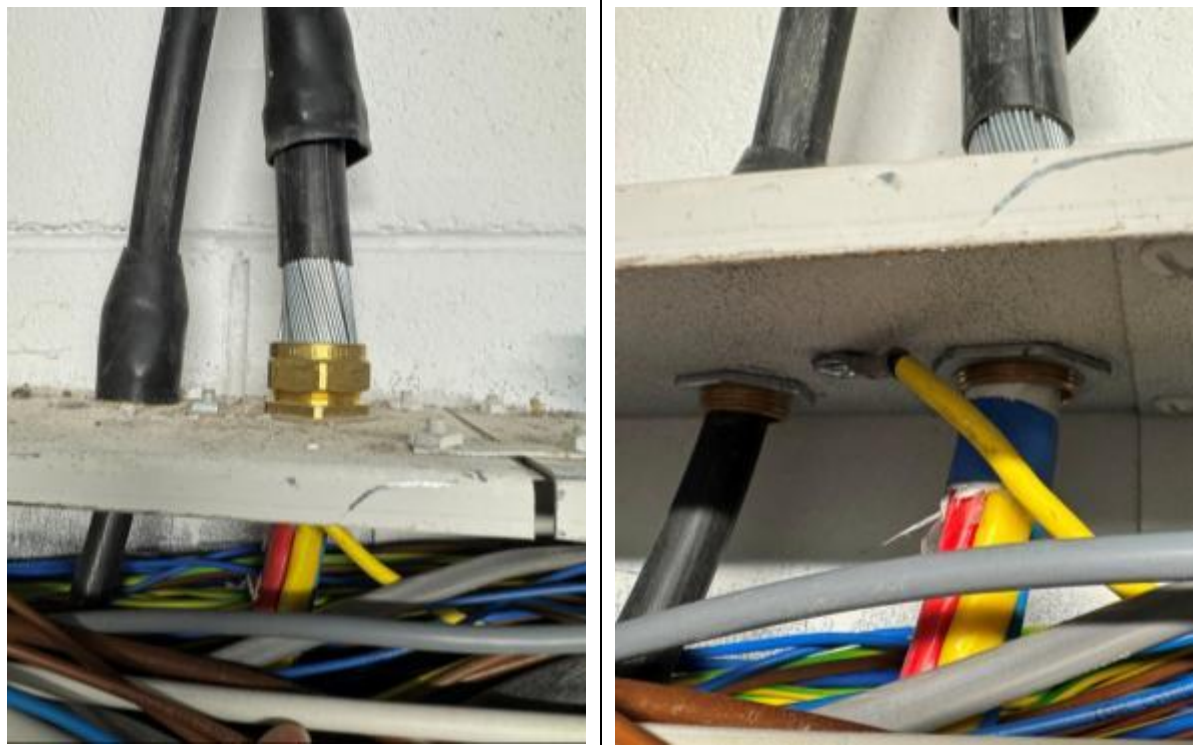


Figure 10:- Sub main SWA cables glanded onto the main header trunking over the main board with a earth conductor link from the trunking to the main earth bar

At the sub board the SWA cables are generally glanded directly to the sub boards mild steel frame, which are a painted sheet metal construction, and the earth bar terminal is bolted onto the panel frame as shown in **Figure 11** below. Over time the earth continuity can degrade and be lost due to corrosion of these mild steel connections as evidenced by the recently completed Periodic Inspections in the Metalwork / Engineering Room and Science Lab.



Figure 11:- Sub main SWA cables glanded onto the sub board metal cabinet (photo on the left) and the earth bar is fixed to the cabinet (photo on the right)

This earthing arrangement is also used for the Main Board Equipment Power, General Service and Lighting Board final circuits as shown in **Figure 12:-** Terminal sections of the Main Board General service and lighting boards



Figure 12:- Terminal sections of the Main Board General service and lighting boards

The existing main header trunking at the Main Board is over filled with cables as shown in which would need to be de-rated due to overheating which is a potential fire risk particularly in an installation with deficient earthing.

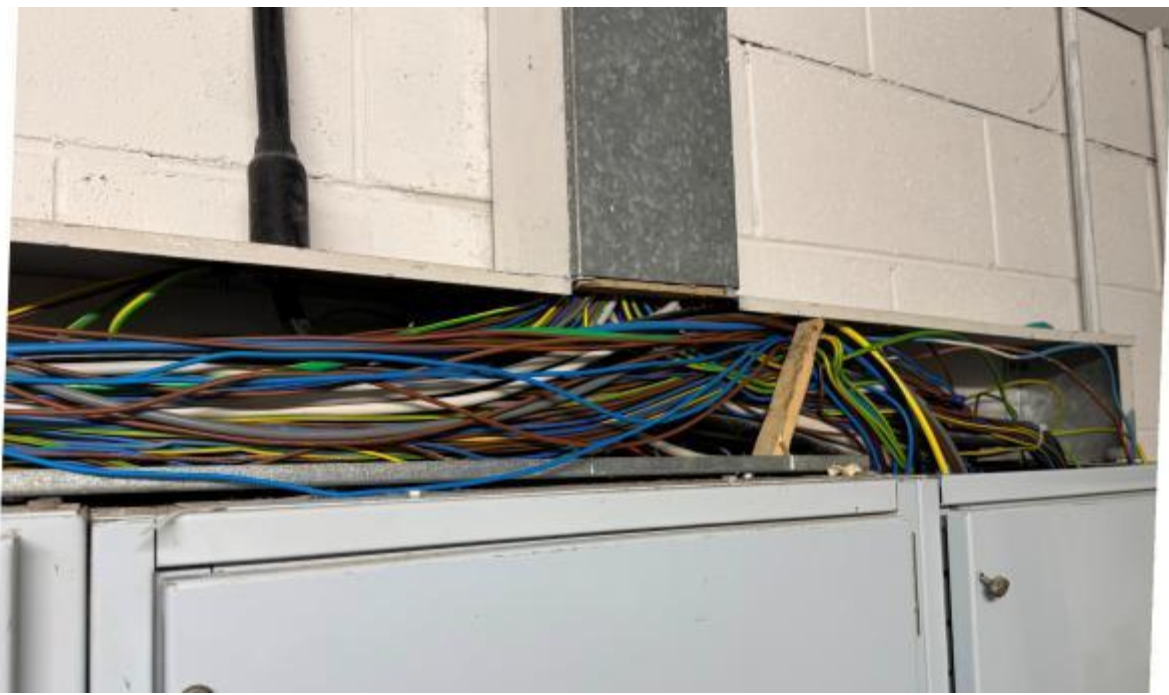


Figure 13:- Header Trunking at the Main Board is overfilled with non-compliant space factor

Sub Distribution Boards

Sub distribution boards are located in the practical classrooms throughout the 1960s and 1990s building and are generally Square D TPN type boards as shown **Figure 14** below.



Figure 14:- Square D Sub Board in the Home Economics Classroom with SWA cable glanded at the top in the centre which connects to a 63 Amp incomer MCB in the centre panel which serves an 18 way MCB board fitted with six MCBs for fixed equipment in the LHS Panel and also an 18 way RCD board on the RHS serving the socket circuits via an isolating transformer mounted above the Board at the left hand side.

These Practical Classroom Sub Boards are each provided with a safety isolating transformer which was a safety design measure used under the wiring regulations in force at the time in the 1990s and which is no longer used. Modern practice requires the use of RCD circuit protection for final circuit protection with dedicated earth conductors for each circuit.

On January 21st there was a fire incident at the Home Economics Sub Board caused by a fault on the safety isolating transformer serving the socket circuits, shown in **Figure 15** which resulted in one of the ESB fuses blowing and loss of power to 1/3rd of the school. Neither the local Sub Board MCB protective device nor the Main Board MCCB Feeder operated to isolate the upstream fault resulting in the ESB fuse blowing and general loss of power to the school. The failure of the upstream protective switchgear to operate is likely as a result of loss of earth continuity to the sub board and transformer primary side.

The Home Economics Board has now been switched off pending completion of emergency remedial works and only the lighting is operational in the classroom. As a result of the fault the school cannot deliver the home economics practical curriculum and have lost valuable teaching time due to the resulting power outage to other areas of the school.



Figure 15:- Failed Home Economics Room Sub Board Safety Isolating Trasformer.

The school report that the fire gave rise to a significant amount of smoke in the store room housing the board but that the fire detection and alarm system did not detect the fire-raising serious concern for the school authority as to the adequacy and operability of the existing fire detection and alarm system.

The Arts and Crafts Sub Board with covers removed is shown in **Figure 16** below. The arrangement is typical of all Practical Classroom Sub Boards. The incoming SWA cable is glanded at the top left-hand side and connects to a 63 Amp MCB incomer in the centre section which serves a 12 way MCB board fitted with six 25 Amp MCBs for fixed equipment in the LHS Panel and a 12 way RCD board fitted with six 25 Amp RCDs in the RHS Panel serving the socket circuits via a safety isolating transformer.

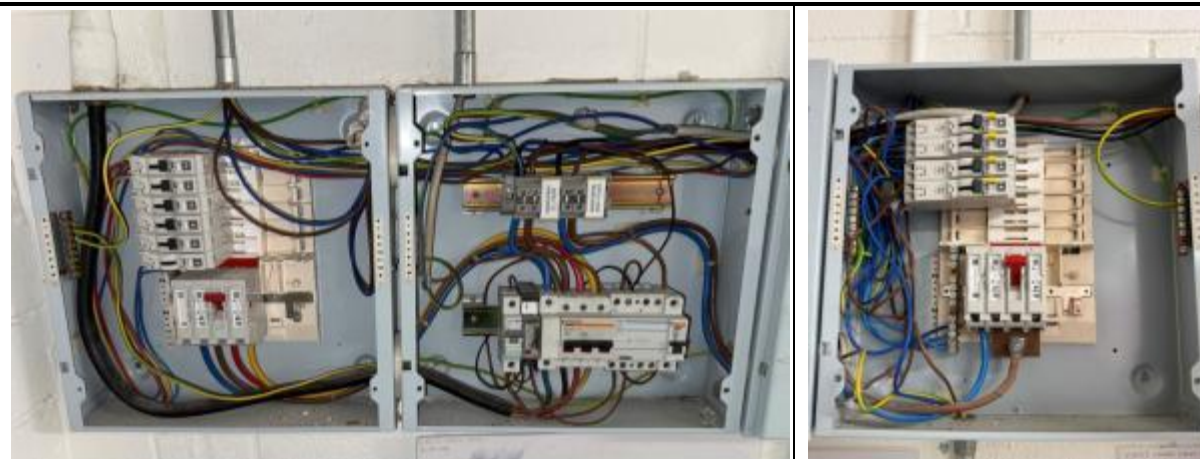


Figure 16:- Square D Sub Board in the Arts & Crafts Classroom

We recommend completing a full replacement upgrade to the power supply and distribution system throughout the 1960s and 1990s school building areas.

Element 62 – General Service and Equipment Power

The existing general service power systems in the original 1960s and 1990 school date from the 1990s and are in poor condition and do not comply with current standards regarding earthing. Various alterations and additions over the years are to a very poor standard with some completed in twin and earth in PVC conduit and these installations are not compliant with the current IS 10101 or TGDs.

The original 1990s installations were completed in PVC singles in galvanised steel conduit and trunking with the steel containment acting as protective earth and no dedicated earth conductor.

The cable colour code in use in these 1990 installations is brown phase and blue neutral with the containment acting as protective earth – refer to socket outlets shown in **Figure 17** below.

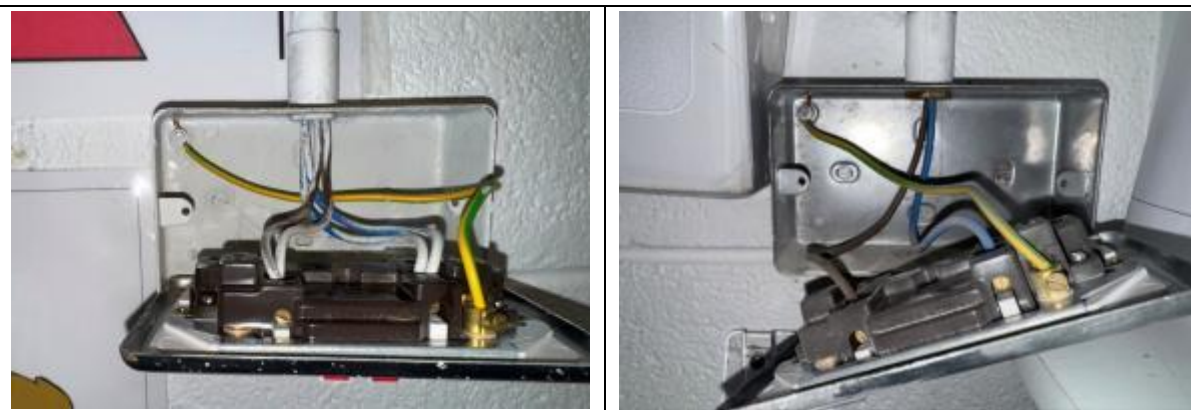


Figure 17:- General service socket in 1990s extension with brown phase and blue neutral and the mild steel containment alone providing the protective earth

The Engineering Room equipment final circuits do not have dedicated earth or neutral conductors. The ample PIR completed recently has identified that the earthing provided by the mild steel conduit and trunking system has degraded over time and is no longer providing earth continuity and the installation has failed testing.

There are damaged cables running in a kopex flexible conduit to the lathe and the local isolator is taped off with “DO NOT USE” written on the tape as shown in **Figure 18** to **Figure 20** below.

The circuits serving the fixed equipment are wired in three phase with the mild steel conduit providing the protective earth and there are no neutral conductors provided as shown in **Figure**

21 below. As a result, modern equipment with display screens which are being procured by the school and which require a neutral cannot be placed in service until the system is upgraded.



Figure 18:- Old style local isolating switch in Engineering Room serving the lathe with DO NOT USE tape due to damaged wiring



Figure 19:- Circuit serving the lathe is run in the floor to a kopex flexible conduit which is damaged exposing pvc singles



Figure 20:- Engineering Room local isolator taped off but isolator switched on and in service

Figure 21:- Engineering Room Three Phase Isolator with no neutral and conduit as protective earth

The PIR also made other Category 1 observations in the PIR including no earthing to light switches and all sockets, damaged sockets on workbenches, all of which require urgent attention - refer to the accompanying PIR for the Engineering Room and Science Lab.

More recent additions to the electrical services have been completed in moulded plastic conduit as shown in **Figure 22** below.



Figure 22:- Recent additions wired in PVC conduit serving fixed equipment.

Element 63 – Lighting & Emergency Lighting

The lighting and emergency lighting was upgraded to LED fittings throughout the school under an SEAI energy efficiency project completed circa 2018. The school report that these LED fittings has been failing with multiple units not working as evident in the classroom shown below at **Figure 23** with two failed fittings. The replacement LED fittings were the lowest cost option tendered at the time and are clearly a budget product which has a short service life. The replacement fitting were all connected to the original wiring installation which was retained throughout and the new LED lighting system is dependent on the original mild steel containment for the protective earth as shown in **Figure 24** below.



Figure 23:- Lighting has been upgraded to LED through the school



Figure 24:- No earth conductor to the Light circuits which depend on the mild steel conduit for the protective earth

The original emergency lighting would have been designed to a now obsolete standard, probably the 1989 edition and is not compliant with the current IS 3217:2023 standard and additional

emergency lighting is required to achieve compliance particularly at points of emphasis, such as manual call points / firefighting posts as shown in **Figure 25** and on escape routes, open areas and for system integrity.

Additional emergency light fittings will be required to achieve full compliance. We also note that provision of emergency lighting does not comply with the current IS3217:2023 standard particularly with regard to points of emphasis and escape route illuminance as in the main double height circulation space shown in **Figure 26** below and additional emergency light fittings are required to achieve compliance with the 2023 edition of the standard.



Figure 25:- Points of emphasis are not adequately covered by emergency lighting

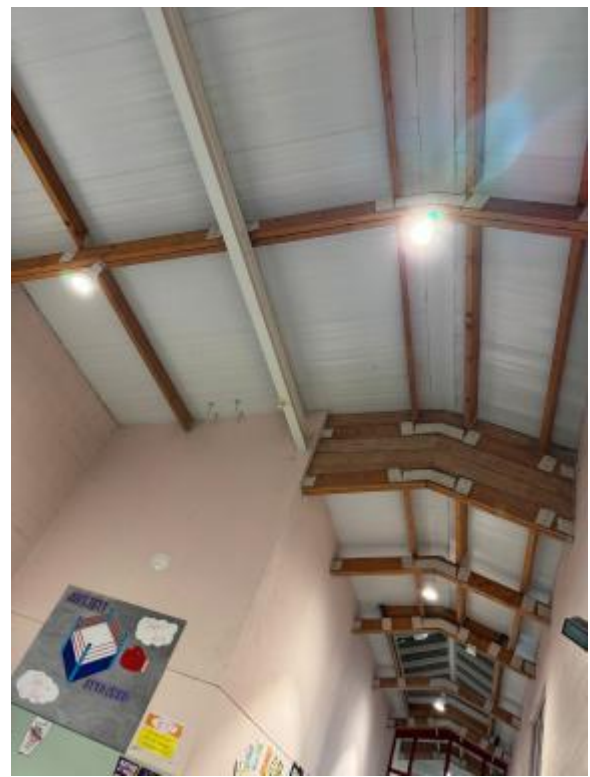


Figure 26:- Escape routes emergency lighting is not compliant with current standard

The replacement LED emergency lights installed in 2018 are now nearing 8 years in service and the batteries are all close to end of normal service life.

It would be necessary to remove, store and reinstall the existing LED lighting and emergency which in our view would be a short-sighted undertaking for fittings that are close to end of service life as evidenced by the high failure rates reported by the school.

We therefore recommend a full replacement upgrade of the lighting and emergency lighting throughout the entire school to include new LED fittings with automatic daylight and absence detection energy saving controls as part of the proposed electrical upgrade works.

Element 65 – Fire Detection & Alarm System

The Fire Detection and Alarm system comprises a 12 zone conventional control panel shown in **Figure 27** below which is the original 1960 & 1990s system which has been extended to provide protection to the 2005 extensions and is now passed end of service life and requires replacement upgrade.



Figure 27:- Existing 12 zone conventional C-Tec Fire Alarm Panel in fault on zone 7



Figure 28:- Existing system is not L3 with some classrooms and escapes unprotected.

The category of protection does not appear to be type L3 as required by current building regulations as there are some rooms adjacent to escape corridors without automatic smoke detection refer as shown below in **Figure 29** and the main double height circulation corridor in the original 1960s / 1990s school has sections with no visible smoke detection as shown in **Figure 30** and current detector spacing does not meet requirements for type L3.



Figure 29:- Mainstream cClassroom with no automatic smoke detection fitted



Figure 30:- Main double height corridor with inadequate automatic smoke detection.

A recent fire incident in the home economics room sub board did not activate the fire alarm despite copious amounts of smoke having been emitted by a faulty safety isolating transformer which blew the main ESB fuse.

The fire alarm cable installations are a mixture of MICC in the original school as shown in **Figure 31** and **Figure 32** below with later alterations and extensions wired in Firetuf.



Figure 31:- Fire alarm call point wired in MICC Cable in the original building



Figure 32:- Fire Alarm sounder and strobe wired in MICC Cable in the original building

The 2005 extension fire alarm is wired back to the control panel in SWA cable run underground externally with link boxes at either end as shown below in **Figure 33** below. The 2005 extension is wired in red Firetuf which is run in shared trays and trunkings with the other services as shown in **Figure 34** and **Figure 35** and loosely above the suspended ceilings as shown in **Figure 36**.



Figure 33:- Fire Alarm cables to the 2005 extension run via U/G SWA to joint box



Figure 34:- Fire Alarm cables share tray with other services in the 2005 extension

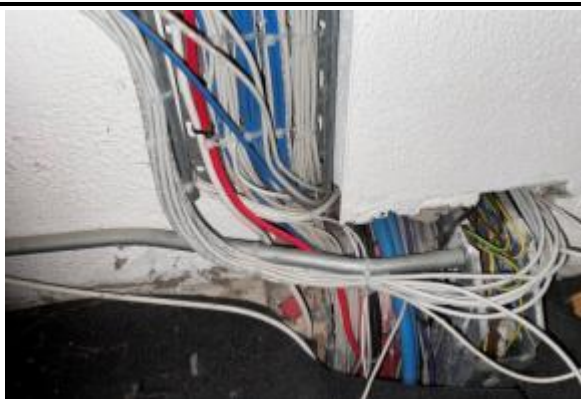


Figure 35:- Fire Alarm cables share tray with other services in the 2005 extension

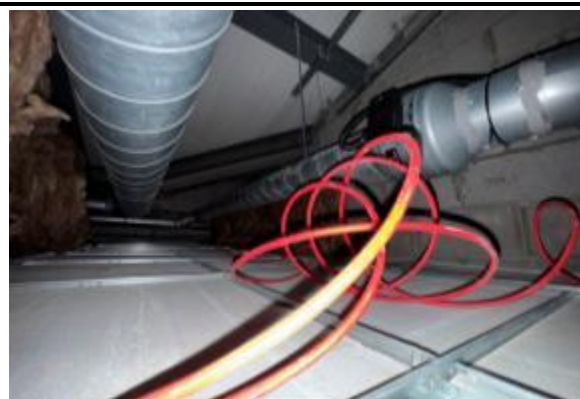


Figure 36:- Fire Alarm cables share tray with other services in the 2005 extension

These are considered substandard non-compliant cable installations under the current Fire Alarm standard IS3218:2024 and we therefore recommend a full upgrade to new type L3 addressable fire detection and alarm system with automatic detection fitted to all escape routes and adjacent rooms with new fire rated fire alarm cable run on fully segregated containment with fire rated fixings in full compliance with the current IS 3218:2024 standard.

Element 54 – Gas Safety Systems

The existing Master gas pressure proving system has failed and the school have no gas services to the practical classrooms including Home Economics, Engineering and Science Labs. The practical rooms are supplied with LPG which is stored in 34kg bottles located in an external compound as shown in **Figure 37**. The system is fitted with an automatic changeover arrangement as shown in **Figure 38** and there is a spare bottle kept on site.



Figure 37:- Five 34kg LPG gas bottles for practical classrooms gas services



Figure 38:- Master Pressure Proving Control Panel is now an obsolete unit

The master pressure proving slam shut valve as shown in **Figure 39**, is controlled by a pressure proving control panel Medem model GPPS-L, as shown in **Figure 40**, located in the admin office. This system has failed and is no longer serviceable and requires replacement as the external slam shut valve and pipework is showing advanced corrosion and the control panel is now an obsolete model.

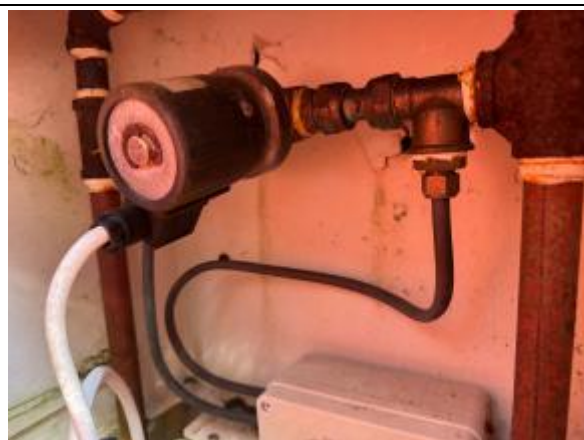


Figure 39:- Five 34kg LPG gas bottles or practical classrooms gas services



Figure 40:- Master Pressure Proving Control Panel is now an obsolete unit

Each of the individual practical classrooms are fitted with a local slam shut valve and pressure proving control panel Medem Model GPPS-B as shown in **Figure 41** below which are also an obsolete model which have passed end of recommended service life. Final appliance connections to gas equipment such as the Home economics cookers shown in **Figure 42** are at end of service life and require full replacement upgrade.



Figure 41:- Five 34kg LPG gas bottles or practical classrooms gas services



Figure 42:- Gas service connection to gas cooker in the Home Economics Room

We recommend a full upgrade of the gas safety pressure proving systems and associated electrical installations as part of the electrical upgrade. The existing gas pipework and distribution system will require integrity testing and certification and will require to be painted yellow and the final connections to all gas appliances should all be renewed as part of the proposed gas upgrade

3. When did the need for these emergency works first arise?

The school authority commissioned Periodic Inspection of the Engineering Room and Science Lab 2 which was completed by Pat Fitzgerald Electrical Contractor September 2025. The inspection report identified multiple deficiencies with the existing electrical installations, in particular the deficient earthing system.

A fire occurred in the Sub Board serving the Home Economics Room in January 2026 which is attributed to the deficient earthing system and safety isolating transformer system.

The gas service failed over summer 2025 and has been out of service since then.

4. What action has the school taken to manage the emergency?

The school has retained a registered electrical contractor to complete periodic inspection of the electrical installations in Engineering Room and the Science Lab 2 in accordance with the current IS10101 National Rules for Electrical Installations and has received PIR reports with category 1 observations which require urgent attention but the scale of which is beyond the capital resources of the school and emergency grant funding is urgently required.

The school has isolated the Sub Distribution Board in the Home Economics Room and has switched off defective circuits pending completion of emergency upgrade works.

The school has isolated the gas service to the practical rooms pending completion of remedial works.

The School Authority commissioned a consulting engineer to prepare this report to seek emergency grant funding to complete a full upgrade of the electrical services and gas safety systems to current wiring regulations and TGDs.

5. When was the affected part(s) of the building last replaced and/or remedial works carried out? Where applicable, a description of previous remedial works should be included.

The electrical installations in the 1960 / 1990 buildings date from the 1990s and would have been completed to the standards in force at the time which would have used the mild steel containment and steel wire armour of the sub main cables to provide the protective earth. Only minor piecemeal alterations and additions have been completed to the electrical installations since then.

The lighting and emergency lighting which is a self-contained system with standalone emergency fittings was upgraded to LED circa 2018 under an SEAI funded scheme, however the project was awarded on lowest cost and the LED fittings have proved to have a short service life with many units having already failed. The replacement lights were all connected to the pre-existing wiring installations and distribution boards which were retained and there are no earth conductors with the installation dependant on mild steel containment and the steel wire armour of the sub mains cable for protective earth.

The gas and gas safety systems date from the original 1990s construction.

The 2005 electricals installations date from the original construction with only minor alterations and additions completed over the intervening years.

6. What evidence is there of an effective maintenance programme for the affected area?

The school has full time caretaker staff who attend to the day to day maintenance issues and the school appears to be reasonably well maintained. An electrical contractor is retained to complete ongoing minor repairs and alterations to the electrical installations.

There is a biannual maintenance contract in place for the Fire Alarm system with a schedule of service/testing affixed to the wall adjacent to the control panel indicating testing was completed on July 1st 2024, Feb 17th 2025 and October 30th 2025 i.e. biannually

For the affected area

Is there an Inspection/Maintenance Programme in Place?
If Yes How many times a year is Maintenance carried out?

Y	✓	N	
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Biannual

Name the Person/Company & contact details responsible for Maintenance.

Fire - Q3 Security Services Limerick Tel 061 353533 mobile 087 6061515, email info@q3.ie
Electrical – Pat Fitzgerald Electrical Askeaton Tel 086 832 6202 email patfitzgerald@ive.ie

Please provide any additional information in relation to your
maintenance programme that may be relevant to this application

7. In your view, how would the school be affected if the proposed works were not carried out?

If the proposed electrical services upgrade works are not carried out the school will continue to operate in a building with sub-standard dangerously deficient / non-compliant electrical installations which will continue to present serious hazards to the health and safety of the entire school population due to potential electrical hazards with risk of fire or electrical shock / electrocution should the deficient protective switchgear fail to operate due to defective earthing or obsolete switchgear which has passed end of economic service life and which requires full upgrade replacement.

If the Life Safety Systems are not upgraded the school will continue to have a substandard Fire detection and alarm system not in compliance with current IS 3218:2024 regulations and TGDs with a risk to the health and safety of the entire school population should a fire go undetected. Which could be exacerbated by the deficient emergency lighting system which is not in compliance with the current IS 3218 2023 standard.

If the gas services and gas safety systems are not upgraded to the practical rooms the school will continue to be unable to deliver the full practical curriculum as the gas systems will have to remain isolated.

8. Outline the minimum works necessary to address the emergency only.

The minimum works necessary to ensure that the school has a safe electrical, life safety and gas safety installations are as follows-

- Complete immediate temporary remedial works to the Home Economics Room and Engineering room to enable safe delivery of the practical curriculum until summer 2026
- Upgrade the incoming supply in compliance with current ESB customer interface and IS10101 regulations including provision of capacity for future heat pump upgrade
- Isolate decommission and remove the existing defective, end of life Distribution Boards and obsolete switchgear and replace with new Distribution Boards and sub main distribution cables with earth conductor in full compliance with current Irish Standard IS 10101:2020+A1:2024 National Rules for Electrical Installations
- Isolate, decommission and strip out the existing non-compliant wiring installations and rewire the school in full compliance with the current wiring standard IS 10101 and TGD 003 and 031 with new galvanised steel containment throughout and new final circuits with full size protective earth conductor. Retain existing containment where feasible including final conduit drops
- Isolate and decommission existing obsolete gas services and gas safety systems
- Relocate cleaners store out of the Electrical Room to provide the required clearances
- Provide new general service and equipment power outlets throughout the 1960s & 1990 school building including adequate provision of services to current TGD standard
- Full general lighting upgrade and rewire to current wiring standards with full size protective earths to the 2395m² 1990s building and upgrade of the fittings only to the 2555 m² 2005 extension areas
- Upgrade the emergency lighting to comply with the current IS 3217:2023 throughout the entire 4,950m² school
- Full Fire Alarm upgrade to provide an addressable system to current IS 3218:2024 standard throughout the entire 4,950m² school
- Remedial works to the existing gas distribution pipework system including replacement of the auto changeover system and painting of all pipework yellow and replacement of final connections and hoses
- Provision of a new master gas pressure proving system and local pressure proving systems to the practical rooms
- Associated general builders work including coring opes, opening up and reinstatement and making good and redecoration to match existing finishes
- Construct a new external a new external door to the electrical room for compliance with current ESB interface guidelines
- Trenching and ducting from the existing ESB Service from the building to the new supply point (assumed to be the street).