

EMERGENCY WORKS SCHEME

COLÁISTE MHUIRE CO-ED, CASTLEMEADOWS, THURLES, CO. TIPPERARY MECHANICAL UPGRADE WORKS (GAS SERVICES)

**Works Requirement document – Volume A.2.3.2.1
Specification of Performance, Standards and
Materials**

For

Mechanical Services Installation Upgrade Works

Project Ref: 0850

Date: August 2026

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Project: *Coláiste Mhuire Co-Ed, Castlemeadows, Thurles, Co. Tipperary.*

Specification

For The

Mechanical Services Installation Upgrade Works (Gas Services)

DoEY Emergency Works Scheme 2026

Employer:

Tipperary Education and Training Board
Castlemeadows,
Racecourse,
Thurles,
Co. Tipperary

Services Engineer/PSDP:

Geaney Engineering Consultants
Studio 22.,
Waterford Business Park,
Cork Road,
Waterford.

Main Contractor/PSCS:

T.B.A.

REV	ISSUE	DATE	DOCUMENT	AUTHOR	APPROVED
	Tender Issue	25/08/26	0850 – Mechanical Specification	KM	JG

SECTION 1: PRELIMINARIES AND GENERAL CLAUSES:

01. Description Of Site:

The site is the existing Coláiste Mhuire Co-Ed, Castlemeadows, Thurles, Co. Tipperary which is easily accessible from the road. The site boundaries are defined on the accompanying drawings, and this Contractor shall confine his operations to the area indicated.

This Contractor shall be deemed to have made a thorough examination of the site and all features thereof, the existing premises, together with all internal and external services, adjoining premises and property or other things affecting the proposed works, to ascertain precisely the nature and extent of same and the condition under which the works will have to be executed, as no claim will be allowed on the grounds of want of knowledge in this respect. For full details refer to the Preliminary Health and Safety Plan accompanying this specification.

02. Description Of Works:

The works covered by this specification comprise the Mechanical Services Installation works associated with the replacement of the existing LPG gas installation serving the specialist teaching accommodation at Coláiste Mhuire Co-Ed, Thurles.

The scope of the works includes the following:

- Isolation, purging, disconnection and removal of the existing LPG storage and distribution installation.
- Installation of a new four-cylinder LPG storage and manifold system, complete with secure ventilated enclosure, regulators, valves and associated equipment.
- Installation of new underground and above-ground LPG distribution pipework.
- Installation of new internal LPG pipework serving the science, home economics and metalwork classrooms.
- Replacement of the existing classroom gas taps and associated isolation arrangements, as indicated on the drawings.
- Installation of master and local gas proving systems, emergency gas knock-off points, LPG detectors and carbon monoxide detectors.
- Associated electrical supplies, controls, dedicated containment and fire-alarm interfaces.
- Associated trenching, penetrations, fire-stopping, reinstatement, painting and making good.
- Testing, purging, commissioning and certification of the complete LPG installation.
- Provision of record drawings, operating and maintenance manuals, test records, certificates, Safety File information and staff training.

The Mechanical Contractor shall supply all labour, materials, equipment and engineering services, and perform all works necessary to install the complete, tested, commissioned, and operational mechanical systems in accordance with the Specification and Drawings.

The contractor shall include all labour, materials, import charges and transport which maybe required for and in the construction of works detailed in the Specification and as shown on drawings, and shall provide at this own expense for all necessary power, plant, tackle, machinery, tools, apparatus, instruments, scaffolding, ladders, hoists, fencing and other equipment for the workmen and for the erection, testing, demonstration and commissioning of the complete plant in the manner described, together with the carriage thereof to the spot where they are required to be used and their subsequent removal.

The necessary builders work, associated in making and forming of opes in the structure, and reinstatement works to match the existing will be carried out by this contractor as part of the works.

The necessary site trenching and re-instatement shall be allowed for as detailed for the new gas service.

03. Site Conditions:

This Contractor is strongly advised to visit the site and ascertain the facilities of access thereto, the supply of labour and materials the district will afford and general convenience of working. He shall be taken to have made himself acquainted with the nature of the works; the site and all existing buildings and all other things insofar as they may have any connection with or effect the works.

All the above matters must be taken into account when tendering and no charge for any extra labour or materials will be allowed in consequence of this Contractors failure to do this.

The Contractor must notify the project Engineer immediately should site conditions alter significantly from those as stated in the tender documents.

05. Contract:

The works proposed shall be executed as a main contract between the successful tenderer and the employer. The Main Contract Form shall be the current version of the Short Public Works Contract reference PW-CF6 as published by the Department of Finance.

Submission of a tender shall be taken as acceptance of the proposed contract form.

06. Tender Acceptance

The client does not bind themselves to accept the lowest or any tender. Acceptance of any tender will be subject to compliance with the Pre-Contract Procedures including production of the Contractors current insurances, tax clearance certificate, safety statement etc.

07. Tender Drawings

The design drawings issued within the tender package must be read in conjunction with all relevant project specifications. If the contractor has any queries regarding design drawings issued prior to tendering they shall notify this office immediately. It shall be otherwise deemed that the contractor has understood and priced for all works as designed.

08. Tender Returns:

The Mechanical Contractor shall be deemed, before tendering, to have made a thorough examination of the Drawings, Specifications, Conditions of Contract, the Site and other things affecting the proposed works to ascertain precisely the nature and extent of same and the conditions under which the proposed works will have to be executed. The Tenderer must complete the tender return / pricing pages accompanying this specification document, in full, where each elemental item is to be priced for separately.

09. Payment:

The Contractor must submit Progress Statements for each Claim and Interim Certificate Amounts may be at the Engineer's Discretion.

10. Works Programme:

The works are expected to be carried out and fully completed and certified during Q4 2026. The contractor is expected to commence works in October with a 4 week timeline to completion and handover.

The programme shall allow for phased working within an operational school, agreed service shutdowns and out-of-hours working where required.

A competent Site Foreman shall be assigned to the project throughout the works. The Contractor shall attend progress meetings when requested and maintain the programme to reflect actual progress.

No variation shall be undertaken without prior written instruction from the Employer's Representative.

11. Guarantees and Warranties

All manufacturers guarantees and warranties on plant, equipment, etc., shall be valid up to the end of the Defects Liability Period.

12. Defects Liability Period:

All manufacturers guarantees and warranties on plant, equipment, etc., shall be valid up to the end of the Defects Liability Period. Refer to the Conditions of Tendering in the Main Contract Document.

13. Samples / Materials And Products:

The Mechanical Contractor shall issue details of all specified equipment and plant for approval prior to placing order. All equipment and plant shall be approved on site by the engineer prior to installation. Such approval shall not relieve the Contractor from responsibility for making good any defects which may arise as a consequence of failure or otherwise of any materials during the contract period.

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

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

14. CE Marking

All electrical equipment, systems supplied and installed shall conform to the appropriate EU Directives and shall carry the applicable CE Marking.

15. Builders Work:

Builders work in the cutting of holes, and re-instatement to match existing, including making good, painting affected areas complete to match existing etc, for the specified services will be carried out by this contractor, as part of the works.

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

The site trenching for the new gas service and re-instatement of the ground shall be allowed for.

16. Supervision:

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

17. Security:

All personnel working on or attending site are required to have valid photo identification (Safepass). The Contractor shall not impede or interfere with the Security Systems and procedures in use by 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.

18. Labour:

The Mechanical Contractor shall ensure that all employees are registered for PAYE / PRSI and that all employees have successfully completed a SafePass course. Only fully qualified and competent tradesmen, together with their necessary labourers, or helpers, shall be employed by the Contractor on the works, which shall be carried out and completed in the best substantial manner.

19. Site Establishment:

This Contractor shall include for site establishment, space will be provided to accommodate same. Temporary water, sanitary services, and power will be made available. Electricity costs used by this Contractor will have to be paid by him.

20. Protection of Existing Services:

When stripping out redundant services the Contractor shall ensure that no unnecessary damage is caused to either the equipment and/or the building fabric which is to be retained. The Mechanical Contractor shall make good, at his own expense any damage caused whatsoever to existing services to the complete satisfaction of and in accordance with the instructions of the Engineer/Statutory Authority concerned, and shall keep the Client indemnified at all times from claims in connection with the damage.

21. Electricity Supply:

The electricity supply to the school 380/220 Volts, 50 cycles, and all electrical plant and equipment must be suitable for this supply.

22. Wiring Details:

The General rules for wiring of supplies of Electrical Energy, as laid down by the Electro Technical Council of Ireland, National Rules for Electrical Installations, 5th Edition IS 10101:2020, together with the regulation laid down by the E.S.B., shall be strictly adhered to, as shall the requirements of the 18th Edition of the I.E.E. Rules and Regulations.

23. Trade Names

Any reference to Trade names shall be for the purpose of describing the Specification standard of the article or material to be used and it does not imply that the specified trade name solely must be used.

24. Inspection Prior to Concealment

Where work requiring inspection or testing is subsequently to be concealed, due notice shall be given to the Project Engineer to accommodate necessary inspection and witnessing of testing where required before concealment. Failure to give due notice, of at least 48 hours, shall necessitate the Contractor uncovering the work and reinstating at their own expense.

The Engineer reserves the right to forego its inspection; however this will in no way relieve the Contractor's responsibility to comply with the specification and drawings. All work that is not installed to the required standard or does not demonstrate adequate co-ordination with the building and other services must be removed and re-installed in full compliance with the tender documentation and relevant standards at the Contractor's cost and without any associated increase in the project program

25. Tests/Commissioning On Completion:

The Contractor shall inspect, test, purge, commission and certify the complete LPG, electrical and gas-safety installations in accordance with the applicable standards, manufacturers' requirements and this Specification. The Contractor shall provide at least seven days' notice of formal testing and commissioning to allow attendance by the Employer's Representative.

Testing shall include:

- LPG pipework strength and tightness testing.
- Regulator operation and downstream pressure verification.
- Operation of all master and local proving valves.
- Functional testing of LPG and carbon monoxide detectors.
- Operation of all emergency gas knock-off points.
- Fire-alarm interface and automatic gas isolation.
- Electrical testing and certification.

All test records, commissioning sheets and certificates shall be included within the operating and maintenance manuals

26. Making Good Damage:

The Contractor shall inspect all equipment and materials on arrival on site for defects or any failure to meet the specification and shall replace any defective equipment or materials as necessary. The Contractor shall take all necessary precautions to ensure that there is no damage or defacements caused by their employees or representatives to the furniture, fittings or other equipment within the buildings or to the premises themselves or to adjoining premises, and shall make good at their own expense any damage caused to the premises or its contents during the works, to the entire satisfaction of the Employer's Representative.

27. Instruction:

This Contractor shall liaise with the Project Engineer in providing for instructing the Employer in the operation of the new heating installation on completion of the installation works. He shall provide two sets of record drawings, for the installed systems and full operating and maintenance manuals.

28. Drawings:

Copies of drawings of the building are issued with the Specification. Dimensions and other information shown on the drawings forming part of the Contract are believed to be correct, but no responsibility for same is accepted. 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.

This Contractor should note that, prior to finally positioning equipment, these must be agreed with the Engineer. The Contractor shall be responsible for the setting out of the work and he shall rectify any errors he may make, either in setting out the work or during its progress.

The Contractor shall not deviate in the execution of the work from the Specification or Drawings herein referred to, except upon written order signed by the Employers Representative authorising such deviation.

The Mechanical Contractor shall keep on site a full set of the Construction Drawings, on which he shall record and note the actual layout of all the piped services installations as installed, including routes. The Contractor shall include for the preparation of final marked-up drawings, at practical completion stage.

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.

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

29. Maintenance:

The works shall be maintained by the Contractor in perfect condition for 12 months after the issue of the Engineers certificate of practical completion and any work or material exhibiting defects during that period shall be made good by the Contractor at his own expense.

30. Tax Clearance Certificate & C.I.F. Pension/Sick Pay Scheme:

It will be a condition for the award of the Contract that the firm being considered must be able to produce, within seven days of being requested to do so, a Tax Clearance Certificate from the Collector General of Taxes, Sarsfield House, Limerick and provide evidence of Membership of the Construction Industry Federation (C.I.F.) Pension/Sick Pay Scheme.

31. Insurances:

The Contractor shall comply with the requirements of Clause 10 of the “Short Public Works Contract” relating to Insurance and Compensation. He shall effect adequate insurance in his own name and also in the name of the Employer to cover all the risks or claims specified in the aforesaid “Short Public Works Contract” and shall hold the Employer indemnified against all such claims and risk in anyway arising out of the works included in the Contract. The minimum sum for public liability insurance shall be €6,500,000.00 (six million, five hundred thousand euro) for any single claim, including employer’s liability of €13,000,000.00 (thirteen million euro) and including all risks as stated in the attached “Tender and Schedule”.

CONTRACT SAFETY AND HEALTH PROCEDURES:

B1. BASIC LEGAL REQUIREMENTS:

Contractors must comply with the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021 and any other statutory provisions and common law duties. Steps must be taken to ensure the provision of adequate and suitable plant and equipment.

Only those Contractors and Employees having appropriate training and experience should be allowed work, on the premises. The Contractor shall appoint a Project Supervisor as required by the Site Health and Safety Regulations.

B2. SAFETY COMMUNICATION:

The Contractor is required to ensure that all the Employees, Sub-Contractors and all their Employees, whilst on the Company premises are informed of the Health and Safety Rules and Procedures.

B3. PERIOD OF WORK:

The Contractor must notify the Project Co-ordinator in an appropriate way before commencing and on completion of their task. Prior application must be made for any work to be undertaken outside of normal office hours.

If work is to be phased, the method of phasing the work is to be prepared, agreed and distributed to all parties.

B4. VEHICLES:

Vehicles used by Contractors or their Employees are allowed on the Companies premises for delivery, parking or collection subject to local instructions. All drivers are requested to exercise maximum care when on Company premises and particularly when Employees or Members of the Public are entering or leaving.

Drivers of large vehicles operating in confined circumstances must ensure there is a person in attendance to assist with reversing etc.

B5. DELIVERY AND DEPOSIT OF MATERIALS AND GOODS:

No materials, goods or equipment shall be stored in Plant Rooms or placed so as to obstruct general work areas, gangways or fire exit routes.

All rubbish especially dangerous or flammable materials must be removed from the premises daily.

B6. CONTRACTORS WORK AREA:

The Contractor must keep locked, the doors to flat roofs with unprotected edges, plant rooms and electrical apparatus, unless in attendance. Where possible, the Contractor's work should be clearly defined and physically separated from all parts of the premises. The area may be marked by a temporary partition or tape backed up with warning signs.

The segregated area will become the responsibility of the Contractor. Visitors to Contractor's work must be accompanied by Contractors representative. Under no circumstances should portable or temporary methods of heating be introduced to the Contractors Area, without prior written authorisation.

B7. RAISED SURFACES, HOLES AND PROJECTIONS:

Raised surfaces, holes, trailing leads or surface and projecting equipment must not be left at any time without taking the necessary safety precautions. All opening must be securely fenced or covered over and marked with warning notices. Loose materials of whatever kind must not be left about or allowed to obstruct the roadway, gangways or working area.

B8. FIRE EQUIPMENT:

The removal or obstruction of Fire Extinguishing Equipment from its original location is prohibited. A Contractor is responsible for providing and maintaining any specialised fire extinguishers and equipment for the work in progress.

B9. EVACUATION OF BUILDING:

The contractor must read Fire Instructions displayed on the premises and comply in the event of an emergency evacuation. He/she is not to eliminate or diminish exists during alterations.

B10. EXISTING SERVICES:

It is the Contractors responsibility to ascertain the existence and whereabouts of electrical cables, drains, air, gas, and water mains. The Contractor must familiarise himself/herself and how to operate the main and/or local isolation points for services before starting work and in anticipation of an emergency.

B11. PLANT, TOOLS, AND EQUIPMENT:

All plant, tools and equipment brought onto the Company's premises should be of safe design and in a safe condition. Particular attention must be given to checking the electrical and mechanical integrity of any hired equipment. Earth leakage circuit breakers should be fitted on all 220 volt cables. Equipment operating at 110 volts is preferable.

B12. SAFEGUARDING OF MACHINERY:

All machines such as circular saw tables and pipe threaders must be guarded in accordance with statutory requirements.

B13. SAFETY STATEMENT:

Contractors are required to have safety statements available for inspection by the Clients H.S. and W. offices. They are also required to prepare method statements when undertaking tasks requiring special skills or technology.

B14. PORTABLE ACCESS EQUIPMENT:

Where ladders, step-ladders and trestles are necessary, they must be used in a safe manner for work to be done. Ladders should be securely tied at the top or held by a person at the bottom unless they incorporate suitable safety devices. The equipment should be of suitable construction and free from defect. Equipment and materials must be carefully moved and not thrown or dropped from a height.

B15. WARNING OF DANGER:

Care must be taken, at all times to protect the Client's employees and members of the public from danger and to protect property and work in progress from damage.

Any circumstances which give rise to such danger or damage must be reported immediately.

B16. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING:

All Contractors employees must be issued with, and make full use of, all such protective equipment or clothing, as required by statute or any regulations made thereunder. They must also meet any locally agreed requirements for protecting the employee, e.g., for the use of safety helmets and protective footwear.

B17. ACCIDENTS:

In addition to the statutory obligations for Contractors to report dangerous occurrences and accidents to the appropriate authority, all accidents must be reported to the safety co-ordinator of the Clients.

B18. HOT WORK:

In the event of the Contractor carrying out any of the following works he must carry the appropriate insurance and also comply with all the procedures and safety precautions set out in this insurances:

- ☐ All activities involving flame.
- ☐ Hot air or arch welding and cutting equipment.
- ☐ Braising and soldering equipment and blow lamps.
- ☐ Bitumen boilers and other equipment producing heat or having naked flame.

B19. SAFETY, HEALTH, WELFARE & ENVIRONMENTAL ISSUES

This Contractor shall comply fully with all statutory safety, health and welfare regulations regarding work people, including those employed by Sub-Contractors employed on the site and particularly the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021 and provide all relevant details to the Main Contractor to carry out the function of Safety Planning Supervisor for the construction phase of the works.

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

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

This Contractor shall include for complying with the Safety, Health and Welfare at Work Acts and Regulations current at the date of tender.

The Main Contractor shall be appointed by the Client under a collateral agreement to the main contract as Project Supervisor for the Construction Stage in respect of the project pursuant to the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021. This Contractor shall include all costs for the provision of the necessary services and details to the Main Contractor to perform his duties as Project Supervisor for the Construction Stage pursuant to Regulations 6 and 7 of the Regulations.

This Contractor shall include for providing all necessary information as requested by the Project Supervisor for the Construction Stage to enable the preparation and completion of the Safety File including record drawings, specifications, maintenance and operating manuals and commissioning certificates. The record drawings and Maintenance Manuals shall be as required under previous clauses of this document.

SECTION 2: SPECIFICATION PARTICULARS:

ELEMENT (50) : SITE SERVICES

50.1 Extent And Programme Of Works

This Element comprises the complete external LPG storage and distribution installation indicated on the drawings, including the underground LPG pipework between the cylinder storage installation and the second-stage regulators, together with all associated external above-ground pipework, valves, fittings, regulation equipment and connections.

The Contractor shall coordinate the works with the LPG supplier, associated builders' works and internal LPG installations. The programme shall minimise the duration of open excavations and maintain safe access throughout the works.

The underground LPG pipework shall be pressure tested at 3.5 bar gauge for a minimum period of two hours, subject to confirmation that the proposed pipework and all components are rated for the test pressure. The test shall be witnessed by the Employer's Representative and recorded within the handover documentation.

The remainder of the installation shall be tested in accordance with I.S. 820, the LPG supplier's requirements and the equipment manufacturers' instructions.

50.2 Existing LPG Installation

The Contractor shall coordinate with the LPG supplier and provide for the isolation, purging, disconnection and removal of the existing external LPG installation indicated on the drawings.

Existing pipework shall be verified gas-free before cutting or removal. Redundant pipework that cannot be removed shall be purged, disconnected, permanently capped and clearly identified. All redundant equipment and materials shall be removed from site and disposed of through an authorised waste facility.

50.3 LPG Cylinder Storage and Regulation

Supply and install the complete four-cylinder LPG storage and manifold system, including cylinder connections, flexible hoses, manifold pipework, changeover equipment, regulators, gauges, isolation valves, fittings and all associated ancillary equipment.

Provide the lockable, naturally ventilated galvanised mild-steel powder-coated enclosure indicated on the drawings, complete with hinged access doors, secure locking arrangements, supports, fixings and permanent safety signage.

The regulator and changeover equipment shall be suitable for LPG service, the connected load and the applicable inlet and outlet pressures. Final equipment selections shall be coordinated with the LPG supplier and submitted for approval before installation.

50.4 External LPG Pipework

Supply and install all underground and external above-ground LPG pipework in the sizes and along the routes indicated on the drawings. Underground pipework shall be specifically approved for buried LPG service and shall include tracer wire, marker tape and permanent identification. Pipework shall not be backfilled until it has been inspected and tested.

Trench excavation, sand bedding, cover, backfilling and reinstatement are included under the associated builders' works.

External above-ground pipework shall be adequately supported and protected against corrosion, impact, weather exposure and unauthorised interference.

50.5 Master LPG Proving Valve and Identification

Supply and install the master LPG proving valve and associated isolation equipment indicated on the drawings.

The valve shall be suitable for LPG service and shall fail safe to the closed position upon loss of power, fire-alarm activation or operation of the associated emergency controls.

Provide corrosion protection and painting to all exposed LPG pipework and supports. Pipework, valves, regulators and isolation points shall be permanently identified, complete with direction-of-flow markers, warning notices and emergency signage.

50.6 Testing, Commissioning and Certification

The underground LPG pipework shall be pressure tested at 3.5 bar gauge for a minimum period of two hours, subject to confirmation that the pipework and all connected components are suitable for the test pressure.

The test shall be completed using calibrated instruments, witnessed by the Employer's Representative and recorded within the handover documentation.

The complete external LPG installation shall also be tightness tested, purged, commissioned and certified in accordance with I.S. 820, the LPG supplier's requirements and the manufacturers' instructions.

Commissioning shall include verification of pipework integrity, regulator pressures, cylinder changeover, isolation valves and master proving-valve operation. All test results, certificates and commissioning records shall be included within the operating and maintenance manuals and Safety File.

ELEMENT (54) : GAS SERVICES

54.1 Extent of Works

This Element comprises the complete internal LPG distribution and gas-safety installations indicated on the drawings, including:

- Removal of the existing internal LPG installation.
- Internal LPG distribution pipework, fittings, valves and supports.
- LPG services to the science, home economics and metalwork classrooms.
- Classroom gas taps and appliance connections.
- Master and local gas proving panels and valves.
- Emergency gas knock-off points.
- LPG and carbon monoxide detectors.
- Associated controls and electrical interface requirements.
- Painting, identification, testing, commissioning and certification.

The installation shall include all equipment and ancillary components required to provide a complete, compliant and operational LPG installation.

54.2 Disconnection and Removal

The Contractor shall isolate, purge, disconnect and remove the existing internal LPG pipework, gas taps, valves and associated equipment indicated on the drawings.

Existing pipework shall be verified gas-free before cutting or removal. Redundant pipework that cannot be removed shall be purged, permanently capped and clearly identified.

The Contractor shall inspect the existing installation before tendering and include for its complete removal within the affected areas.

54.3 Pipework and Supports

Internal LPG pipework shall be medium-grade carbon-steel tube complying with I.S. EN 10255, complete with fittings and jointing methods suitable for LPG service and installed in accordance with I.S. 820.

Copper pipework may only be used for final connections below benches and in the sizes indicated on the drawings. Copper tube shall comply with I.S. EN 1057 and shall be installed with LPG-compatible fittings.

Pipework shall be installed neatly along the routes indicated, with the minimum number of joints. Concealed joints shall not be permitted unless specifically approved.

Provide purpose-made metallic pipe supports, brackets and fixings at suitable centres. Supports shall prevent movement, sagging and contact between the pipework and the building fabric.

54.4 Valves, Gas Taps and Appliance Connections

Isolation and proving valves shall be specifically approved for LPG service and suitable for the applicable pressure and pipe size. Valves shall be accessible, clearly labelled and arranged to permit safe isolation and maintenance.

Supply and install all classroom gas taps and appliance connections indicated on the drawings. Laboratory and home economics outlets shall be as specified or approved equivalent, selected to suit the required application, including:

- Four-way bench outlets.
- Double bench outlets.
- Remote-unit valves.
- Fume-cupboard outlets.

Final outlet locations shall be coordinated with the existing benches, appliances and teaching-room layouts before installation.

54.5 Gas Proving and Emergency Isolation Systems

Supply and install the master and local gas proving systems indicated on the drawings, complete with control panels, proving valves, pressure-sensing equipment, key switches, visual indicators, audible alarms and emergency gas knock-off points.

Each system shall automatically prove the integrity of the downstream installation before opening the gas valve. The gas supply shall remain isolated where a leak is detected, an appliance valve is open or the proving sequence is unsuccessful. All proving valves shall fail safe to the closed position upon:

- Loss of electrical power.
- Operation of an emergency gas knock-off point.
- Detection of an LPG or carbon monoxide alarm.
- Activation of the associated fire-alarm interface.

The master gas proving panel shall incorporate the seven-day time-clock control and shall be located as indicated on the drawings.

54.6 LPG and Carbon Monoxide Detection

Supply and install all LPG and carbon monoxide detectors indicated on the drawings, complete with control equipment and connections to the associated gas proving systems. LPG detectors shall be installed at low level adjacent to the relevant appliances. Carbon monoxide detectors shall be installed in accordance with the manufacturers' requirements. Final positions shall be coordinated on site and shall avoid obstruction, dead zones and locations susceptible to damage.

Detector operation shall automatically isolate the applicable LPG supply and generate the required audible and visual alarm.

54.7 Testing, Commissioning and Certification

The internal LPG pipework shall be strength tested at 3.5 bar gauge for a minimum period of two hours, with all equipment not rated for the test pressure disconnected or isolated.

Following the strength test, the complete installation shall be tightness tested, purged and commissioned in accordance with I.S. 820, the LPG supplier's requirements and the manufacturers' instructions.

The final operating pressure shall be set to suit the LPG supplier's requirements and the connected appliances.

Commissioning shall include verification of:

- Pipework integrity and operating pressures.
- Gas taps and appliance connections.
- Master and local proving sequences.
- Proving-valve operation.
- Emergency gas knock-off points.
- LPG and carbon monoxide detectors.
- Loss-of-power isolation.
- Fire-alarm interface and automatic gas isolation.

A Declaration of Conformance and all applicable test and commissioning certificates shall be provided and included within the handover documentation.

54.8 Painting and Identification

All exposed carbon-steel LPG pipework, fittings and supports shall be cleaned, prepared and painted with a suitable corrosion-protection system, finished yellow ochre.

Pipework identification shall comply with the applicable requirements of BS 1710. Provide permanent labels to all valves, proving panels, emergency controls, detectors and isolation points.

ELECTRICAL SERVICES

01 Scope of Works

The Contractor shall provide all associated electrical works required for the complete LPG and gas-safety installations, including:

- Isolation, disconnection and removal of obsolete electrical services associated with the existing LPG installation.
- Extension of the existing electrical distribution system, including protective devices and final circuits.
- Power and control wiring to the master and local gas proving panels and proving valves.
- Cabling and connections to the LPG detectors, carbon monoxide detectors and emergency gas knock-off points.
- Wiring and connections associated with the integral seven-day time-clock control.
- Dedicated galvanised steel conduit and trunking for all gas-safety wiring.
- Earthing and bonding of the complete installation.
- Interface between the master gas proving panel and the existing fire-alarm system, including the required input/output equipment.
- Maintenance of the existing electrical and fire-alarm services throughout the works.
- Testing, commissioning and certification of the complete electrical installation and fire-alarm interface.

Activation of the fire-alarm system shall automatically close the master LPG proving valve. The complete cause-and-effect sequence shall be tested and witnessed before handover.

Electrical installations shall comply with the current edition of I.S. 10101 and the equipment manufacturers' requirements.

The Mechanical Contractor shall employ a Registered Electrical Contractor to complete the electrical works and a competent fire-alarm specialist to complete the fire-alarm interface. Details of the proposed specialist contractors shall be submitted to the Employer's Representative before commencement.

BUILDER WORKS

01. Scope of Works

This Element comprises all builders' works associated with the LPG upgrade, including:

- Trenching for the underground LPG pipework, providing a minimum cover of 450 mm above the pipework.
- Sand bedding and cover, backfilling, compaction and reinstatement of disturbed ground to match the existing finishes.
- Concrete base and fixings for the LPG cylinder storage enclosure.
- Formation and core drilling of openings required for LPG pipework, electrical containment and associated services.
- Provision of sleeves, weather sealing and making good to all internal and external penetrations.
- Tested fire-stopping to penetrations through fire-rated walls, floors and compartments.
- Making good and painting of affected walls, floors and ceilings to match the existing finishes.
- Removal of debris and redundant materials and final cleaning of all affected areas.

Schedule of Emergency Gas Shut Off/Gas Proving System Equipment

The equipment provided for the above emergency isolation and gas proving system shall provide automatic proving and isolation of the systems complete. The gas proving systems will consist of wall mounted control panels and self contained actuator/pressure sensing unit. The actuator unit is to be fitted into the main gas supply and no inter valve pipework is to be provided. This system shall incorporate the following features:

Fire alarm interface
BMS interface

The panel shall include emergency stop buttons and remote emergency stop interface.

The respective valve outputs from the PCB shall be so arranged to drive gas valve at a supply voltage of normally 220 volts ac 50 hz. The output is to be relayed by contacts to the side of the gas supply valve. The necessary pressure switch input which is low voltage and operates on 24 volts. The remote emergency lock stop will also be provided for the complete installation which shall be interfaced with the PECB.

This system shall be completed in all respects to include testing, commissioning on completion. These specified details for the said equipment shall include:

Supply voltage 220 volt ac 50 hz, control outputs (gas valve), 2 24 volts ac 5 amp.

Control inputs, pressure sensor 34 volt dc active open.

Remote stop switches, 24 volt dc active open in terminals as required.

Fire alarm interface activate open.

Sensor/sniffer inputs, 24 volt dc active open.

Pressure switches shall operate 24 volt dc active open.

The following systems shall be provided:

Schedule of Gas Detection Systems and Associated Controls

Item Description:	Size:	Comment:
Master control gas proving valve	50 mm da.	This valve positioned, as shown. This system to include for control panel. Panel located in Principal's office.
Localised control valves with rooms to include; • Science rooms • Preparation areas • Home Economics • Metal Work	Line size, as shown on drawing.	Each system to include for control panel and remote emergency lock stops complete - see particular specification for details.

Control panels associated with main solenoid system to have volt free contracts for interfacing with fire alarm syste