

Mechanical Specification

Marillac Housing Association – 8 Willmount Estate, Janesboro, Limerick, V94NC5X

Description	Project Details
Project Title	Accessible Dwelling Adaptation & Extension Works, 8 Willmount Estate
Document Title	Mechanical Specification
Document Number	25-017
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Lead Consultant / Employer's Representative	DMA Architects, the Employer's Representative
Client Authority	Marillac Housing Association

Revision History and Approvals

Rev	Description	Origin	By	Date Checked	Checked By	Date Approved	Approved By	Date
T1	Issued for Tender	DMA	AK					

Project Holds

Section	Hold Detail	Action Party
Section 4.2	Confirmation of the existing gas-fired boiler's make, model, rated output and condition, and its suitability for relocation and re-plumbing	Mechanical Contractor
Section 4.2	Confirmation of the location and capacity of the new hot water cylinder	DMA Architects / Mechanical Contractor
Section 4.4	Verification of existing incoming water main pressure, flow rate and meter location	Mechanical Contractor

1 Scope of Works

1.1 Form of Contract

The contract conditions are as outlined in this document. In this contract, the Mechanical Contractor shall act as a domestic sub-contractor to the Main Contractor, and all works shall be carried out in accordance with this specification and associated drawings. The works comprise the complete Mechanical Services Installation for 8 Willmount Estate, Janesboro, Limerick – Marillac Housing Association.

1.2 Nature of Contract

The Mechanical tenderer will act as a Domestic Sub-Contractor under the Main Contractor yet to be appointed under the contract. The contract shall be determined by the Project Quantity Surveyor.

1.3 Main Contract Conditions

The following conditions shall apply to this contract:

Public Liability Insurance policies are to be maintained until the issue of the Certificate of Final Completion of the works by the Employer's Representative under this Contract.

Before the work commences on the site, the Mechanical Contractor will be required to produce a letter in clear terms from his insurance company or brokers to the effect that they are insured in accordance with the terms of this Contract.

In the event of the Mechanical Contractor's failure to satisfy the Employer that he is so insured, the Employer will immediately operate the remedies provided within the terms of this contract.

1.4 Definitions

The contractual parties, consulting authorities, and representative bodies are defined as follows:

- **Employer's Representative:** Shall mean DMA Architects, who also perform the role of Lead Consultant, Architectural Designer, and Assigned Certifier.
- **Lead Consultant:** Shall mean DMA Architects, responsible for the coordination of structural, civil, mechanical, electrical, and plumbing works.
- **Main Contractor or Building Contractor:** Shall mean the firm appointed to carry out the Building and Civil works.
- **Electrical Contractor:** Shall mean the firm appointed to carry out the Electrical services installations.
- **Mechanical Contractor:** Shall mean the firm appointed to carry out the Mechanical services installations, above-ground drainage, and space heating as contained in this Specification and the Contract Drawings.

- **Contract Documents:** Shall mean the Form of Contract, this Specification and Conditions, the Form of Tender, the drawings relating to the work, and the letter accepting the Tender.
- **Approved, Directed, and Selected:** Shall mean the approval of, or considered necessary, equal, or required by DMA Architects, the Employer's Representative.
- **Supply and Provide:** Shall, unless otherwise stated, include both supply and fixing on site.

Representative Role	Project Party	Address and Contact Information
Client / Employer	Marillac Housing Association	Unit 9a, Plato Business Park, Damastown Rd, Parslickstown, Dublin 15
Architect / Employer's Representative	DMA Architects	Tralee, Co. Kerry (RIAI Registered)
Services Design Coordination	DMA Architects, the Employer's Representative	Tralee, Co. Kerry (RIAI Registered)

1.5 Description of Site

The site is located at 8 Willmount Estate, Janesboro, Limerick, V94NC5X. The property is an existing semi-detached dwelling, attached to the adjoining property, within an established residential estate. The site area and boundaries are as shown on Drawing TD110. The property is bound by the adjoining semi-detached dwelling and neighbouring residential plots, presenting spatial constraints that must be accounted for during the routing of both external site services and internal services.

1.6 Description of Works

The works comprise the adaptation and extension of an existing semi-detached dwelling to provide an accessible community residential unit.

The existing dwelling is to be retained, with internal alterations, fire-safety upgrades and accessibility works as described in the Schedule of Works. A new single-storey rear extension of approximately 40 m² is to be constructed, connected directly to the existing dwelling, to accommodate an additional bedroom, an accessible W.C./wet room and a utility room. The existing dwelling and the proposed extension together comprise the completed development, with a combined floor area of approximately 161 m².

Contractually, the works include:

- Retention of the existing dwelling, with fire-safety, services and accessibility adaptation works.
- Construction of a new rear extension, structurally and functionally connected to the existing dwelling, with mechanical services extended from the existing system to serve it.

The dwelling must be fully accessible and compliant with Part M of the Technical Guidance Documents to support the community residential use. Due to the communal nature of the occupancy, the building services must be integrated with an automatic fire alarm system designed to an L1 standard in accordance with HIQA requirements.

1.7 Description of Installation

The mechanical installation comprises the retention, survey, relocation and re-plumbing of the existing gas-fired boiler, extension of the low-temperature radiator heating system to serve the new Extension, a new indirect hot water cylinder, pressurised mains-fed hot and cold water distribution, uPVC above-ground soils and wastes, and individual humidity-sensitive mechanical extract ventilation to all wet rooms and the utility room.

The existing gas-fired boiler is to be retained; no new boiler is required. The Mechanical Contractor shall survey the existing appliance, disconnect, relocate and re-plumb it as necessary to accommodate the new hot water cylinder and the revised pipework layout, and shall extend the heating circuit to serve the new radiators in the Extension. All gas works shall be carried out by a Registered Gas Installer (RGI) in full compliance with current gas safety and Building Regulations requirements. The heating strategy is designed to deliver reliable, efficient space heating and domestic hot water for the community dwelling, making best use of the retained appliance.

1.8 List of Drawings

All mechanical services layouts, piping schematics, ventilation details, and site service configurations are issued as a separate package by DMA Architects, the Employer's Representative. The Mechanical Contractor shall maintain an updated register of the latest revisions of all architectural, structural, and services drawings prior to completing the rough-in stage.

1.9 Tender Documents

The Tender documents comprise the documents listed in the 'Schedule of Tender Documents'. The Tenderer is requested to check the documents and the number of each page. If any pages are missing, duplicated, or indistinct, the Tenderer must notify DMA Architects, the Employer's Representative, immediately. No subsequent claim for loss consequent upon the Tenderer's failure to comply with this Clause will be entertained.

1.10 Materials

At the commencement of the works, the Mechanical Contractor shall confirm that deliveries of all materials can meet the construction programme requirements. On claiming an increase in material costs, he shall produce satisfactory proof of such variation, the acceptance of which shall be at the discretion of DMA Architects, the Employer's Representative.

In the case of imported materials, costs shall be stated in Euros, and the currency exchange rate at the tender date shall be stated in the tender return. All materials and mechanical equipment must be CE and UKCA certified, carrying appropriate declaration of performance documentation.

1.11 Labour

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

1.12 Tender Price

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

1.13 Value Added Tax

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

1.14 Delivery of Tenders

Tenders shall be returned to the Client, Marillac Housing Association, in the manner and at the time stated on the formal tender invitation.

2 General Clauses

2.1 Site Visit

The Mechanical Contractor, prior to submitting his tender, is recommended to visit the site at 8 Willmount Estate, Janesboro, Limerick and ascertain for himself the means of access, the structural challenges of the refurbishment and extension, and any other physical factors which may affect his tender, as no claim will be allowed on account of his not having done so.

2.2 Employer's Representative's Drawings

The Mechanical Contractor shall be deemed to have examined all drawings on the project (Mechanical, Electrical, Architectural, and Structural). No claim for additional payment shall be entertained arising from lack of information or spatial conflicts that could have been identified through cross-referencing the design packages.

2.3 Omissions and Anomalies

Should a tenderer find omissions or anomalies, a formal request for clarification should be made to DMA Architects, the Employer's Representative, prior to the tender return.

Such clarifications shall be confirmed in the form of a written Tender Addendum. Where anomalies between Drawings and Specifications do not come to light until the contract stage, the Mechanical Contractor shall provide the goods or perform the work to the higher standard as ruled by DMA Architects, the Employer's Representative.

2.4 Compliance with Specification

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

For his tender to receive consideration, the Tenderer shall complete in full the Schedule of Manufacturers and Suppliers section of this Specification. Subject to compliance with this Specification in respect of Standard Specifications, materials shall, where possible, be manufactured and assembled in Ireland.

The Mechanical Contractor shall, upon the request of DMA Architects, the Employer's Representative, furnish them with vouchers to prove that the materials comply with the requirements of the appropriate paragraph of this condition.

2.5 Quotation to be Inclusive

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

2.6 Specialist Equipment

It shall be the sole responsibility of the Mechanical Contractor to ensure that all special equipment conforms in every detail to all relevant clauses of this Specification. The Mechanical Contractor shall note that he is to inform Specialist Manufacturers and Suppliers of the full intent of the terms and conditions of this Contract and that they will be bound to these terms and conditions of contract, as will be the Sub-Contractors.

The Mechanical Contractor is advised to check all suppliers of specialist equipment that the radiators, hot water cylinder, extract ventilation fans, and ancillary equipment contained in their offer are in full accordance with the requirements of DMA Architects, the Employer's Representative.

2.7 Royalties

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

2.8 Sub-letting

The Mechanical Contractor shall not assign the Subcontract or sub-let any portion of the work without the written authority of DMA Architects, the Employer's Representative, except where sub-letting is expressly called for in this Specification. The Tenderer shall state in his tender return the names of all firms to whom he proposes to sub-let portions of the work, for the approval of DMA Architects, the Employer's Representative.

Approval of the sub-letting by DMA Architects, the Employer's Representative, and the Main Contractor shall not relieve the Mechanical Contractor of any of his obligations under this contract. The Mechanical Contractor shall be responsible for the programming and execution of all the work sub-let.

2.9 Bill of Quantities

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

The number of items and quantities shall be given and extended to form a Bill of Quantities adding up to the totals as indicated in the Tender Summary. The Bill of Quantities shall remain with DMA Architects, the Employer's Representative, until the works are completed and shall form the basis of agreement of variations by measurement. However, the contract is a lump-sum contract and is not subject to re-measurement. The tenderer is to submit a priced Bill of Quantities in accordance with ARM 4 Supplement 2 with his tender.

2.10 Contractor's Work Co-Ordination

Before any work is commenced on site, the Mechanical Contractor shall agree all pipe and duct routes necessary to complete the works, coordinating closely with the structural and electrical trades to ensure that services are integrated without compromising fire compartmentation or architectural finishes, and in particular at the junction between the existing dwelling and the new Extension.

2.11 Record and Working Drawings

When the installation is complete, the Mechanical Contractor shall supply a set of Record Drawings showing the layout of the installation as installed. Three sets of white prints, coloured to assist interpretation, together with a digital set on CD/USB shall be provided. Drawings shall be handed over to DMA Architects, the Employer's Representative, for checking and their approval obtained before final printing.

The information contained on the Mechanical Contractor's working drawings shall be incorporated on the Record Drawings. Additionally, a Maintenance Manual shall be provided by the Mechanical Contractor as specified.

2.12 Production of Record Drawings & Manuals

In the event of failure by the Mechanical Contractor to produce approved Record Drawings and Manuals, DMA Architects, the Employer's Representative, may deduct up to 1% of the Contract value to cover the costs of having the site surveyed and the record documents produced on behalf of the Client.

2.13 Labelling

The Mechanical Contractor shall be responsible for the clear labelling, identification, and circuitry charting of all mechanical plant, distribution manifolds, control panels, and valves.

2.14 Agreement of Programme

The programme for the works will be as outlined in the Project Quantity Surveyor data. The Mechanical Contractor will ensure that adequate resources are available at each stage of the programme to complete rough-in, second-fix, and commissioning works in alignment with the master building schedule.

2.15 Materials and Equipment Delivery Schedules

Once the Mechanical Contractor has been confirmed by the Main Contractor, the Mechanical Contractor shall submit a detailed material and equipment delivery schedule, confirming lead times and arrival dates for the hot water cylinder, radiators, and major control components.

2.16 Co-ordination

The Mechanical Contractor shall familiarise himself with the details of the location and routes of other building services and shall coordinate his work with those services. Failure of the Mechanical Contractor to coordinate his works shall involve the Contractor re-arranging installed works to the satisfaction of DMA Architects, the Employer's Representative, and at the Contractor's expense. When preparing his tender, the Contractor shall inspect the drawings.

2.17 Maintenance

The work is to be maintained in good running order for a period of twelve months after the completion of the Contract, and after this period of twelve months, finally passed by DMA Architects, the Employer's Representative. Any defect developing in the system during this period shall be rectified and made good at the Mechanical Contractor's own expense, unless caused by factors outside the control of the Contractor.

In the event of the Contractor refusing to rectify defects within a reasonable period, DMA Architects, the Employer's Representative, shall have the power to have the work done by others and deduct the cost of such work from the Mechanical Contractor's account, without prejudice to any other claim which may arise out of the refusal of the Mechanical Contractor to make good the defects.

2.18 Contracts Manager & Foreman

The Contracts Manager or Foreman shall be approved by DMA Architects, the Employer's Representative, which approval may be at any time withdrawn, given sufficient reason. The Contracts Manager or the Foreman, whose name shall be set out in writing by the Contractor, shall be maintained constantly on the works, and he shall not be changed except with the written approval of DMA Architects, the Employer's Representative.

Such Contracts Manager shall be authorised on the Contractor's behalf to receive instructions from DMA Architects, the Employer's Representative, and shall give his whole time to the superintendence of the work. He shall keep accurate records and details of all installed works and shall furnish DMA Architects, the Employer's Representative, with all particulars demanded. The Contracts Manager and Foreman shall not be transferred off-site without the agreement of DMA Architects, the Employer's Representative.

2.19 Site Management & Staff

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

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

2.20 Materials and Workmanship

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

2.21 Trade Names

Where Trade Names are given, it is to be clearly understood that such references are inserted for the guidance of the Mechanical Contractor with respect to the nature and quality of the articles or services required. The Mechanical Contractor is free to offer alternatives, provided they comply in full with the Specification of the specified goods, subject to the written approval of DMA Architects, the Employer's Representative.

2.22 Setting Out

The position of all fittings, pipes, equipment, machinery, apparatus, etc., indicated on the drawings are approximate only, intended to indicate generally the arrangement of the works. The Mechanical Contractor shall be responsible for notifying DMA Architects, the Employer's Representative, of any discrepancy between the Specification, Schedules, and Drawings prior to starting works.

Should any portion of the works, which would reasonably and obviously be inferred as necessary for the complete, safe, and satisfactory operation of the installation as a whole, not be expressly described or specified, the Contractor shall provide and execute such works as part of the Contract and shall not be entitled to any extra payment on that account. The exact positions of all fittings, equipment, and apparatus, and all pipe routes, shall be verified by the Contractor on the site and approved by DMA Architects, the Employer's Representative, prior to installation.

2.23 Builders Work through Structure

Should it be required to cut, drill, or core any part of the structural elements, block or masonry walls, the Contractor shall obtain the written approval of DMA Architects, the Employer's Representative, before any such works are carried out. The Contractor shall include in his Tender for all drilling, cutting, and coring of structural elements where required, which shall be witnessed by DMA Architects, the Employer's Representative.

The Contractor is responsible for all builders' work necessary to complete the mechanical installations. Where pipe or duct routes penetrate existing fire compartments, the dwelling party wall, or floors, the Contractor shall seal them with a certified, proprietary fire-stopping system to maintain the fire integrity of the structure.

2.24 Compliance with Regulations

The Mechanical Contractor is to guarantee that his work will comply with all statutory regulations, including the Irish Building Regulations (specifically Parts B, E, F, G, H, L, and M), local authority bye-laws, Acts of Government, and utility requirements. No additional cost will be allowed after receipt of his tender for compliance with this Clause.

2.25 Clear Work Areas

The Mechanical Contractor shall at all times keep the site free from obstructions and rubbish and shall remove from the site all surplus materials and temporary works as soon as they are no longer required. Facilities for disposal of rubbish shall be coordinated with the Main Contractor. On completion of the works, the Contractor shall remove all surplus materials, benches, tools, and packaging, leaving the site in a clean and tidy condition to the satisfaction of DMA Architects, the Employer's Representative.

For the purpose of this Clause, the word 'site' shall be extended to include all adjacent roadways, paths, passageways, or other access routes by which the Contractor or his workmen obtain entry to or exit from the property.

2.26 Clear Access Routes

Corridors, paths, and the shared site access shall be kept clear of all mechanical materials and construction rubbish at all times when work is not in progress.

2.27 Safety, Health and Welfare at Work Act 2005

The attention of the Mechanical Contractor is directed to the statutory requirements of the Safety, Health and Welfare at Work Act 2005, and to the construction regulations made thereunder. The Contractor shall submit a project-specific Method Statement and Risk Assessment prior to commencing any works on-site.

2.28 Site Visits & Inspections

DMA Architects, the Employer's Representative, shall visit the site to inspect the mechanical works, and the Mechanical Contractor is advised to coordinate and resolve any design or coordination queries at these times.

2.29 Pre-tender Site Walk

Tenderers are strongly advised to attend the scheduled pre-tender site visit to familiarise themselves with the existing dwelling, the adjoining semi-detached property, access limitations, and physical constraints before submitting their proposals.

3 Mechanical Scope of Works

3.1 General Overview

This section establishes the specific performance, installation, and engineering criteria for the Mechanical Services serving the accessible dwelling adaptation and extension works at 8 Willmount Estate, Janesboro, Limerick.

The existing dwelling is to be retained. The mechanical systems must be adapted and extended to serve both the retained dwelling and the new rear Extension as a single, integrated installation, with the new Extension's services connected directly into the existing system rather than provided as a standalone installation.

The space heating strategy retains the existing gas-fired boiler, relocated and re-plumbed as necessary, feeding both the existing radiator circuit (adapted with new thermostatic control valves and heating controls) and a new radiator circuit to the Extension. Moisture control in wet rooms is managed through individual humidity-sensitive extraction fans, rather than a centralised ducted system.

3.2 Project Specific Requirements and Standards

Building Energy Rating (BER) and Part L Compliance

Energy efficiency is central to the services design. The complete mechanical services installation shall comply with the Building Regulations (specifically Technical Guidance Document Part L). The Contractor is to provide a BER certificate on completion of construction; the minimum acceptable BER rating for the completed dwelling is A2.

The retained gas-fired boiler, auxiliary circulators, and extract fans must comply with the specific fan power (SFP) and minimum seasonal efficiency limits outlined in the Part L guidelines, insofar as they apply to a retained existing appliance.

3.3 Codes, Standards and Design Guidelines

The mechanical installation shall comply with the latest editions of the following technical standards:

- **Technical Guidance Document B:** Fire Safety (including integration of services with an L1 automatic fire alarm system to HIQA standards).
- **Technical Guidance Document E:** Sound Transmission and Acoustic Insulation.
- **Technical Guidance Document F:** Ventilation (incorporating individual mechanical extract fans and background window trickle vents).
- **Technical Guidance Document G:** Hygiene and Hot Water Safety (including TMV3 anti-scald protection).
- **Technical Guidance Document H:** Drainage and Wastewater Disposal.
- **Technical Guidance Document L:** Conservation of Fuel and Energy (Part L energy efficiency standards for refurbishment).
- **Technical Guidance Document M:** Access and Use (providing fully accessible controls and fittings).

- **I.S. 813:** Domestic Gas Installations – all gas works to be carried out by a Registered Gas Installer (RGI).
- **HVCA DW/144:** Specification for Sheet Metal and Plastic Ducting Systems.
- **CIBSE Guidelines:** Relevant commissioning codes and design criteria.

3.4 Description of Systems

3.4.1 Heating System

Extent of Work

This section covers the retention, relocation, re-plumbing and adaptation of the existing gas-fired boiler and heating distribution, and the extension of the low-temperature hot water (LTHW) radiator circuit to serve the new Extension.

System Configuration

- **Heat Source:** 1 No. existing gas-fired boiler, retained. The Mechanical Contractor shall survey the existing appliance and, subject to the Project Hold at Section 4.2, relocate and re-plumb it as necessary to accommodate the new hot water cylinder and revised pipework layout.
- **Emitters:** Steel panel radiators (existing, retained, with new TRVs) in the existing dwelling, and new steel panel radiators (double panel, double convector as scheduled) in the Extension, installed in all habitable rooms and accessible bathrooms as indicated on the mechanical drawings.
- **Control:** New thermostatic radiator valves and heating controls throughout the existing dwelling, and a programmable room thermostat and time controller for the Extension, complete with zone valves where required, providing independent heating and domestic hot water scheduling.

Equipment

- 1 No. existing gas-fired boiler (retained, relocated and re-plumbed) – make, model and rated output to be confirmed by the Mechanical Contractor's survey prior to tender return, refer to Project Hold Section 4.2.
- Steel panel radiators (as scheduled on drawings), complete with TRV heads and lockshield valves.
- 1 No. new indirect hot water cylinder, complete with immersion heater backup and TMV3 assembly – capacity to be confirmed to suit the dwelling's occupancy, refer to Section 4.4.

3.4.2 Water Systems

Extent of Work

This section covers the incoming mains water supply to the dwelling, including all internal distribution pipework and the new indirect hot water cylinder. The water supply is mains-pressure, direct-fed; no cold water storage tank or booster pump is required.

The connection of the main utility water supply at 8 Willmount Estate shall be executed by the Main Contractor. The Mechanical Contractor shall be responsible for laying and connecting the underground MDPE barrier pipe from the metered position to the internal rising main of the dwelling.

Domestic Cold Water and Mains Drinking Water

- **System Configuration:** Pressurised cold water distribution fed directly from the mains rising main, with no intermediate storage tank, serving all sanitary fittings and the kitchen drinking water tap.
- **Control:** Stopcock and isolation valve at the point of entry, and localised isolation valves at all sanitary tap positions.

Domestic Hot Water

- **System Configuration:** Pressurised domestic hot water system supplied from a new indirect hot water cylinder, heated by the retained gas-fired boiler, serving the Accessible W.C. (RM-05), W.C. (RM-06), Utility Room (RM-04) and kitchen. An electric immersion heater shall be installed as a backup heat source.
- **Control:** Thermostatic mixing valves (TMV3) to prevent scalding at all accessible bath, shower and basin outlets, in accordance with TGD Part G and Part M.

Equipment

- 1 No. indirect hot water cylinder (Megaflo/Joule/Santon or approved equivalent), complete with factory-fitted immersion heater, pressure/temperature relief valve and expansion vessel. Capacity to be confirmed by the Mechanical Contractor to suit the dwelling's occupancy and outlet count.

3.4.3 Soils & Waste

This section comprises the supply, installation, and testing of all above-ground soils, wastes, and vent pipework connecting the internal sanitary fittings, kitchen sink, accessible W.C.s and utility room to the underground drainage upstands and the new foul inspection manhole. Underground drainage will be provided by the Main Contractor, and the Mechanical Contractor shall make the final connection to these points. Vertical Soil and Vent (S&V) stacks shall be routed through internal ducts and terminate with weathering slates above roof level.

System Configuration

- Gravity-fed, solvent-welded above-ground uPVC soils and wastes system with acoustic pipe wrapping in occupied zones.
- All vertical stacks vented to atmosphere above gutter line.

Control

- Deep-seal traps on all sanitary fittings to prevent sewer gas ingress.

Equipment

- uPVC waste pipework, solvent-weld fittings, and intumescent fire collars at all compartment floor and wall penetrations.

3.4.4 Ventilation System

Extent of Work

This section covers individual mechanical extract ventilation to all wet rooms and the utility room. Background ventilation is achieved via trickle vents in the windows. Continuous humidity-sensitive extract ventilation shall be provided from the Accessible W.C. (RM-05), W.C. (RM-06) and Utility Room (RM-04), each served by its own extraction fan ducted directly to atmosphere. No centralised ducted MVHR/cMEV system is required.

System Configuration

- Individual humidity-sensitive extraction fans, one per wet room, each with an integral back-draught shutter and ducted directly to an external wall or roof terminal.

Control

- Humidity sensing with boost function; motion-sensor boost to bathroom units, achieving minimum extract rates in accordance with Table 5.1 of TGD Part F.

Equipment

- 3 No. humidity-sensitive extraction fans (Vent-Axia or approved equivalent), to the Accessible W.C., W.C. and Utility Room.
- Adjustable wall or ceiling-mounted extract grille and external wall/roof terminal to each fan.

Where the short duct run from any extract fan penetrates the dwelling party wall or a fire-rated ceiling, the Contractor shall install a proprietary intumescent fire collar or damper, certified to a fire resistance rating equal to that of the penetrated structure (minimum 1-hour rating).

3.5 Mechanical Exclusions

The following works and components are excluded from the Mechanical Sub-contract, and shall be provided by others:

- Automatic motorized window actuators and associated controls.
- Below-ground civil drainage, external gulleys, and the new foul inspection manhole chamber itself.
- Rainwater downpipes, hoppers, and external guttering systems.
- Site waste-water treatment plants, septic tanks, and associated percolation areas.
- Main site water mains distribution, water utility connections, and central metering manifold construction.
- Centralised mechanical ventilation with heat recovery (MVHR/cMEV) – not required for this project.
- Portable fire extinguishers and fire blankets – refer to the Schedule of Works, Clause 8.5.

4 Particular Specification

4.1 General

The particular mechanical works described in the following sections address the specific adaptation and extension requirements for the dwelling at 8 Willmount Estate, Janesboro, Limerick. The works represent a domestic mechanical installation of a high municipal standard; all products specified shall be robust, durable, and highly corrosion-resistant.

The Mechanical Contractor shall be a registered member of the Mechanical Engineering Contractors Association (MECA) or an equivalent professional body, possessing all necessary insurances, licenses, and statutory approvals. Where specialised works are specified — including relocation of the gas-fired boiler and localised individual extract ventilation — the Contractor shall ensure that all installations are completed by approved specialists capable of issuing mandatory certification for building control compliance (BCAR).

All products, pipes, and fittings shall comply with the latest revisions of the relevant Irish (IS) and European (EN) standards. The complete installation must comply with all current Building Regulations, even where a specific clause or standard is not explicitly referenced within these contract documents. The Contractor shall be fully responsible for the integration of all mechanical elements, including those sub-contracted to specialists, and shall supply all necessary components to deliver fully functional systems whether shown in detail on the drawings or not.

4.2 Heating Centre (Element 51)

Existing Gas-Fired Boiler – Retention, Relocation and Re-Plumbing

The Mechanical Contractor shall survey, disconnect, relocate and reinstall the existing gas-fired boiler to accommodate the new hot water cylinder and revised pipework layout, complete with all necessary flue extension or relocation works carried out strictly in accordance with the manufacturer's instructions and current gas safety regulations, new gas supply pipework as required, and reconnection to both the existing and new radiator circuits. All gas works shall be carried out by a Registered Gas Installer (RGI) in accordance with I.S. 813 and current Building Regulations.

The existing boiler's make, model, rated output, service history and warranty status shall be confirmed on site by the Mechanical Contractor prior to tender return (refer to Project Hold, page 2). Where the existing appliance is found to be unsuitable for continued use or relocation, the Mechanical Contractor shall notify DMA Architects, the Employer's Representative, immediately for further instruction; no boiler replacement is included in this Specification unless separately instructed.

The boiler installation package shall incorporate a sealed system pressurisation unit (complete with expansion vessel, pressure gauge, filling loop, and safety relief valve), a primary circulating pump, a two-port motorized zone valve for the DHW cylinder circuit, and a fully wired control panel. The control package shall support independent time and temperature programming for space heating and domestic hot water, with provision for thermostatic radiator valve (TRV) control at each emitter.

Control Valves & Motorised Valves

All manual isolation valves shall be full-bore bronze wedge gate valves with non-rising spindles conforming to BS 5150. Motorized control valves shall be two-port spring-return zone valves with auxiliary end-switches, conforming to the electrical and physical requirements of BS EN 60730.

Automatic Controls & Room Sensors

The controls package shall comprise a programmable zone controller capable of managing independent heating schedules for the existing dwelling and the Extension, complete with a smart-device gateway for remote management.

The wall-mounted room sensors shall be Heatmiser DS1-L or an approved equivalent, featuring a clear LCD screen. In standard operation, the actual room temperature shall be displayed. Turning the adjustment dial shall display the set-point temperature for a period of 5 seconds before reverting to the room temperature.

Radiator Distribution System

Steel panel radiators shall be supplied and installed in all habitable rooms as indicated on the mechanical drawings, comprising both the retained radiators in the existing dwelling (fitted with new TRVs) and new radiators in the Extension. All new radiators shall be double panel double convector (Type 22) unless noted otherwise, sized by the Mechanical Contractor to achieve the design heat output for each space. Each radiator shall be fitted with a thermostatic radiator valve (TRV) on the flow connection and a lockshield valve on the return connection. The distribution pipework shall include:

- 22 mm OD copper tube primary flow and return from the boiler to a central header in the plant area.
- 15 mm OD copper tube branch circuits from the header to individual radiators or radiator groups, including the new branch to the Extension.
- Full-bore isolation valves at all branch takeoffs and at the boiler connections.
- Automatic air release vents at high points in the system and drain-off valves at low points.

Heating Pipework

All internal LPHW heating pipework shall be light gauge copper tube (IS 238) with capillary or compression fittings, properly supported and clipped to structure. Pipework shall be run concealed within floors or walls where possible or surface-mounted in purpose-made plastic or chrome clip systems. All heating pipework in unheated areas (roof void, under-floor, external runs) shall be insulated with pre-formed closed-cell foam insulation sections (minimum 25 mm wall thickness) to prevent heat loss and frost damage.

All pipework shall be pressure tested to 1.5 times the working pressure (minimum 3.0 bar) for a period of not less than one hour before any insulation or concealment is applied. Any leaks or defects identified during testing shall be rectified and the test repeated to the satisfaction of DMA Architects, the Employer's Representative.

Pre-Insulated Distribution Pipework

All distribution and primary heating pipework shall be copper tube (IS 238), thermally insulated with pre-formed closed-cell foam insulation in unheated areas. All joints shall be made with capillary fittings (end-feed or integral solder) or Type A compression fittings (Sanbra Fyffe or equivalent) for pipes 28 mm Ø and under.

Pipe Sleeves & Plates

Where pipework passes through solid walls, brickwork, or the dwelling party wall, the Contractor shall fit copper or heavy-duty plastic sleeves of a suitable diameter. Sleeves shall finish flush with the plaster or applied wall finish. Hard grey plastic 'Seamplate' wall and floor plates (manufactured by Scanglo Industries or equivalent) shall be installed to cover all pipe penetrations in finished rooms.

Balancing and Testing

Upon completion of the pipework installation, the complete wet heating system shall be subjected to a hydrostatic pressure test of 7.0 bar. This pressure must be maintained drop-tight for a continuous period of eight hours. Any leaks identified shall be rectified immediately using new materials, and the test repeated.

Following successful pressure testing, the system shall be commissioned and hydronically balanced. Correct balance must be demonstrated to DMA Architects, the Employer's Representative, by recording flow and return temperature readings at the boiler and at each radiator, verifying uniform heat output throughout the existing dwelling and the Extension.

4.3 Drainage (Element 52)

Above-Ground Waste Pipework

All internal, above-ground soil and waste pipework shall be supplied and installed by the Mechanical Contractor, connecting all sanitary ware, sinks, showers, and plant condensate drains to the vertical stacks or direct drainage upstands provided by the Main Contractor, including the new foul inspection manhole referenced in the Schedule of Works. All soil and waste pipework from wash hand basins (W.H.B.), water closets (W.C.), and kitchen sinks shall be rigid, unplasticized PVC (uPVC) or high-density polypropylene (PP) as manufactured by Wavin, Marley, or equivalent approved brands. All materials must be stored under cover on-site and protected from ultraviolet degradation prior to installation.

Jointing and Waste Stack Connections

All uPVC-to-uPVC connections shall be completed using rubber ring push-fit sockets or solvent-welded joints. Where solvent welding is executed, pipe ends shall be cut square using a fine-toothed saw, deburred, cleaned, and coated with the manufacturer's approved solvent adhesive before being pushed home to form a permanent joint.

Bends and Offsets

To prevent blockages, all changes of direction on waste pipes shall be completed using sweep-type, long-radius bends. Double-socketed pattern fittings suitable for solvent jointing shall be used in all concealed voids.

Pipe Supports

All horizontal above-ground waste pipework shall be rigidly supported at centers not exceeding 900 mm. Supports shall consist of proprietary plastic or rubber-lined steel brackets secured to masonry walls with rawlplugs and wood screws.

Waste Traps

The Contractor shall supply and install the following traps, ensuring all traps have a minimum 75 mm water seal and a removable sump for cleaning:

- 32 mm PVC Bottle Trap to all wash hand basins.
- 40 mm PVC Appliance Trap to all kitchen sinks, washing machines, and dishwashers.

All trap models must be approved by DMA Architects, the Employer's Representative, and a sample trap must be inspected and approved before bulk installation commences.

Venting and Weathering

All vertical soil stacks shall extend through the roof structure, terminating at least 300 mm above the roof or gutter line. Stacks shall be finished with an approved uPVC vent cowl and weatherproofed at the slate line using a proprietary lead-lined weathering slate collar.

Fire Stopping

Where plastic waste or soil stacks penetrate the dwelling party wall or fire-rated compartment walls or floors, the Contractor shall install proprietary intumescent fire collars. The collars must have a fire rating equal to or exceeding that of the penetrated structure (minimum 1-hour rating) and must be installed in strict accordance with the manufacturer's instructions.

Testing

The completed above-ground soils and wastes system shall be subjected to a standard water test. The system shall be filled with water to a minimum height of 1.5 meters head and inspected for leaks. Any faulty joints shall be cut out, remade using new fittings, and re-tested until proven completely water-tight.

4.4 Water Distribution (Element 53)

Mains and Drinking Water Installation

The unsoftened mains water connection shall be extended from the external meter manifold into the dwelling using heavy-duty blue MDPE barrier pipe laid in sand-filled trenches at a minimum depth of 750 mm below finished ground level. Inside the utility room, a primary draw-off branch shall be taken directly to the kitchen sink to provide unsoftened drinking water, complete with a double check valve.

Water Services Pipework & Fittings

All pressurized internal cold and hot water pipework shall be run in light gauge copper tube conforming to I.S. 238, manufactured in Ireland where possible. For pipe diameters of 35 mm Ø and greater, all joints shall be oxy-acetylene bronze-welded. For pipes of 28 mm Ø and under, compression fittings conforming to I.S. 239 Type 'A' (Sanbra Fyffe or equivalent) shall be used. No brazing of small-diameter pipes will be permitted.

Isolation Valves & Stopcocks

The Contractor shall install bronze, solid wedge gate valves with non-rising spindles conforming to I.S. 239 (Sanbra Fyffe Fig. 367L or equivalent) at the point of entry and manifold areas. Localized isolation of sanitary fittings shall be achieved using chrome-plated, screwdriver-operated ball valves ('Ballofix' or equivalent). No stopcock or isolation valve shall be installed in an exposed living area without the written approval of DMA Architects, the Employer's Representative.

Pipe Insulation

All internal hot and cold water pipework, including fittings and valves in unheated areas, shall be thermally insulated. Insulation shall consist of pre-formed closed-cell elastomeric foam sections (minimum 25 mm thickness) having a thermal conductivity not exceeding 0.035 W/mK.

Safety and Scald Protection

To comply with Building Regulations Part G and Part M (for accessible community dwellings), the Contractor shall install thermostatic mixing valves (TMV3 certified to BS EN 1111) at all bath and shower outlets to limit the maximum hot water discharge temperature to 43°C.

Pressure Testing

Upon completion of the water services pipework, but before thermal insulation is applied, the complete hot and cold water system shall be hydrostatically tested to 7.0 bar. The system must remain drop-tight under this pressure for a continuous period of eight hours. All testing must be conducted in the presence of DMA Architects, the Employer's Representative.

4.5 Ventilation (Element 57)

Mechanical Extract Fans

Continuous, low-noise mechanical extract ventilation shall be achieved in the dwelling using individual humidity-sensitive extraction fans to the Accessible W.C. (RM-05), W.C. (RM-06) and Utility Room (RM-04). Each fan shall incorporate a high-efficiency EC motor with a specific fan power conforming to Part L criteria, an integral back-draught shutter, and shall discharge directly to atmosphere via a short duct run through the external wall or roof. Passive background ventilation shall be provided via trickle vents in the windows.

Fire Collars

Where an extract fan's duct run penetrates the dwelling party wall, a compartment wall, or a fire-rated ceiling, the Contractor shall install a proprietary intumescent fire collar or damper. The collar must be certified to provide a fire resistance rating equal to that of the penetrated structure (minimum 1-hour rating).

Grilles and Diffusers

Extract grilles shall be adjustable, wall or ceiling-mounted disc valves constructed of white powder-coated steel or UV-stabilized plastic, complete with sealing gaskets to prevent air leakage around the housing. Grilles shall be adjusted and locked in position during the commissioning phase.

Commissioning and Testing

The complete ventilation installation shall be commissioned in conjunction with the equipment supplier and DMA Architects, the Employer's Representative. The Contractor shall balance the system using an anemometer to verify that the extraction rates at each fan comply with the minimum rates set out in Table 5.1 of Technical Guidance Document F.

4.6 Other Services (Element 58)

Painting and Metal Protection

After successful hydrostatic testing, all uninsulated, exposed steel pipework and support brackets shall be thoroughly wire-brushed to remove rust and scale, primed with one coat of red oxide primer, and finished with two coats of gloss paint to an approved BS colour scheme. Canvas or hard-faced insulation jackets shall be sized and prepared for paint finishes.

Dissimilar Metals

To prevent galvanic corrosion, where copper or stainless steel pipes are connected to galvanized steel or cast-iron mains, the Contractor shall insert an insulating brass bushing, a dielectric union, or a bronze flange. Direct contact between steel and copper surfaces is strictly prohibited.

Fire Stopping and Seals

All mechanical pipes and ventilation ducts passing through the dwelling party wall, fire compartment walls, or ceilings shall be sealed internally and externally to maintain a 1-hour fire rating. Sealing shall be achieved using:

- Intumescent wrap-around collars for plastic pipe penetrations.
- High-temperature intumescent acrylic sealants and mineral wool backing (minimum density 140 kg/m³) for copper and steel pipe penetrations.
- Fire-rated mortar or split blocks of compressible intumescent material for larger mechanical openings.

All seal installations must comply with the manufacturer's tested details, and the Contractor shall maintain a visual BCAR register of every penetration seal on-site.

Commissioning and Documentation

The commissioning of all mechanical services shall be executed in a structured and rigorous manner. The relocated gas-fired boiler, radiator circuit, hot water cylinder, and extract ventilation shall be commissioned directly by approved specialist technicians, including gas safety commissioning by a Registered Gas Installer.

All testing, balancing, and flow-rate data shall be recorded on official Commissioning Reports, which must be signed by the testing engineer and submitted to DMA Architects, the Employer's Representative, for approval in the following formats:

- CR.201: Water Services and Pressurization Test Report
- CR.202: Air Extract and Ventilation Balancing Report
- CR.203: Soils and Wastes Flow and Leakage Test Report
- CR.204: Hydronic Heating System and Gas-Fired Boiler Commissioning Report

Operation and Maintenance (O&M) Manuals

Prior to the formal handover of the building, the Mechanical Contractor shall supply to DMA Architects, the Employer's Representative, two hardback copies and one digital copy (on USB flash drive) of a comprehensive Operation and Maintenance Manual. The manual shall be bound in a heavy transparent cover and must contain:

- A detailed technical description of the complete mechanical installation.

- Step-by-step operating instructions for the boiler, radiator system, hot water cylinder, and extract ventilation fans.
- Emergency shutdown procedures for water, heating, gas and power failure scenarios.
- A recommended spare parts list with manufacturer part numbers and supplier contact details.
- A comprehensive preventative maintenance schedule for the first five years of operation.
- Full-sized "As-Installed" mechanical drawings, colour-coded to assist interpretation.
- All statutory BCAR certificates, gas safety certification, manufacturer warranty cards, and commissioning test sheets.

4.7 Site Services (Element 50)

The Mechanical Contractor shall supply, lay, pressure test, and commission all external pipework associated with the domestic water supply for the dwelling. The connection of the main water supply on the boundary of 8 Willmount Estate will be completed by others.

The Mechanical Contractor shall install a dedicated blue MDPE barrier pipe from the designated meter position to the internal plantroom/utility room, routing it underground at a minimum depth of 750 mm within a sand envelope (complete with yellow warning tape positioned 150 mm above the pipe). All external pipework shall be pressure tested to 10.0 bar for a period of two hours before backfilling is executed.

5 Specification Schedules

5.1 Schedule of Manufacturers and Suppliers

The Mechanical Contractor shall base the main lump-sum tender bid precisely upon the specified plant, materials, and equipment manufacturers detailed in the following schedule.

Should the Contractor propose alternative manufacturers, these proposals must not be included in the lump-sum tender. Alternatives may be offered in this schedule, detailing the manufacturer's name, the proposed model, the associated cost adjustment (credit or addition in Euros), and any impact on the delivery period. DMA Architects, the Employer's Representative, is under no obligation to accept or consider any alternative proposals.

Item No.	Equipment Description	Specified Manufacturer	Proposed Alternative Manufacturer	Cost Adjustment (€)	Delivery
1	Existing Gas-Fired Boiler (retained/relocated)	Existing appliance – N/A			
2	Steel Panel Radiators	Stelrad / Myson / Quinn (equal approved)			
3	Indirect Hot Water Cylinder	Megaflo / Joule / Santon (equal approved)			

Item No.	Equipment Description	Specified Manufacturer	Proposed Alternative Manufacturer	Cost Adjustment (€)	Delivery
4	Soil & Waste Pipework	Wavin (equal approved)			
5	Humidity-Sensitive Extraction Fans	Vent-Axia (equal approved)			
6	Thermostatic Mixing Valves	Horne / Reliance			

5.2 Mechanical Contractor BCAR and Part L Documentation

Certification Required for BCAR (Building Control Amendment Regulations)

The Mechanical Contractor shall supply the following formal, signed certification to the Assigned Certifier and DMA Architects, the Employer's Representative, to facilitate the BCAR validation process:

- **Certificate of Compliance (Design):** Verifying that the mechanical services design meets all relevant Technical Guidance Documents.
- **Certificate of Compliance (Construction – Form S):** Signed by the registered Mechanical Contractor, certifying that the systems have been constructed, installed, and tested in accordance with the approved plans and specifications.

Commissioning Certificates: Independent test sheets confirming successful commissioning of:

- The relocated gas-fired boiler, immersion heater backup, and space heating controls, including gas safety (RGI) commissioning.
- The individual mechanical extract ventilation fans (confirming flow rates in L/s at each grille).
- Hydrostatic pressure testing of hot and cold water pipework, LPHW radiator heating circuits, and above-ground soils and wastes.
- Thermostatic Mixing Valves (TMV3 calibration records for accessible bathrooms).

Certification Required for Part L Compliance

To demonstrate Part L compliance for the final Building Energy Rating (BER) assessment, the Mechanical Contractor shall supply:

- Signed designer and installer sign-off sheets for the boiler relocation and heating works.
- Manufacturer technical data sheets showing Specific Fan Power (SFP) for the extraction fans.
- Technical specifications of the pipework insulation, verifying compliance with the minimum insulation thickness tables of Part L.
- Flow and pressure commission sheets for all domestic circulating pumps and space heating circulation systems.

6 Mechanical Tender Summary and Breakdown

Tender Summary – The Mechanical Contractor shall transfer the section totals from the detailed mechanical estimate to this summary table, which shall form the basis of the mechanical contract sum. This contract is a fixed-price lump-sum contract and is not subject to re-measurement. All figures shall exclude Value Added Tax (VAT).

Item	System Description	Element Reference	Section Total (€)
.1	Mechanical Preliminaries & Insurances	Element 59.1	
.2	Heating Centre – Existing Boiler Relocation & Adaptation	Element 51	
.3	Above-Ground Drainage & Waste Services	Element 52	
.4	Water Distribution Services	Element 53	
.5	Radiator Heating & Hot Water Cylinder Systems	Element 56	
.6	Mechanical Extraction Ventilation Systems	Element 57	
.7	External Site Services & Water Mains	Element 50	
	TOTAL MECHANICAL PROPOSAL (to Bill of Quantities)	Element 59	€

Signed: _____

For and on Behalf of: _____

Date: _____