

MEP Services Concept Report
Social Housing, Munster Avenue, Galway

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GNCE

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1 EXECUTIVE SUMMARY

1.1 Project Description

This report provides an overview of the proposed MEP (Mechanical, Electrical, and Plumbing) services for the social housing project on Munster Avenue in Galway.

The project involves the provision of three new build one-bedroom units and the refurbishment of an existing two-storey house.

The objective of the report is to outline the mechanical and electrical design strategies that will maximize the Building Energy Rating (BER) while ensuring robust, durable, and maintainable systems.

The proposed MEP services will comply with all relevant standards and codes of practice, including the Building Regulations and the requirements of the Building Control (Amendment) Regulations.

Each unit will be certified as compliant by the designers and installers, and the entire development will be certified as fully compliant upon completion.

This report also provides specific details about the heating, ventilation, hot and cold-water services, soils and wastes services, electrical services, fire alarm and detection system, communication and information services, and security services for both the apartments and the house.

1.2 Objective

The purpose of this report is to provide an overview of the proposed MEP services for the units and to confirm the mechanical and electrical design strategies proposed to maximise the Building Energy Rating (BER) while providing the most robust, durable and maintainable systems as possible.

1.3 Compliance

Each new unit and the refurbished unit will conform to all relevant standards and codes of practice. Each unit will be designed in accordance with the Building Regulations and the requirements of the Building Control (Amendment) Regulations.

Each unit will be certified as Building Regulation and Code of Practice compliant by the designers and installers of each system, in accordance with the relevant service providers Codes of Practice.

The development will be certified as fully compliant with all Building Regulations on completion of the development by the Assigned Certifier and the Builders team in accordance with the Building Control (Amendment) Regulations.

2 Apartment Mechanical Services Concept – Ref Appendix I

2.1 Heating

It is proposed to provide a monoblock air-source heat pump located in the garden (ground floor apartment) and on the terraces (first & second floor apartments) for heating via underfloor in the habitable rooms. Ref. Apartment Heating Services Schematic in Appendix I

An air-source heat pump works by transferring heat from the outside air to an indoor space. A fan draws in air from outside and transfers it to an evaporator, which is situated in the heat pump. A refrigerant circulates inside the pump, which changes its physical state and evaporates even at low temperatures. The refrigerant steam needs to be raised to a level where it can be used for your heating and hot water, so it's compressed using a compressor. The heat produced in this process is transferred to the heating and hot water systems in your home. A step-by-step list can be seen below:

- The evaporator extracts energy from the air by forcing the liquid to transform into a gas.
- The compressor compresses the gas, which raises its temperature.
- The condenser exchanges the heat from the gas to the heating system, and the gas returns to a liquid state.
- The expansion valve lowers the pressure of the refrigerant, which triggers evaporation, and the cycle begins all over again.

The heat pump uses electricity to run, but it should use less energy than the heat the pump produces with Coefficient of Performance values ranging between 3.5 and 5, meaning that the heat pump efficiency has a range of between 350 – 500%.

Bathrooms will have a separate heating circuit from the heat pump which will feed a towel radiator which will be designed for low surface temperatures.

2.2 Centralised Mechanical Extract Ventilation

The kitchen and shower room will be supplied with a centralised Mechanical Extract Ventilation (c-MEV) system.

A centralised Mechanical Extract Ventilation system is a low energy, continuous mechanical extract ventilation system designed with multiple extract points to simultaneously draw moisture laden air out of the wet rooms (bathrooms and kitchen) providing a quieter and more efficient system compared to separate fans.

The unit will be located in the ceiling void of each shower room. Air is taken from the shower room and the kitchen and is exhausted externally via an exhaust grille. Fresh air enters the apartment

via insulated and acoustic permanent wall vents wall in the habitable rooms (bedrooms, living rooms).

Further extract from the kitchen will be via a kitchen extract hood vented to outside.

Ventilation will comply to TGD Part F 2019.

2.3 Hot & Cold-Water Services

It is proposed to provide each apartment with a combination unit for the hot and cold-water services. Each combination unit is comprised of a cold-water storage tank mounted over a copper cylinder (hot water storage) c/w with an electric immersion heater for backup and boost.

Mains Water Supply will be provided from the Local Authority Mains to a water meter at ground floor level (1 meter for each unit) and then to the cold-water storage tank of the combination unit which is Format 30 as required to meet the Local Authorities requirements for 24hour storage.

The hot water tank will be fed from the external heat pump unit via a diverter valve with the electric immersion in the cylinder providing backup and boost

Each tank will have its own feed to a negative head booster pump which will in turn feed all outlets as necessary.

2.4 Soils & Wastes Services

The installation will consist of a complete soils and wastes system above ground, including traps, overflows, vents, access points, fire collars and acoustic insulation. All connections from rooms into drainage system will be trapped to prevent foul air from the drainage system entering the units.

3 Apartment Electrical Services Installation

3.1 Main Cabling & Distribution

A new ESB meter will be supplied for each unit located externally at ground floor level which in turn will go to a small electrical board located in each unit. When the projected electrical loads are established, a formal application will be made to the ESB.

The installation shall be compliant with the 5th Edition National Rules for Electrical Installations IS-10101:2020 and the current ESB Networks requirements.

3.2 Lighting Services

A General Lighting system for each unit will be provided. The system will be designed with careful consideration for energy efficiency and day lighting.

The installation will be compliant with the current CIBSE Lighting Guides, IS EN 12464, IS 3217:2013+A1:2017 and 5th Edition National Rules for Electrical Installations IS10101:2020

All Luminaires will be supplied and installed in position and will be integrated with the Architectural requirements for the units.

General & Emergency lighting will be provided in shared circulation areas (landlord) in accordance with I.S. 3217:2023.

3.3 Fire Alarm & Detection System

Each apartment will be supplied with a domestic fire alarm and detection system as per I.S. 3218:2024

3.4 Communication & Information Services

A superfast Broadband and IP Television System will be provided to each of the apartments. Service provider to be confirmed.

3.5 Security Services

Each unit will be provided with an intruder alarm which will conform to EN 50131.

4 House Mechanical Services Concept – Ref Appendix II

4.1 Heating

It is proposed to provide a monoblock air-source heat pump located in the garden for heating via LST radiators in rooms as required.

An air-source heat pump works by transferring heat from the outside air to an indoor space. A fan draws in air from outside and transfers it to an evaporator, which is situated in the heat pump. A refrigerant circulates inside the pump, which changes its physical state and evaporates even at low temperatures. The refrigerant steam needs to be raised to a level where it can be used for your heating and hot water, so it's compressed using a compressor. The heat produced in this process is transferred to the heating and hot water systems in your home. A step-by-step list can be seen below:

- The evaporator extracts energy from the air by forcing the liquid to transform into a gas.
- The compressor compresses the gas, which raises its temperature.
- The condenser exchanges the heat from the gas to the heating system, and the gas returns to a liquid state.
- The expansion valve lowers the pressure of the refrigerant, which triggers evaporation, and the cycle begins all over again.

The heat pump uses electricity to run, but it should use less energy than the heat the pump produces with Coefficient of Performance values ranging between 3.5 and 5, meaning that the heat pump efficiency has a range of between 350 – 500%.

4.2 Local Mechanical Extract Ventilation

The shower rooms and WC's will be supplied with a Local Mechanical Extract Ventilation system.

These will be activated via the light switch with a 5 minute overrun.

Fresh air enters the apartment via insulated and acoustic permanent wall vents wall in the habitable rooms (bedrooms, living rooms).

Further extract from the kitchen will be via a kitchen extract hood vented to outside.

Ventilation will comply to TGD Part F 2019.

4.3 Hot & Cold-Water Services

It is proposed to provide the house with a 200 litre Hot Water Storage Tank unit for the hot water services. The hot water tank will be fed from the external heat pump unit via a diverter valve with an electric immersion in the cylinder providing backup and boost

Mains Water Supply will be provided from the Local Authority Mains to a water meter at ground floor level and then to the cold-water storage tank located in the attic which is Format 30 as required to meet the Local Authorities requirements for 24hour storage. This cold-water storage tank will have a submersible pump to boost cold water to all outlets as required.

4.4 Soils & Wastes Services

The installation will consist of a complete soils and wastes system above ground, including traps, overflows, vents, access points, fire collars and acoustic insulation. All connections from rooms into drainage system will be trapped to prevent foul air from the drainage system entering the units.

5 House Electrical Services Installation

5.1 Main Cabling & Distribution

A new ESB meter will be supplied for the house located externally at ground floor level which in turn will go to a small electrical board located in the entrance hallway. When the projected electrical loads are established, a formal application will be made to the ESB.

The installation shall be compliant with the 5th Edition National Rules for Electrical Installations IS-10101:2020 and the current ESB Networks requirements.

5.2 Lighting Services

A General Lighting system for the house will be provided. The system will be designed with careful consideration for energy efficiency and day lighting.

The installation will be compliant with the current CIBSE Lighting Guides, IS EN 12464, IS 3217:2013+A1:2017 and 5th Edition National Rules for Electrical Installations IS10101:2020

All Luminaires will be supplied and installed in position and will be integrated with the Architectural requirements for the house.

5.3 Fire Alarm & Detection System

The house will be supplied with a domestic fire alarm and detection system as per I.S. 3218:2013+A1:2019.

5.4 Communication & Information Services

A superfast Broadband and IP Television System will be provided to the house. Service provider to be confirmed.

5.5 Security Services

The house will be provided with an intruder alarm which will conform to EN 50131.

Appendix I – Apartment MEP Concept Drawings

WATER SERVICES NOTES

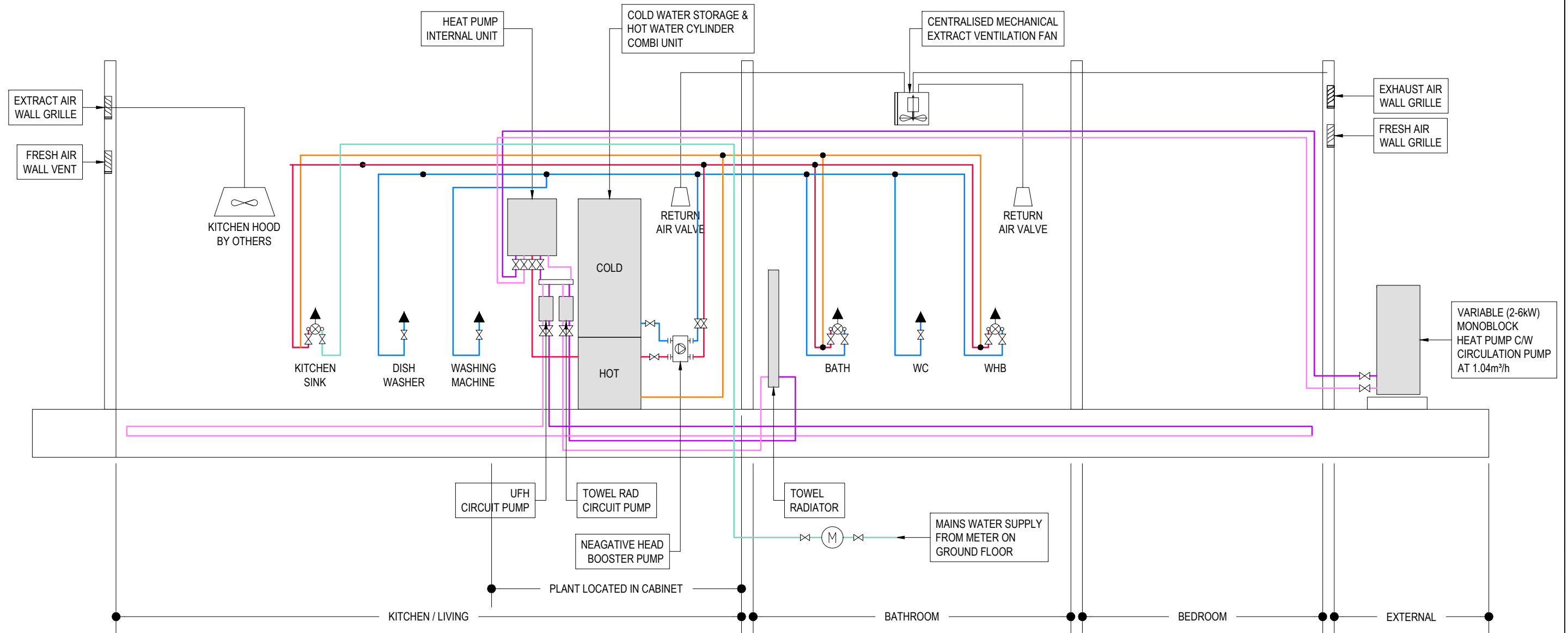
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. THE WATER SERVICES INSTALLATION SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH BS 6700:2006, THE REQUIREMENTS OF THE LOCAL AUTHORITY AND CURRENT BUILDING REGULATIONS.
3. ALL HIGH POINTS TO HAVE A MANUAL AIR VENT FITTED.
4. ALL LOW POINTS TO HAVE DRAIN COCKS FITTED.
5. ALL INTERNAL PIPEWORK TO BE INSULATED WITH CLASS '0' INSULATION, THICKNESS TO CONFORM TO BS 5422.
6. ALL WATER SERVICES PIPEWORK TO BE PPR / ALUPEX
7. ALL BRANCHES SHALL HAVE ISOLATING VALVES FITTED.
8. ENSURE PIPEWORK IS PRESSURE TESTED AND WITNESSED BEFORE IT IS CONCEALED.
9. ALL PIPEWORK PENETRATING FIRE COMPARTMENTS/WALLS SHALL BE SLEEVED AND SEALED WITH INTUMESCENT MASTIC.
10. ADEQUATE ACCESS SHALL BE PROVIDED THROUGH-OUT FOR CLEANING AND TESTING OF THE WATER SERVICES.
11. ALL SANITARY WARE SHALL BE HIGH PRESSURE AND SUPPLIED BY THE MAIN CONTRACTOR.
12. FITTING AND CONNECTION OF SANITARY APPLIANCES TO BE BY MECHANICAL CONTRACTOR.
13. ALL SANITARY CONNECTIONS TO BE Ø15 UNLESS STATED OTHERWISE..
14. ALL PIPEWORK, FITTINGS AND EQUIPMENT SHALL BE CLEARLY LABELLED.
15. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR CO-ORDINATING ALL SERVICES ON SITE.
16. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH SCHEMATIC, SERVICES LAYOUTS, SPECIFICATION, RELEVANT ARCHITECTS, STRUCTURAL & FIRE ENGINEERS DRAWINGS.
17. ALL WHB & SINKS TO BE FITTED WITH TMV3 THERMOSTATIC MIXING VALVES REGULATING HOT WATER TEMP TO 41°C
18. ALL EXTERNAL EXPOSED PIPEWORK TO BE HEAT TREATED.
19. WARNING PIPE & OVERFLOW TO DISCHARGE IN VISIBLE LOCATIONS.

LPHW NOTES

1. ALL HIGH POINTS TO HAVE A MANUAL AND AUTOMATIC AIR VENT FITTED.
2. ALL LOW POINTS TO HAVE DRAIN COCKS FITTED.
3. ALL INTERNAL LPHW PIPEWORK TO BE UNIPIPE MULTILAYER PIPE.
4. ALL BRANCHES SHALL HAVE ISOLATING VALVES FITTED.
5. ENSURE PIPEWORK IS PRESSURE TESTED AND WITNESSED BEFORE IT IS CONCEALED.
6. ADEQUATE ACCESS SHALL BE PROVIDED THROUGH-OUT FOR CLEANING AND TESTING OF THE LPHW SERVICES PIPEWORK.
7. FIXED ORIFICE DOUBLE REGULATING VALVES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS WITH A MINIMUM OF 10 DIAMETERS OF STRAIGHT PIPE UPSTREAM AND 5 DIAMETERS DOWNSTREAM OF THE VALVE.
8. ALL PIPEWORK, FITTINGS AND EQUIPMENT SHALL BE CLEARLY LABELLED.
9. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR CO-ORDINATING ALL SERVICES ON SITE.
10. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH SCHEMATICS, SPECIFICATIONS, RELEVANT ARCHITECTS, STRUCTURAL & FIRE ENGINEERS DRAWINGS.
11. THIS DRAWING SHALL BE READ IN CONJUNCTION LPHW P&ID FOR ALL VALVING ARRANGEMENTS.
12. ON COMPLETION OF THE INSTALLATION THE MECHANICAL CONTRACTOR SHALL FULLY FLUSH THE INSTALLATION. THE LPHW SYSTEM SHALL BE CHEMICALLY TREATED AS DETAILED IN THE MECHANICAL SPECIFICATION. THE MECHANICAL CONTRACTOR SHALL ISSUE A METHOD STATEMENT TO THE ENGINEER PRIOR TO UNDERTAKING THESE WORKS.
13. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCING HIS OWN CO-ORDINATED WORKING DRAWINGS.
14. ALL INTERNAL PIPEWORK TO BE INSULATED WITH CLASS '0' INSULATION, THICKNESS TO CONFORM TO BS 5422.
15. ALL PIPEWORK IN EXPOSED AREAS TO BE CLADDED IN ALUMINIUM AND INSULATED WITH CLASS '0' INSULATION, THICKNESS TO CONFORM TO BS 5422.

WATER SERVICES SYSTEM COLOUR LEGEND

LOW TEMP HOT WATER FLOW	LOW TEMP HOT WATER RETURN	MAINS WATER	COLD WATER	HOT WATER FLOW	HOT WATER RETURN	EXTRACT DUCT



REV	DESCRIPTION	BY	CHK	APP	DATE
P1	PROGRESS/CONCEPT ISSUE	MS	GN	GN	14.07.2022
P2	PROGRESS/CONCEPT ISSUE	MS	GN	GN	FEB 2024
P3	PROGRESS/CONCEPT ISSUE	MS	GN	GN	OCT 2024
P4	PROGRESS/CONCEPT ISSUE	MS	GN	GN	DEC 2024

TITLE	TYPICAL APARTMENT MECHANICAL SCHEMATIC
PROJECT	SOCIAL HOUSING GALWAY

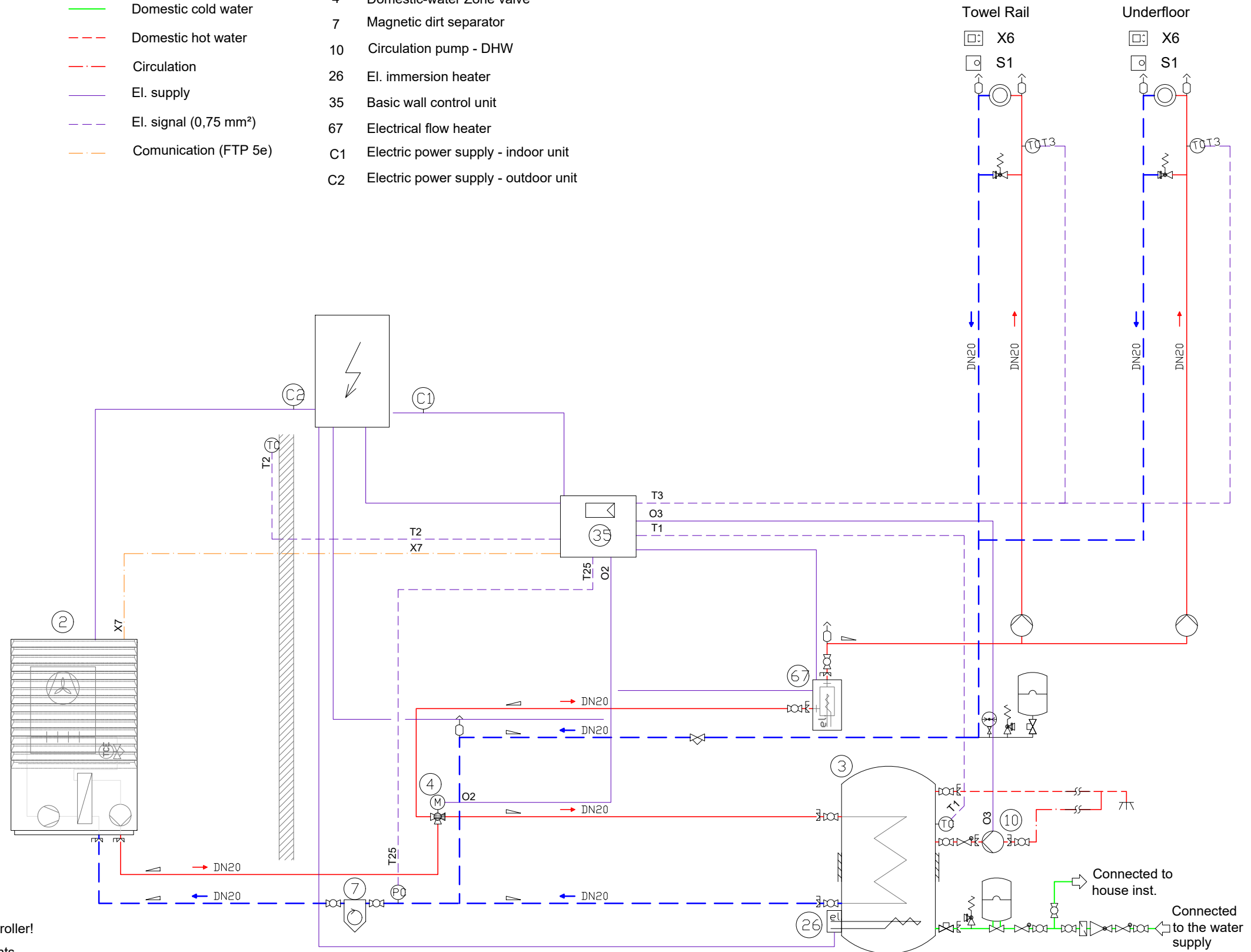
DISCIPLINE	MECHANICAL	PROJECT NO. - DRAWING NO	2208-M100	REVISION	P4
CLIENT	GALWAY C.C.	SCALE	NTS	SHEET SIZE	A3

SYMBOLS LEGEND:

- Circulation pump
- Compressor
- Ball valve with actuator
- Temperature sensor
- Pressure sensor
- Manometer
- Thermometer
- Safety thermostat
- Magnetic dirt separator
- Ball valve
- Ball valve (closed)
- Safety valve
- Overflow valve
- Balancing valve
- Check valve
- Ball valve (with check valve)
- Expansion vessel
- Air vent
- Flow electric heater
- Heat exchanger
- Sanitary water filter
- Reducing pressure valve
- Thermal insulation
- Inclination
- Reduction
- Screwed joint w/ union nut
- Screwed end plug
- Controller
- Room controller
- Room thermostat

MARKS LEGEND:

- 2 Air - water heat pump
- 3 Domestic water tank
- 4 Domestic-water Zone valve
- 7 Magnetic dirt separator
- 10 Circulation pump - DHW
- 26 El. immersion heater
- 35 Basic wall control unit
- 67 Electrical flow heater
- C1 Electric power supply - indoor unit
- C2 Electric power supply - outdoor unit



NOTE: Room controller can also be the main controller!
 Drain valves should be provided at the lowest points,
 air vents should be installed at the highest points!

REV	DESCRIPTION	BY	CHK	APP	DATE
P1	PROGRESS/CONCEPT ISSUE	MS	GN	GN	OCT 24

TITLE	TYPICAL APARTMENT HEATING SERVICES SCHEMATIC
PROJECT	SOCIAL HOUSING GALWAY

DISCIPLINE	MECHANICAL	PROJECT NO. - DRAWING NO	2208-M101	REVISION	P1
CLIENT	GALWAY C.C.	SCALE	NTS	SHEET SIZE	

Appendix II – House MEP Concept Drawings

WATER SERVICES SYSTEM COLOUR LEGEND

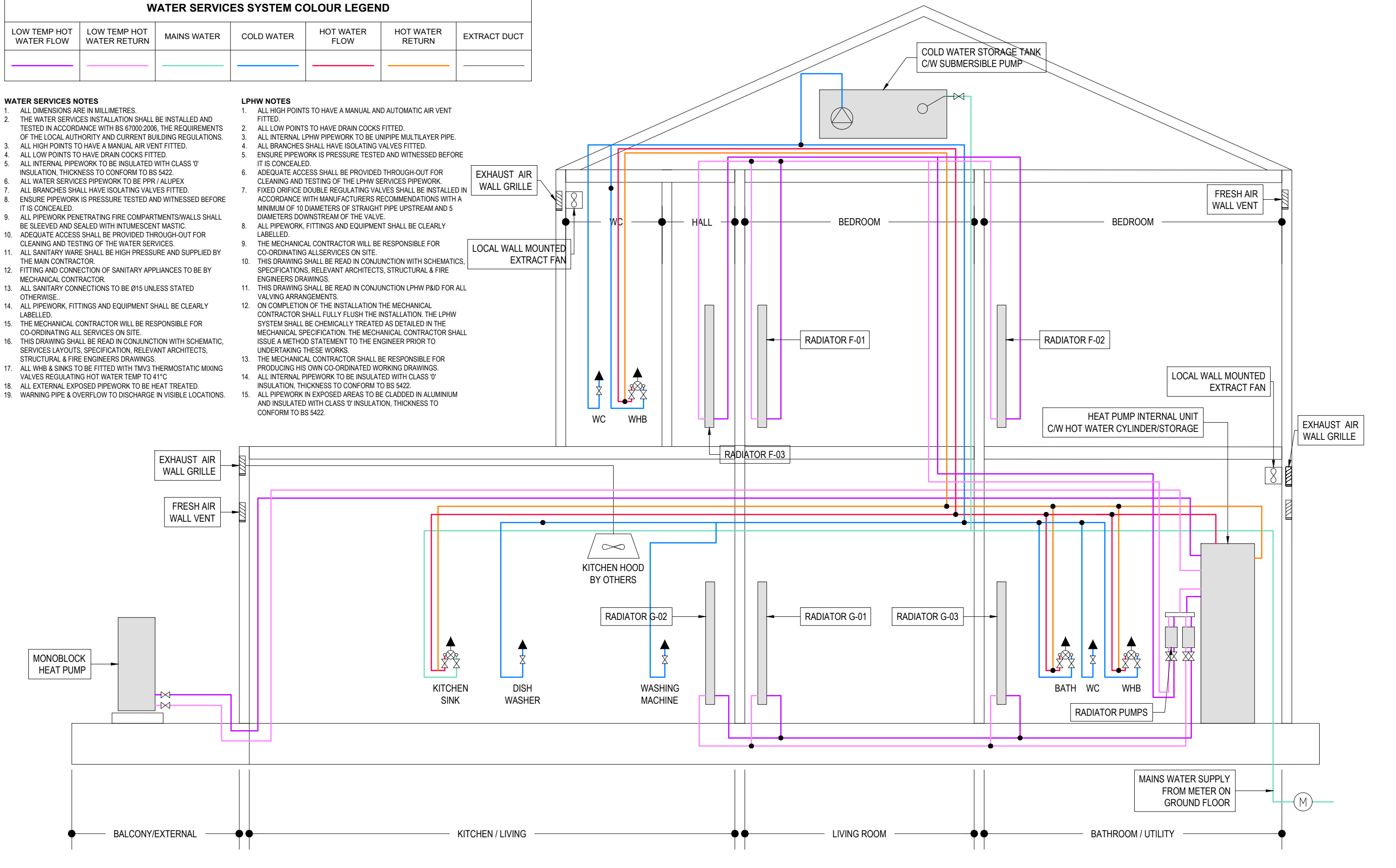
LOW TEMP HOT WATER FLOW	LOW TEMP HOT WATER RETURN	MAINS WATER	COLD WATER	HOT WATER FLOW	HOT WATER RETURN	EXTRACT DUCT

WATER SERVICES NOTES

- ALL DIMENSIONS ARE IN MILLIMETRES.
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- WARNING PIPE & OVERFLOW TO DISCHARGE IN VISIBLE LOCATIONS.

LPHW NOTES

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REV	DESCRIPTION	BY	CHK	APP	DATE
P1	PROGRESS/CONCEPT ISSUE	MS	GN	GN	FEB 2024
P2	PROGRESS/CONCEPT ISSUE	MS	GN	GN	DEC 2024

TITLE	HOUSE MECHANICAL SCHEMATIC
PROJECT	SOCIAL HOUSING GALWAY

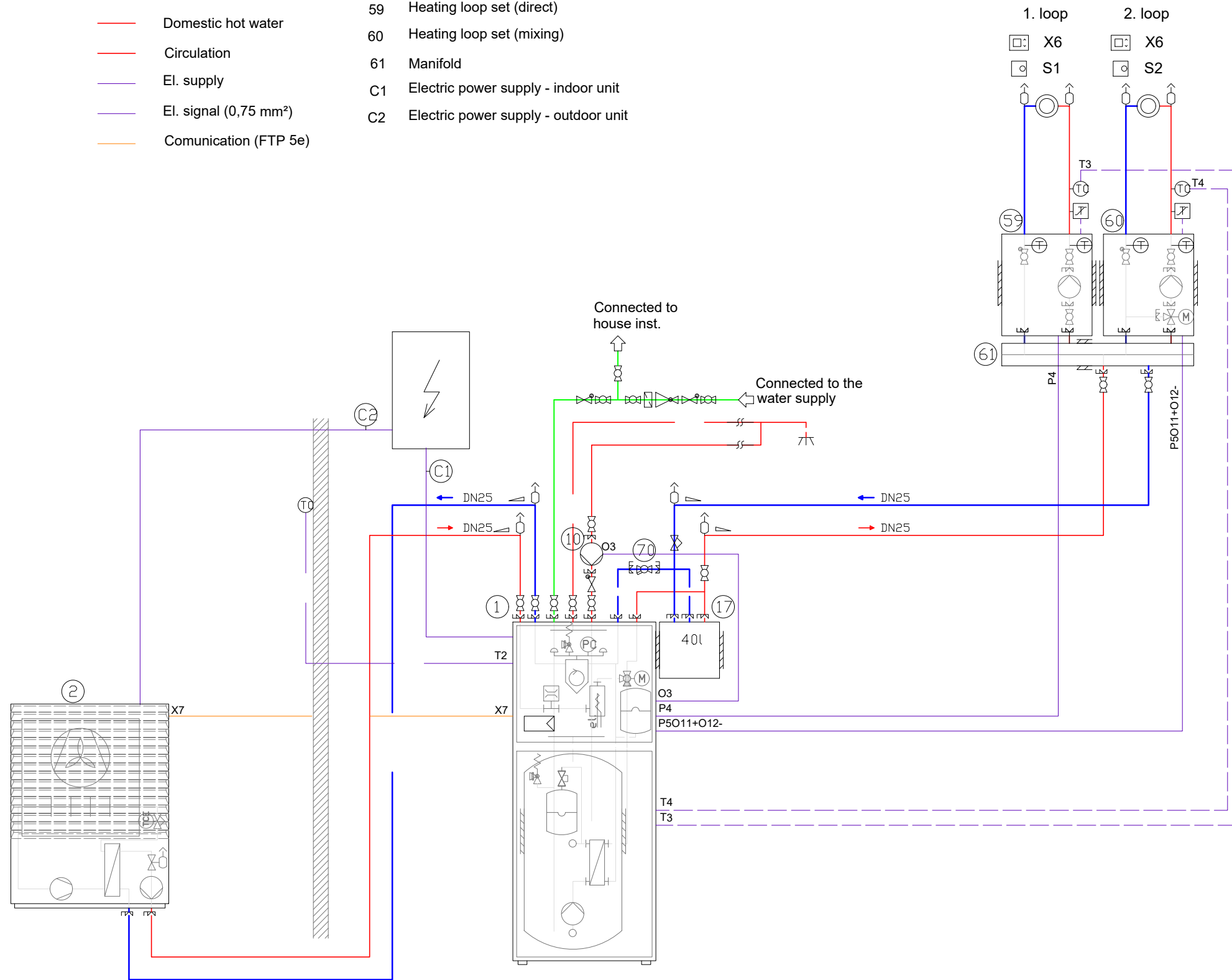
DISCIPLINE	MECHANICAL	PROJECT NO. - DRAWING NO	2208-M102	REVISION	P2
CLIENT	GALWAY C.C.	SCALE	NTS	SHEET SIZE	A3

SYMBOLS LEGEND:

- Circulation pump
- Compressor
- Three way mixing valve
- Ball valve with actuator
- Temperature sensor
- Pressure sensor
- Manometer
- Thermometer
- Safety thermostat
- Multi func. dirt separator
- Ball valve
- Safety valve
- Balancing valve
- Check valve
- Ball valve (with check valve)
- Strainer
- Expansion vessel
- Air vent
- Flow electric heater
- Heat exchanger
- Sanitary water filter
- Reducing pressure valve
- Thermal insulation
- Inclination
- Screwed joint w/ union nut
- Consumer
- Controller
- Room controller
- Room thermostat

MARKS LEGEND:

- 1 Hydro module
- 2 Air - water heat pump
- 10 Circulation pump - DHW
- 59 Heating loop set (direct)
- 60 Heating loop set (mixing)
- 61 Manifold
- C1 Electric power supply - indoor unit
- C2 Electric power supply - outdoor unit



NOTES:

Circulation pumps connected to P outputs must be with PWM2 signal!
 Drain valves should be provided at the lowest points, air vents should be installed at the highest points!

NOTES:

One of the room controllers can also be the main controller!
 Instead of mixing loop a direct loop can be used!

REV	DESCRIPTION	BY	CHK	APP	DATE
P1	PROGRESS/CONCEPT ISSUE	MS	GN	GN	OCT 24

TITLE	HOUSE HEATING SERVICES SCHEMATIC
PROJECT	SOCIAL HOUSING GALWAY

DISCIPLINE	MECHANICAL	PROJECT NO. - DRAWING NO	2208-M103	REVISION	P1
CLIENT	GALWAY C.C.	SCALE	NTS	SHEET SIZE	