MOLONEYFOX
CONSULTING ENGINEERS

20.2068

MECHANICAL AND ELECTRICAL SERVICES REPORT
BRODERICK BOTHAR NA CHOISTE Res SHD
GALWAY

DATE: 22/06/2022

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The local ESB medium voltage infrastructure has the capacity to cater for the proposed development. The medium voltage infrastructure shall be extended via underground ducts from the An Triantan Ground Mounted Substation located at the shopping centre.

This extension of the ESB infrastructure has been agreed in consultation with the developer and ESB Network Engineers.

The development shall be served using 2no. ground mounted transformers, mini pillars and micro pillars. The residential units shall be fed from local mini pillars, with public lighting fed from micro pillars. This is a typical arrangement for residential projects.

The ESB Infrastructure including ESB mini pillars shall cater for electric car charging points in car park areas.

There are no ESB overhead cables in the vicinity of the site that require diversions.

With regards to the local ESB services to each dwelling and apartment, provision shall be made to deliver adequate services to each dwelling and apartment to cater for both the electrical needs of the unit in terms of power for heat pumps and electrical car charging facilities.

Fig 1: Existing Ground Mounted Sub Station for medium voltage connection

Fig 2. ESB Record Drawing that indicates no overhead cable diversions required.

2.0 EIR SERVICES

The existing EIR infrastructure currently runs overhead along the site boundary. In order to service this development, a new service shall be derived from the Eir network located at junction of the An Triantan Shopping Centre via underground ducts.

The proposed ducting shall be extended with the ESB ducting and any public Utilities ducting that maybe required along this road. This service shall provide both voice and broadband communications to the development to cater for residents needs. Within the development, the ducting system shall be brought to each dwelling and apartment block.

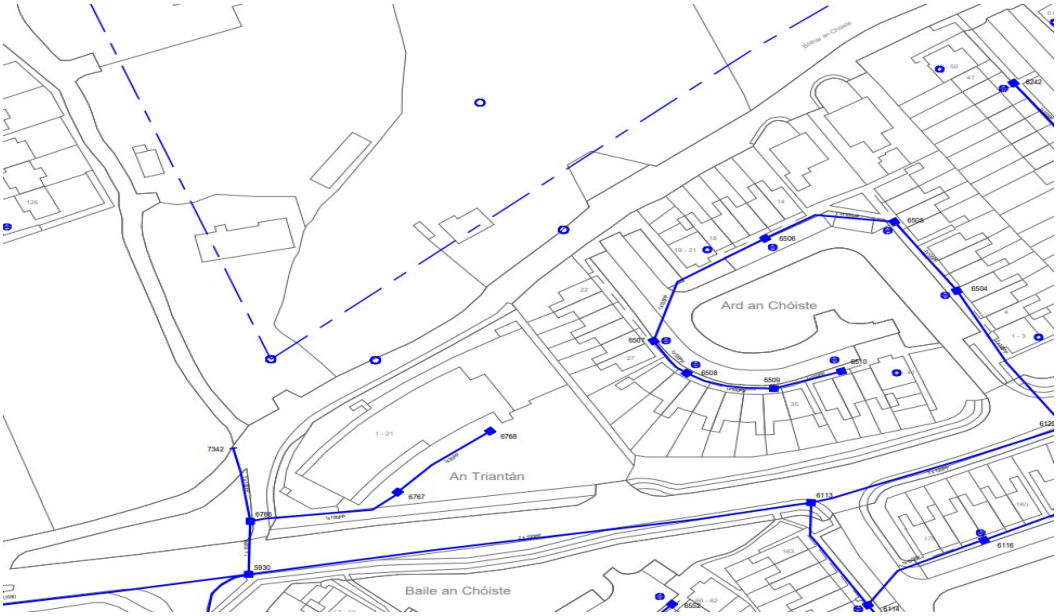


Fig 3 – Existing underground duct network at An Triantan and overhead network along the access road to the proposed development.

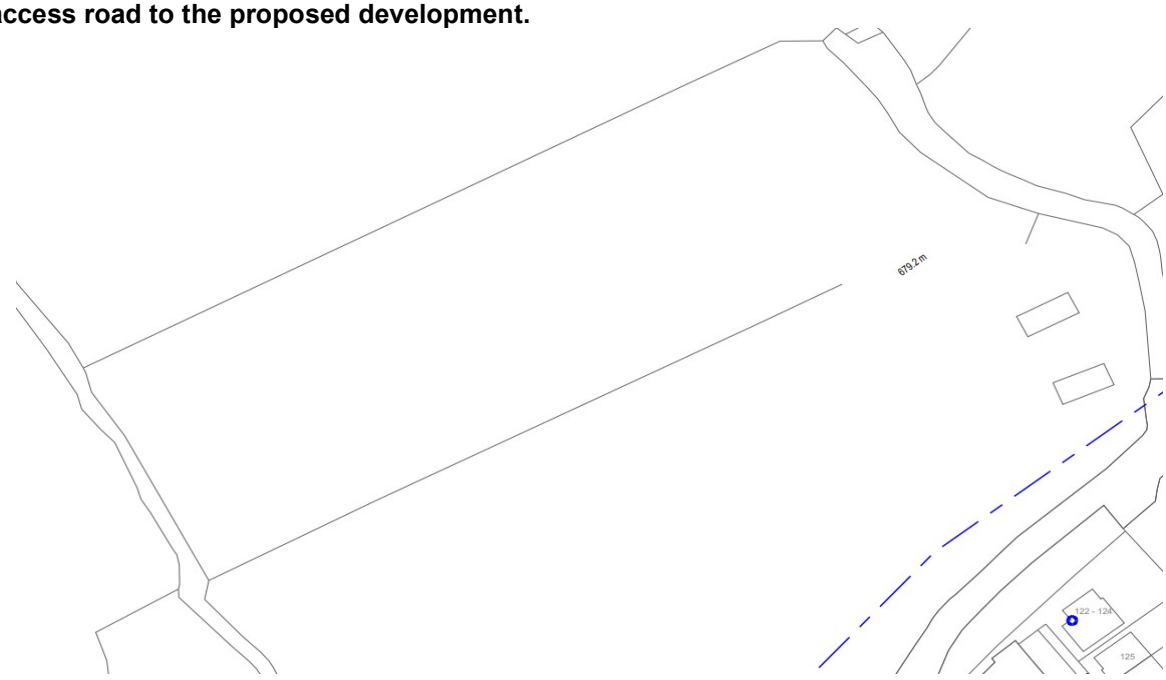


Fig 4 – Existing overhead cables traversing the site that will be undergrounded.

3.0 NZEB REQUIREMENTS

The Definition: 'Nearly Zero Energy Buildings', nZEB means a building that has a very high energy performance where the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources including energy from renewable sources produced on-site or nearby".

In order to achieve this, a target of 20% Renewables Energy Ratio (RER) has been set as the NZEB energy from renewable sources onsite or nearby target. The software tool provided by SEAI will be provided to support the calculation of the RER. It is recognised that in certain confined situations it may not be possible to achieve the full 20% RER.

In addition to the reduced energy usage, all new buildings must generate 20% of their energy from renewable energy sources, although this may be reduced to 10% where the energy performance of the building is more than 10% better than the reference building. This option of further reducing energy use is likely to be selected for most buildings.

As part of the design process, consideration shall be taken in account with regards to the requirements of nZEB to ensure the building meets with its requirements.

The 20% or 10% requirement can be provided by Heat Pumps or Heat pumps / PV's.

The building will be constructed to meet the latest building regulations and U-Values for each element of the envelope:

Building Fabric / Specification

Floor	0.12 W/m²k
Walls	0.18 W/m²k
Roof	0.15 W/m²k
Doors	1.6 W/m²k
Windows	1.2 W/m²k
Thermal Bridging Factor	0.08 (ACDs must be adhered to)

Ventilation

Ventilation Method	Demand Controlled Ventilation (DCV)
Ventilation openings	-
Air Permeability Test Result	3ac/h | 0.15 adj (assumption)

These target values shall achieve an A2 rating dwelling using a heat pump solution with no PV panels.

4.0 DESIGN INTENT FOR HOUSES AND APARTMENTS

It is proposed that the houses will be heated by means of an air to water heat pump heating systems.

It is proposed to utilize a mono-block unit to heat each individual house. The mono-block unit is A+++ rated and uses the latest R32 refrigerant gas. The unit will provide heat energy for heating and hot water generation. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required.

These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

We estimate the houses will require either 9-12kw units depending on the house type and size.

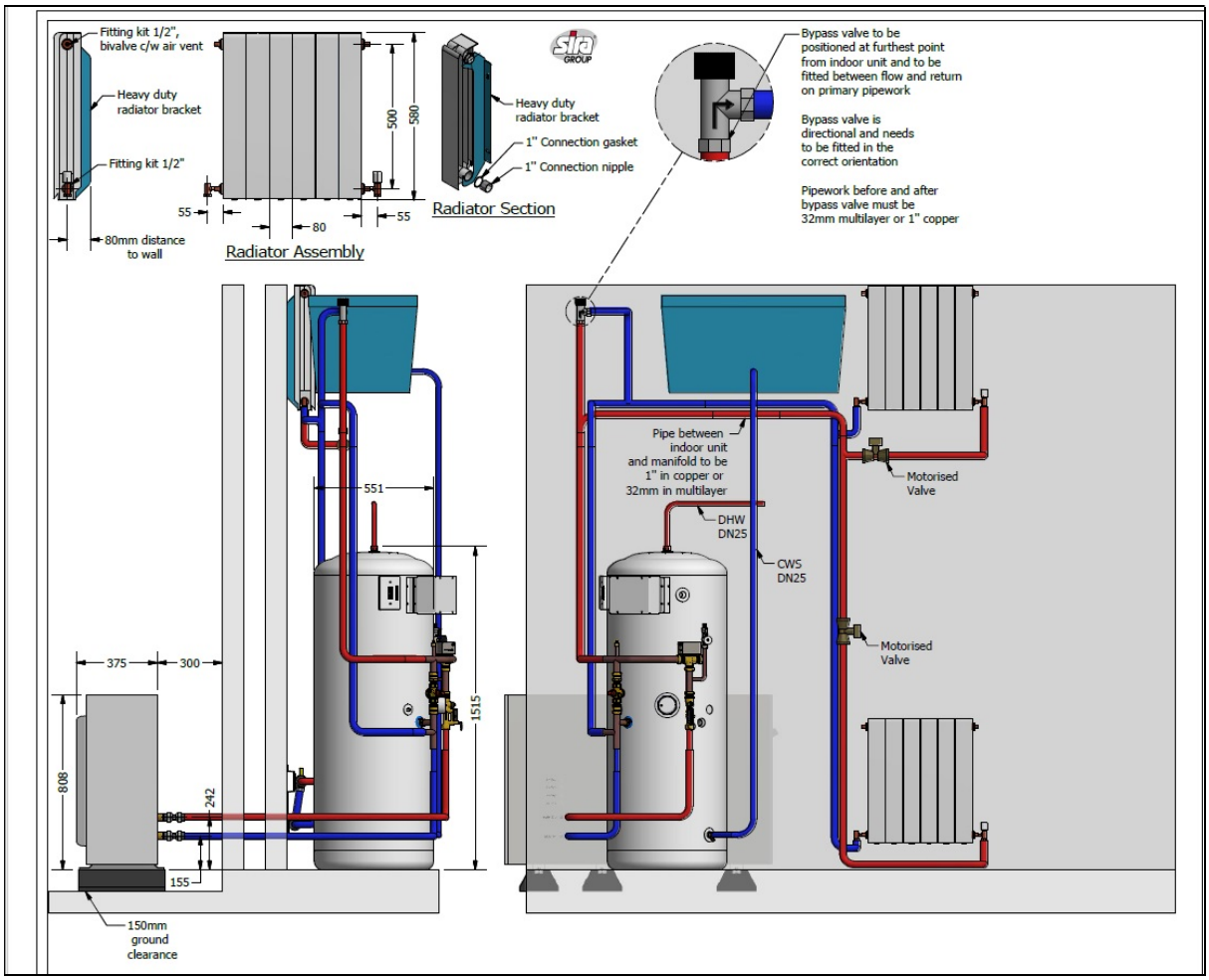
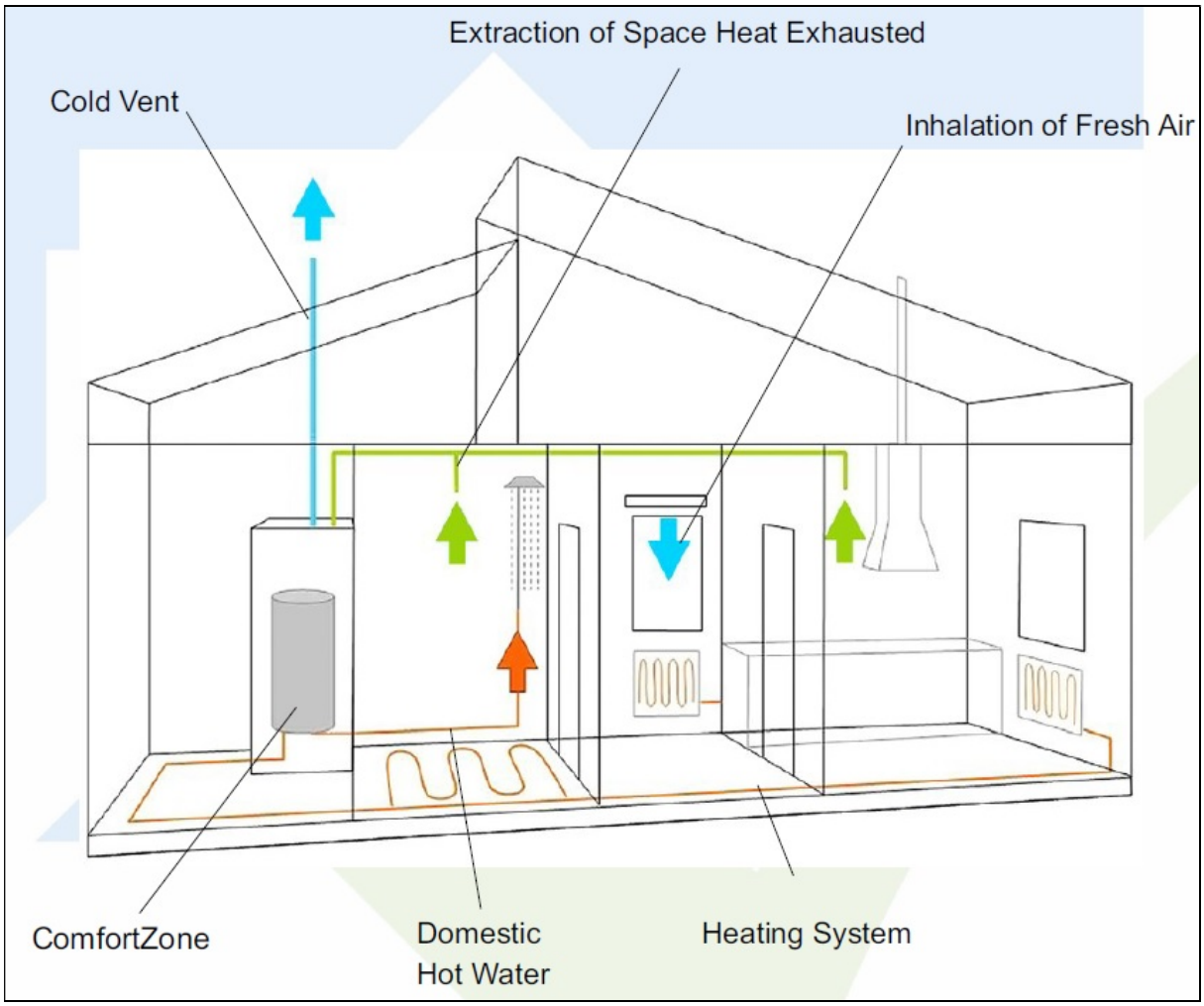


Figure 1: Proposed Heating System Schematic

The apartments will be heated by means of exhaust air heat pump systems. It is proposed to utilize exhaust air heat pumps. The unit is A++ rated. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required. These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

The unit is complete with an integral 210 litre hot water calorifier and will provide both domestic heat and hot water generation. We estimate the apartments will require a 3.5kw unit.



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We have carried out some preliminary BER calculations for some typical house types and we are achieving in general an A2 BER rating and compliance with Part L using a heat pump solution and in some cases PV's.

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External wall mounted lighting will be provided with specification to be agreed with architect.

The fire alarm system for the houses and Apartments will be a LD2 domestic type consisting of mains fed smoke, heat and carbon monoxide monitors with battery backup.

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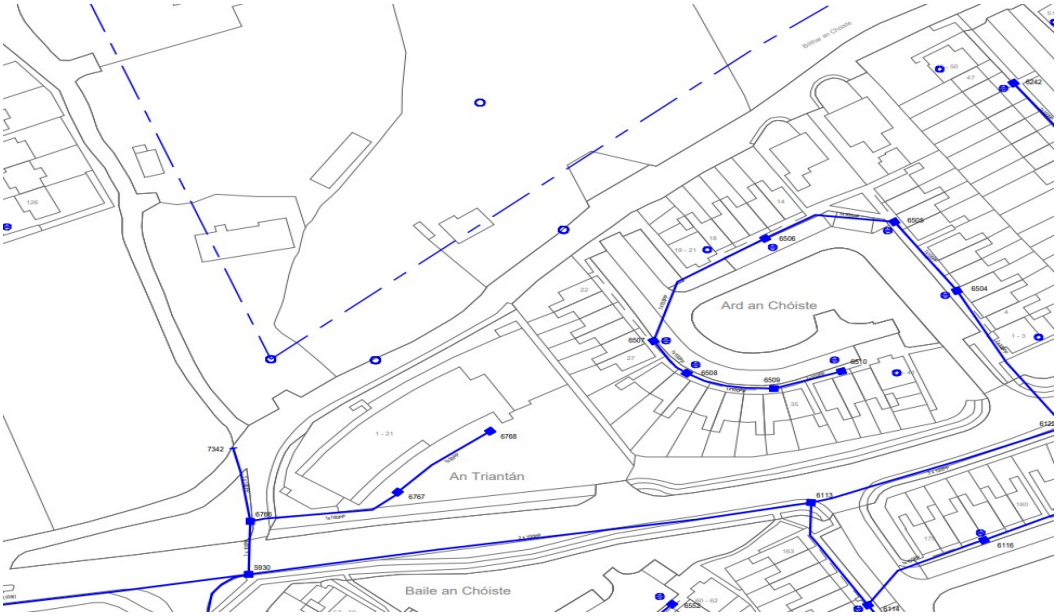

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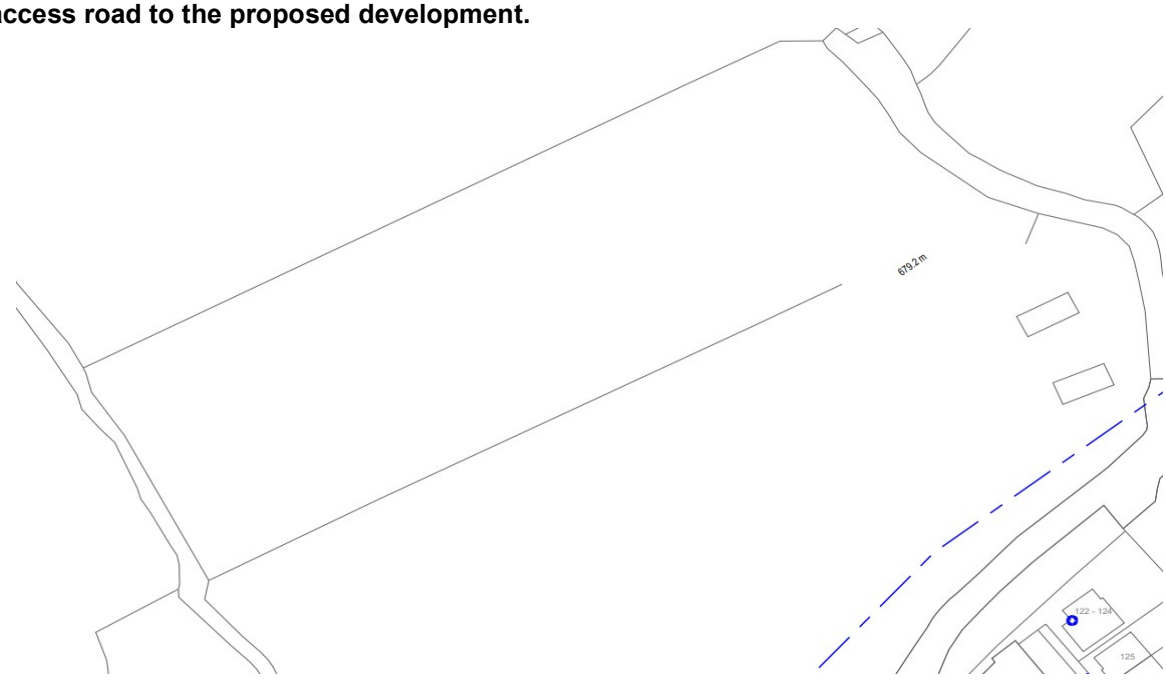

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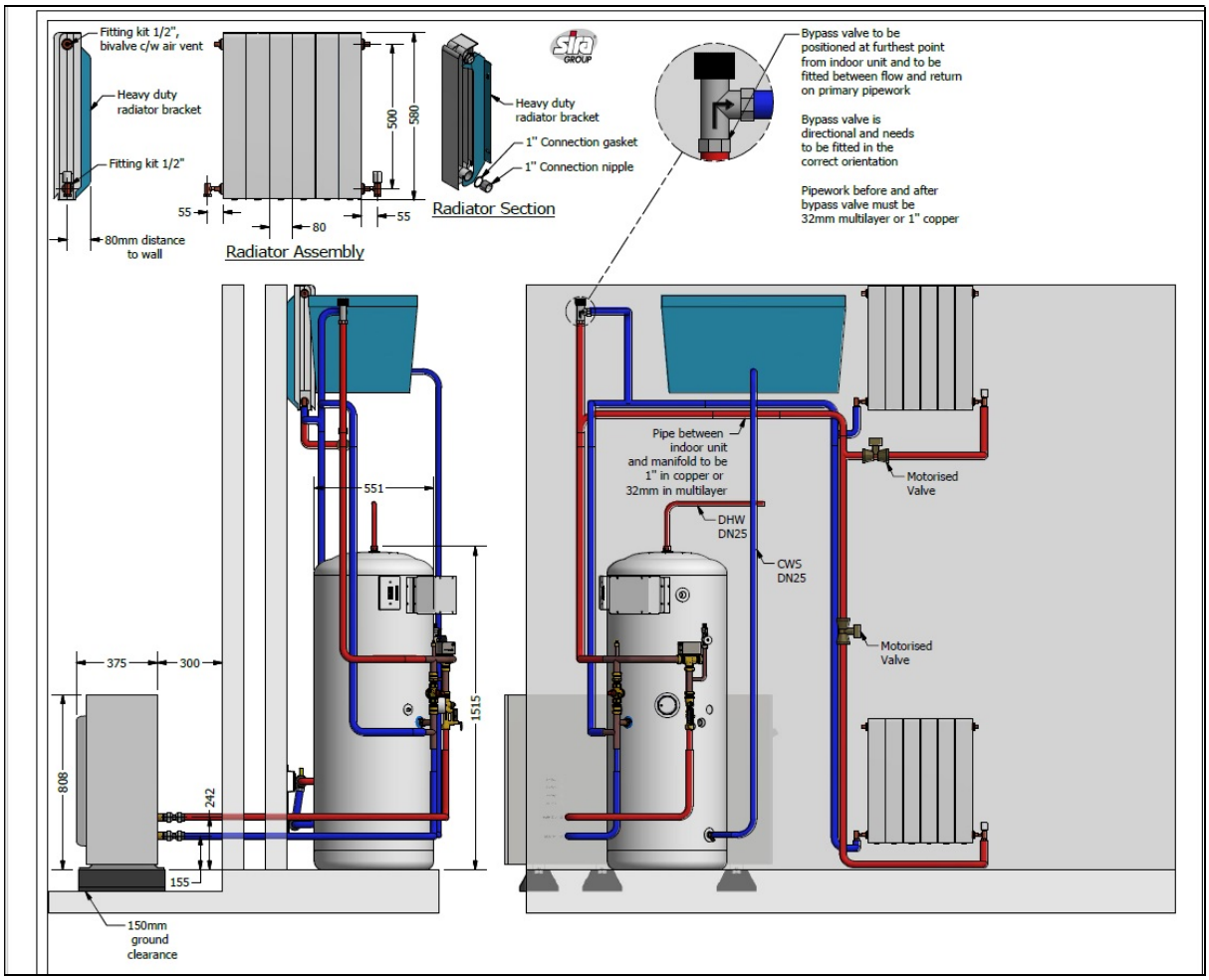

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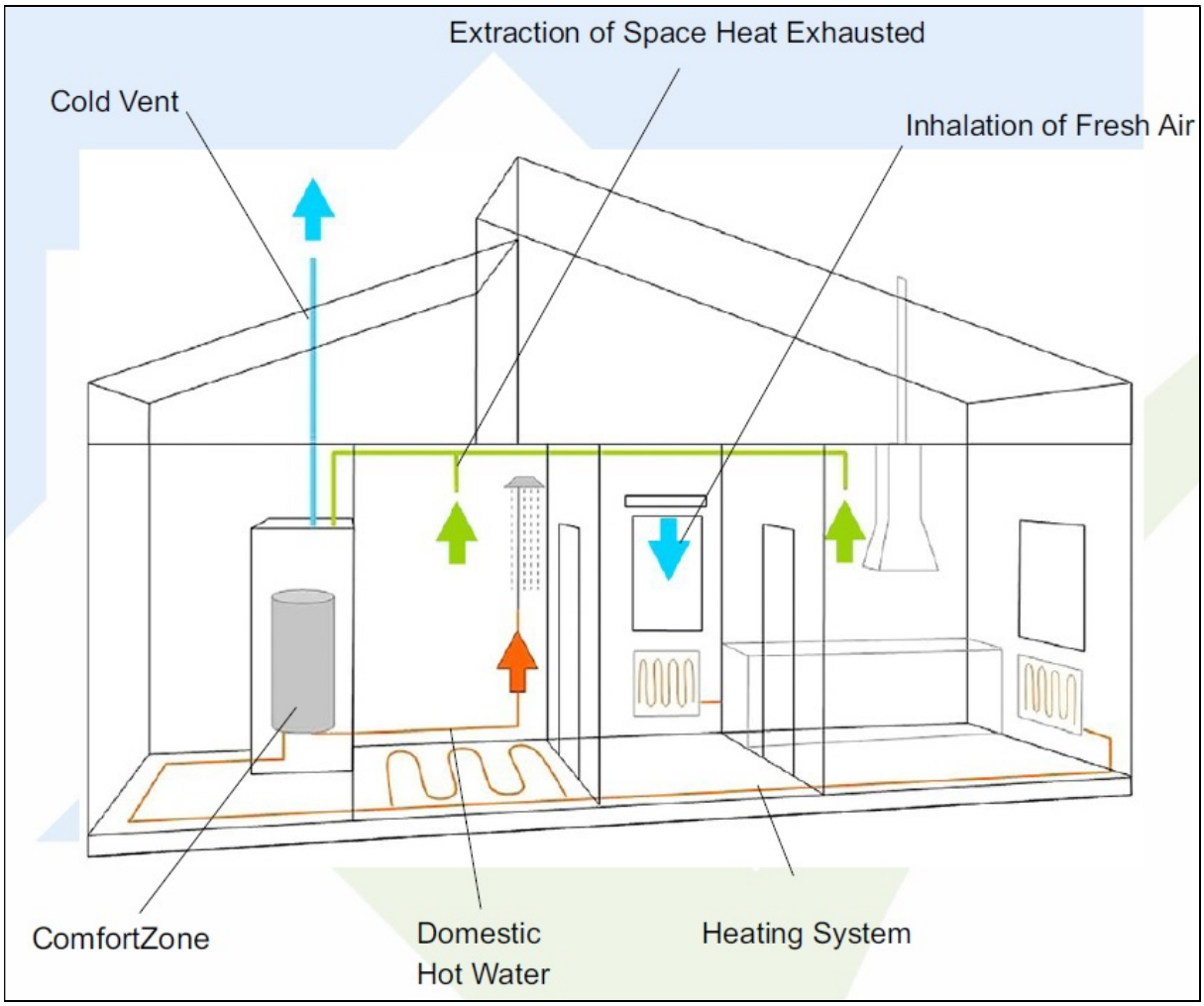

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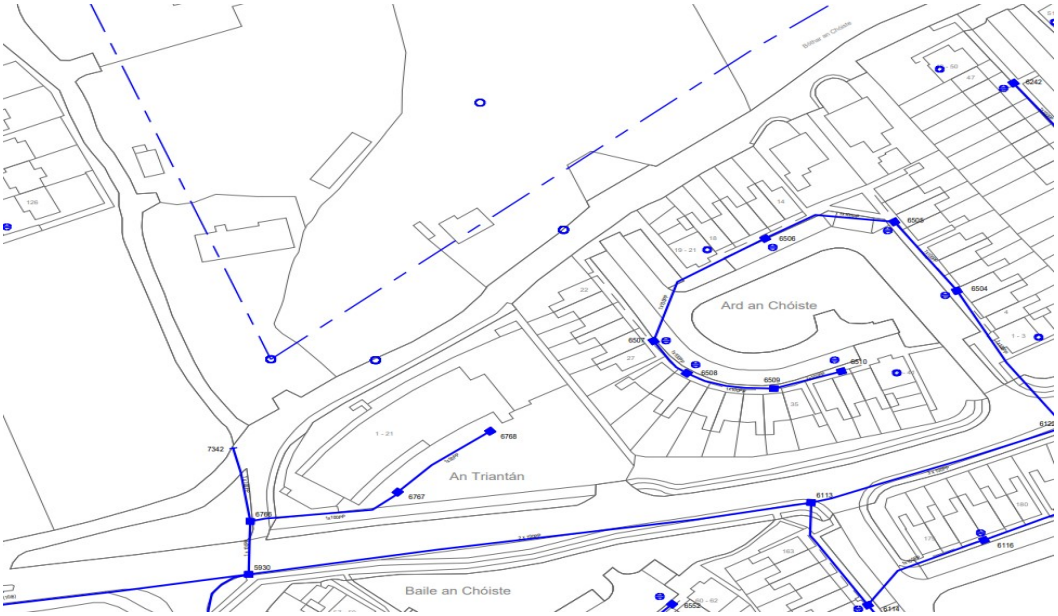

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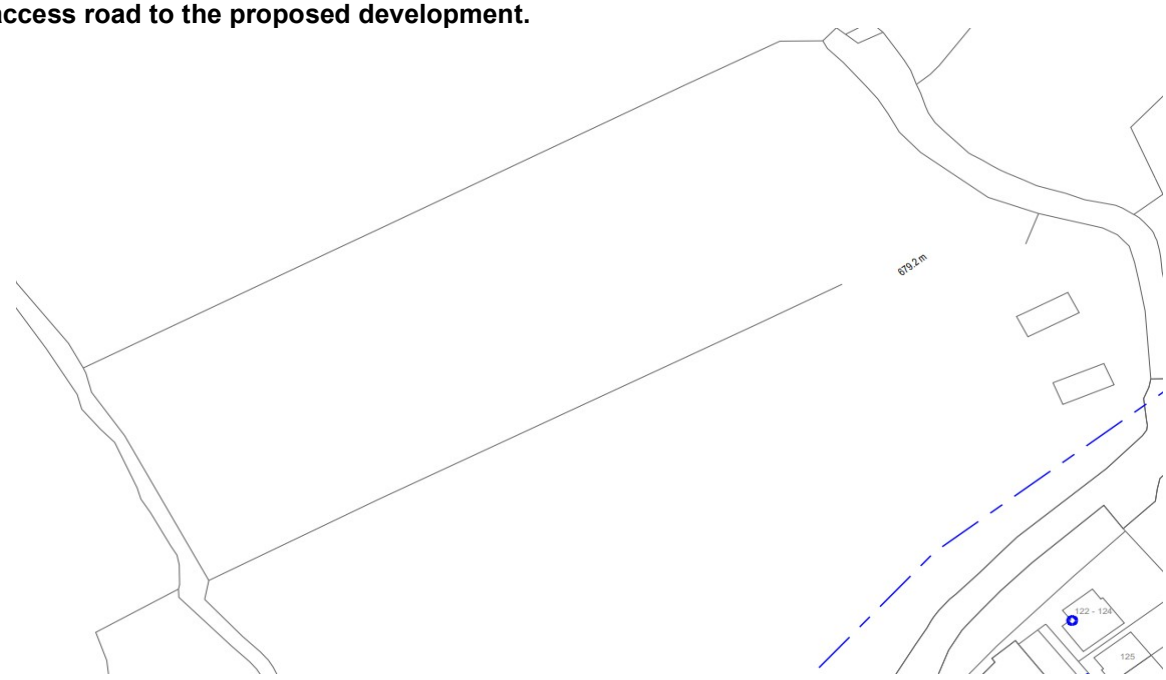

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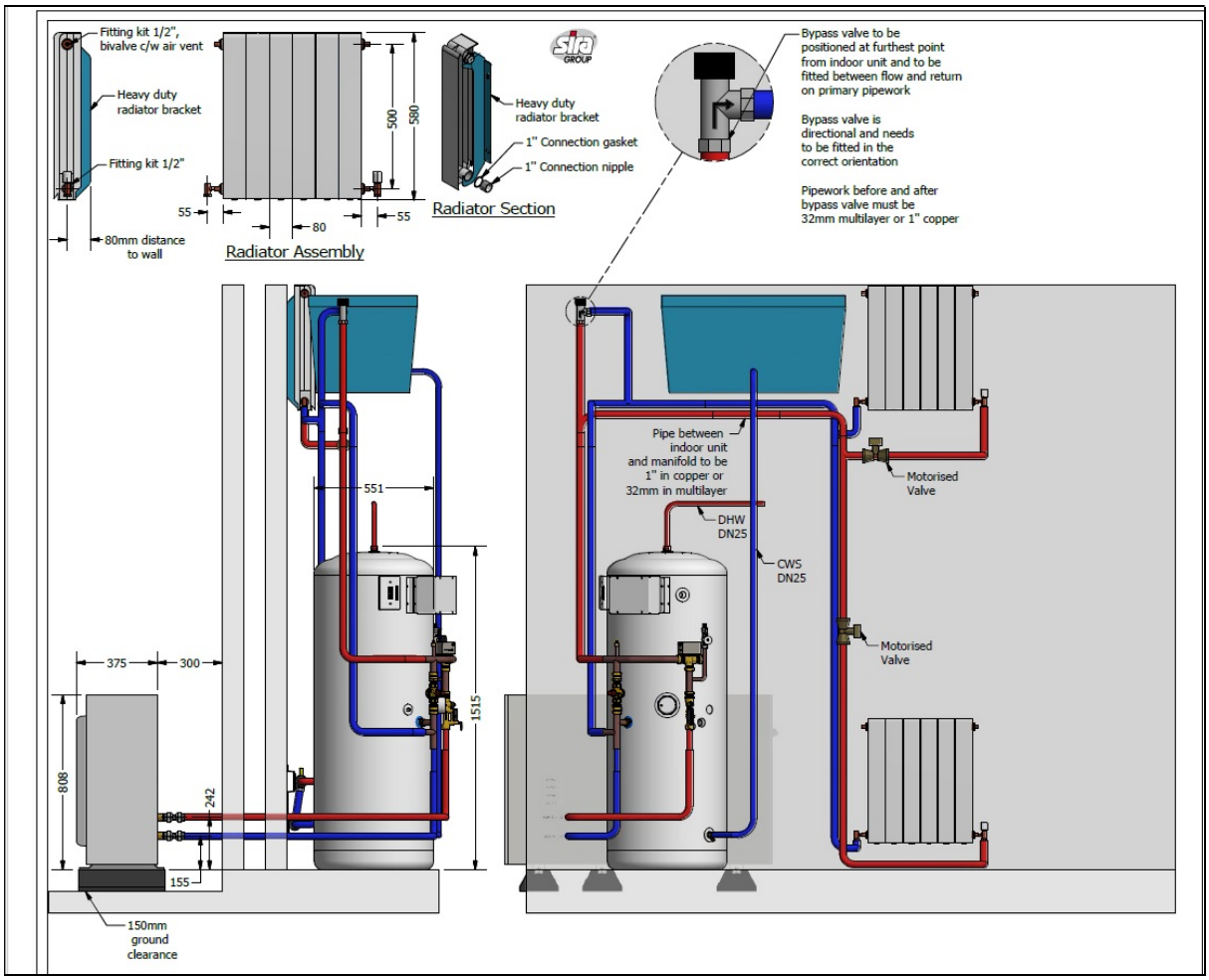

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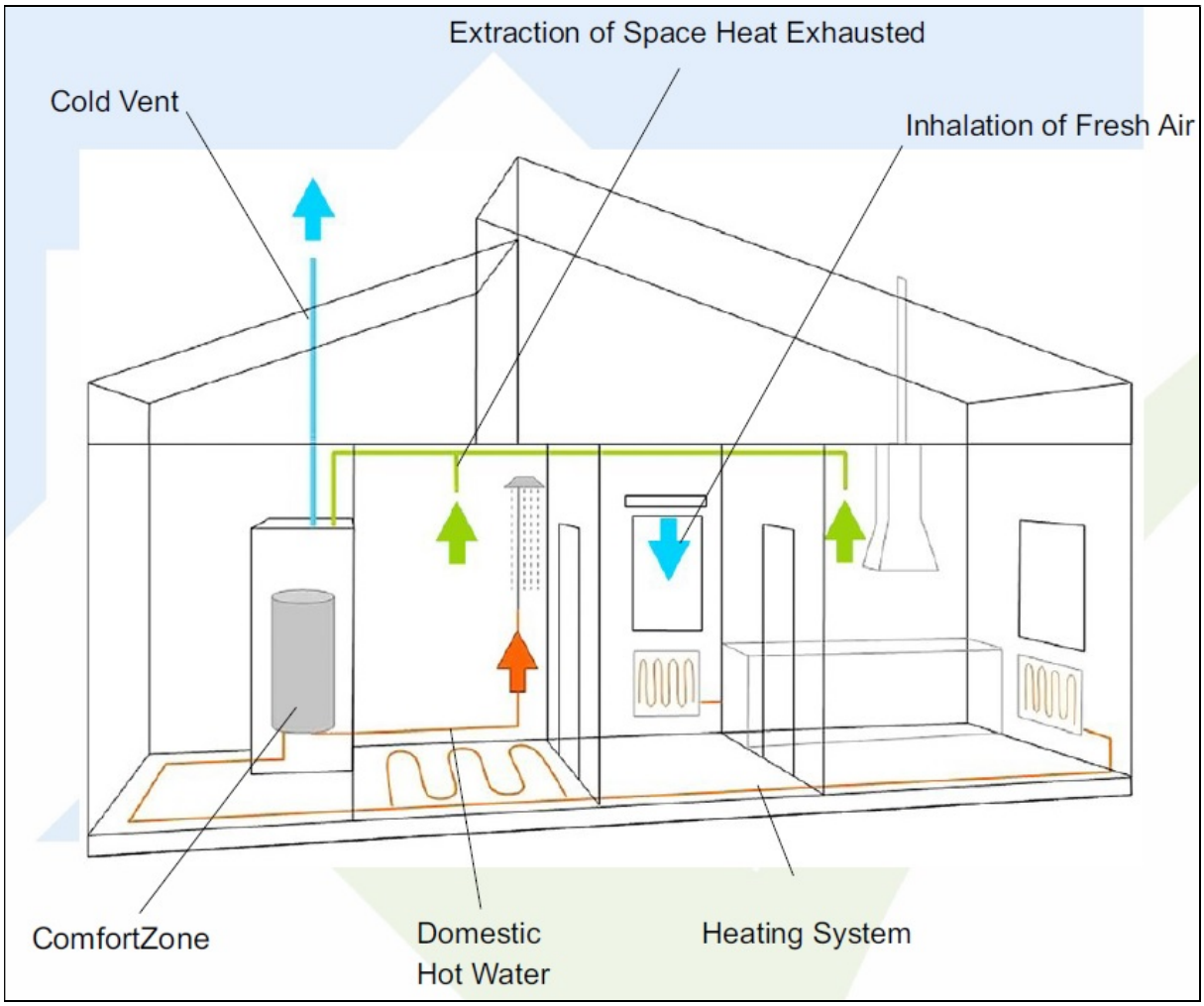

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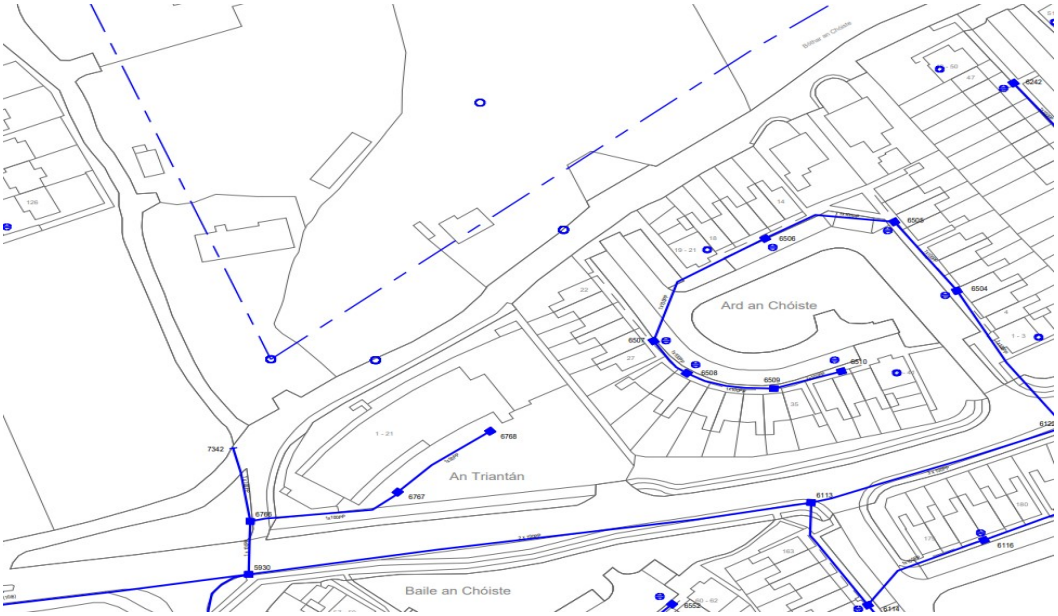

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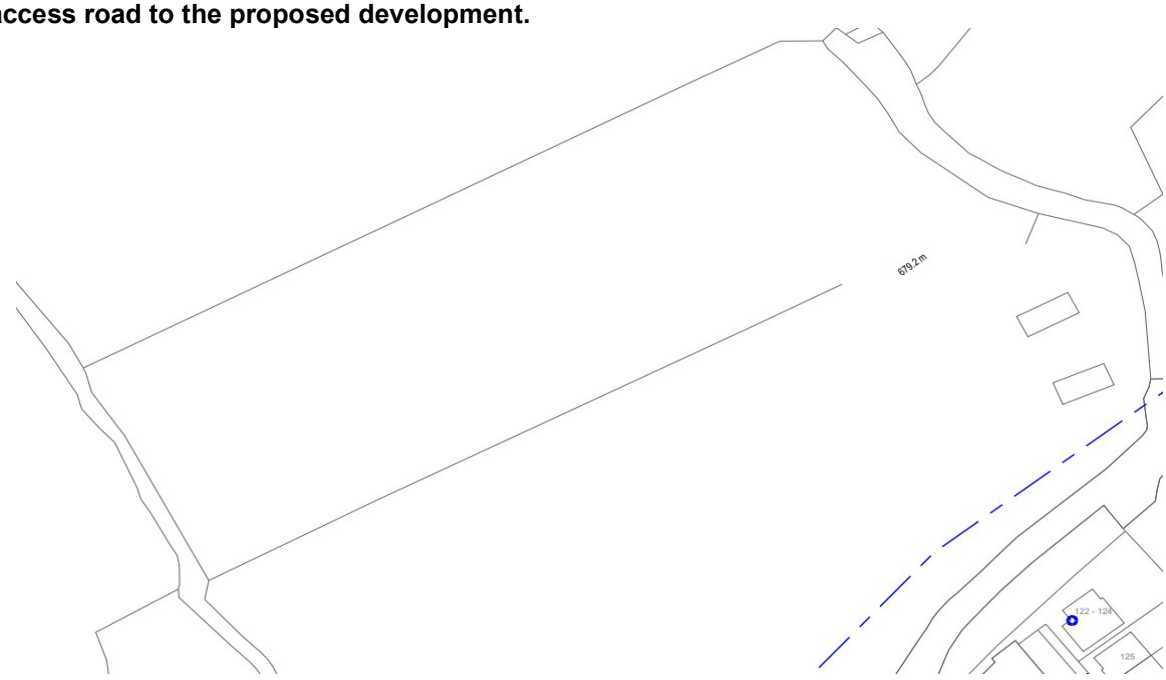

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Windows	1.2 W/m²k
Thermal Bridging Factor	0.08 (ACDs must be adhered to)

Ventilation

Ventilation Method	Demand Controlled Ventilation (DCV)
Ventilation openings	-
Air Permeability Test Result	3ac/h | 0.15 adj (assumption)

These target values shall achieve an A2 rating dwelling using a heat pump solution with no PV panels.

4.0 DESIGN INTENT FOR HOUSES AND APARTMENTS

It is proposed that the houses will be heated by means of an air to water heat pump heating systems.

It is proposed to utilize a mono-block unit to heat each individual house. The mono-block unit is A+++ rated and uses the latest R32 refrigerant gas. The unit will provide heat energy for heating and hot water generation. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required.

These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

We estimate the houses will require either 9-12kw units depending on the house type and size.

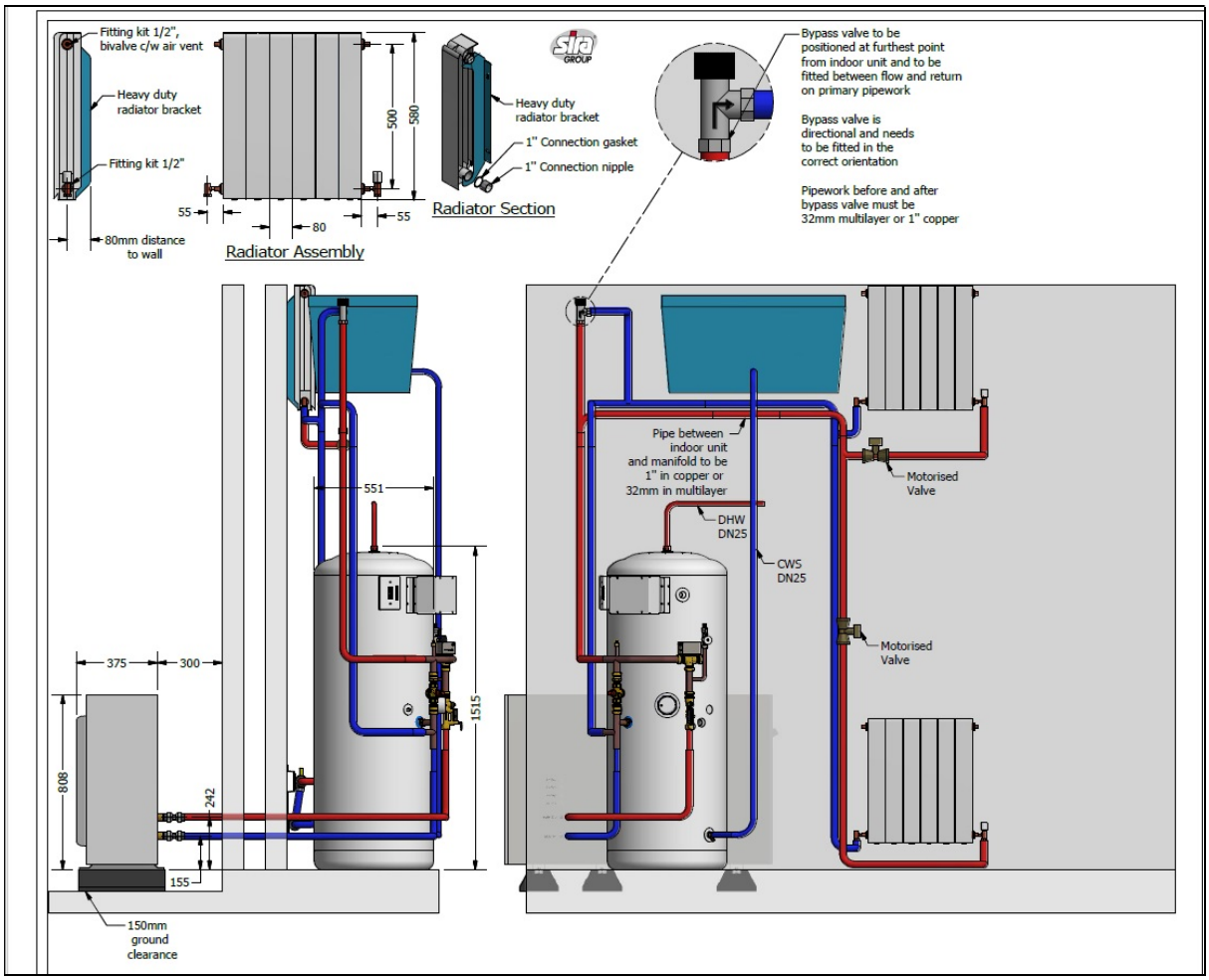
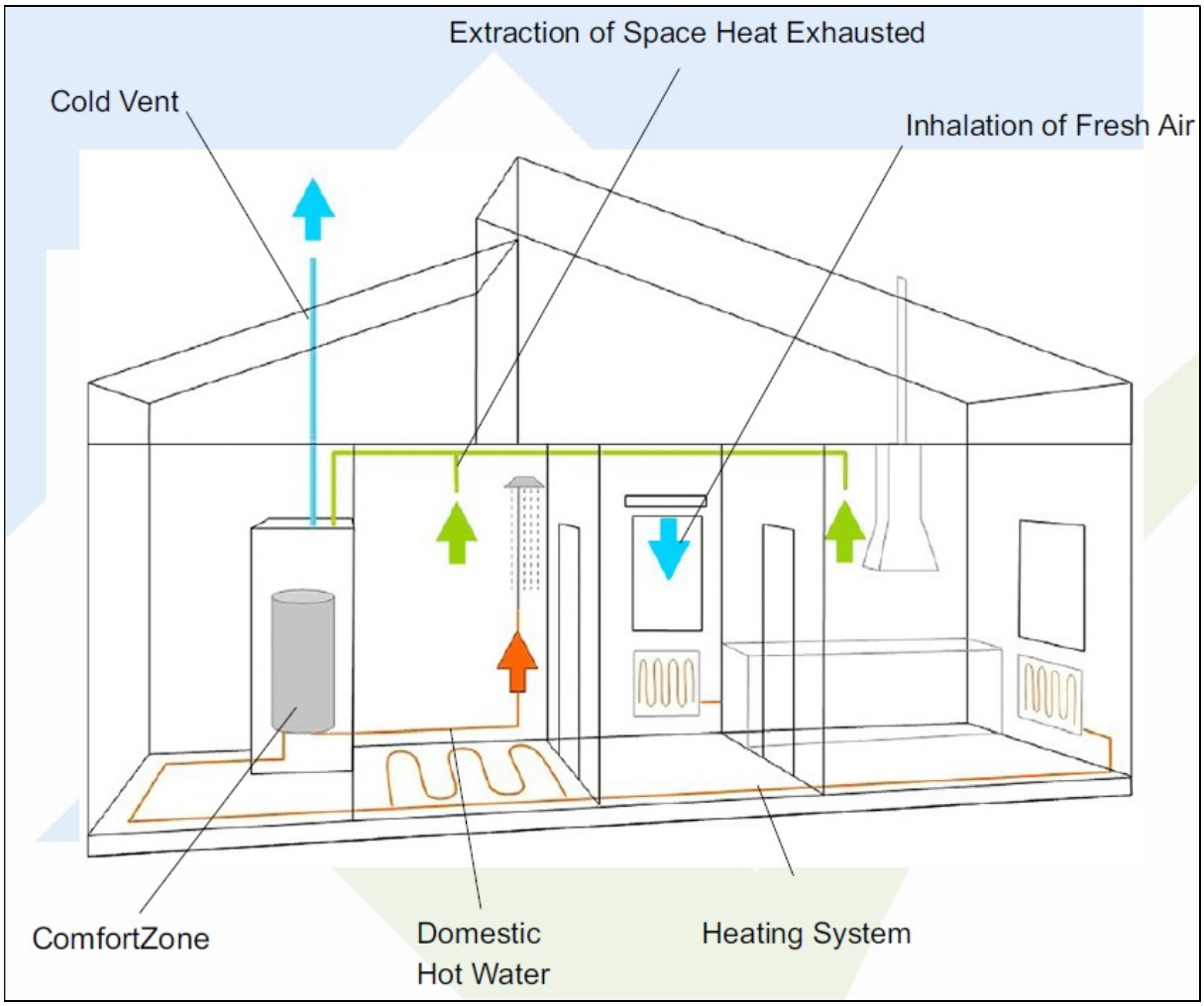


Figure 1: Proposed Heating System Schematic

The apartments will be heated by means of exhaust air heat pump systems. It is proposed to utilize exhaust air heat pumps. The unit is A++ rated. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required. These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

The unit is complete with an integral 210 litre hot water calorifier and will provide both domestic heat and hot water generation. We estimate the apartments will require a 3.5kw unit.



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External wall mounted lighting will be provided with specification to be agreed with architect.

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The LV distribution system in each unit will consist of a consumer unit in the hallway fed with a single phase 12KVA Enhanced supply to each dwelling. The new dwellings will be wired in 3C twin & earth cable.

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MOLONEYFOX
CONSULTING ENGINEERS

20.2068

MECHANICAL AND ELECTRICAL SERVICES REPORT
BRODERICK BOTHAR NA CHOISTE Res SHD
GALWAY

DATE: 22/06/2022

Moloney Fox Consulting Limited
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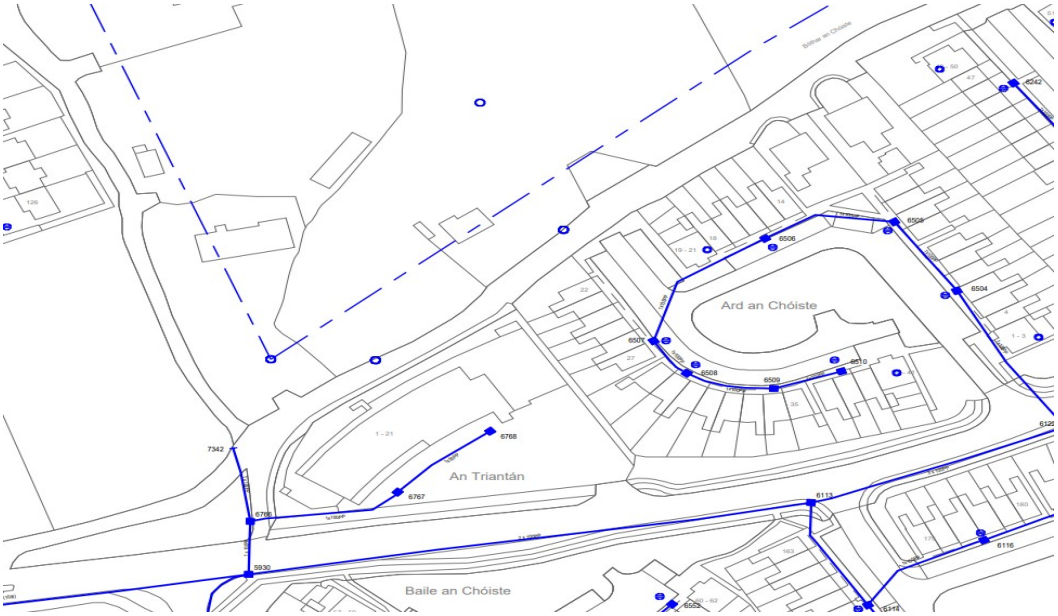

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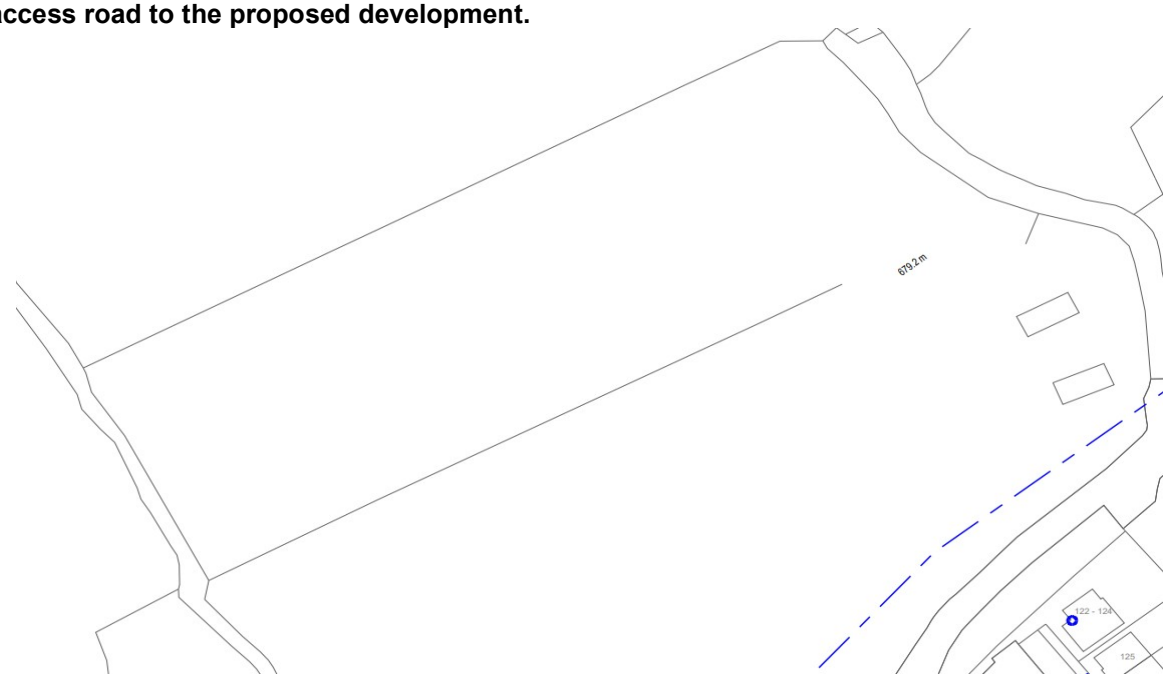

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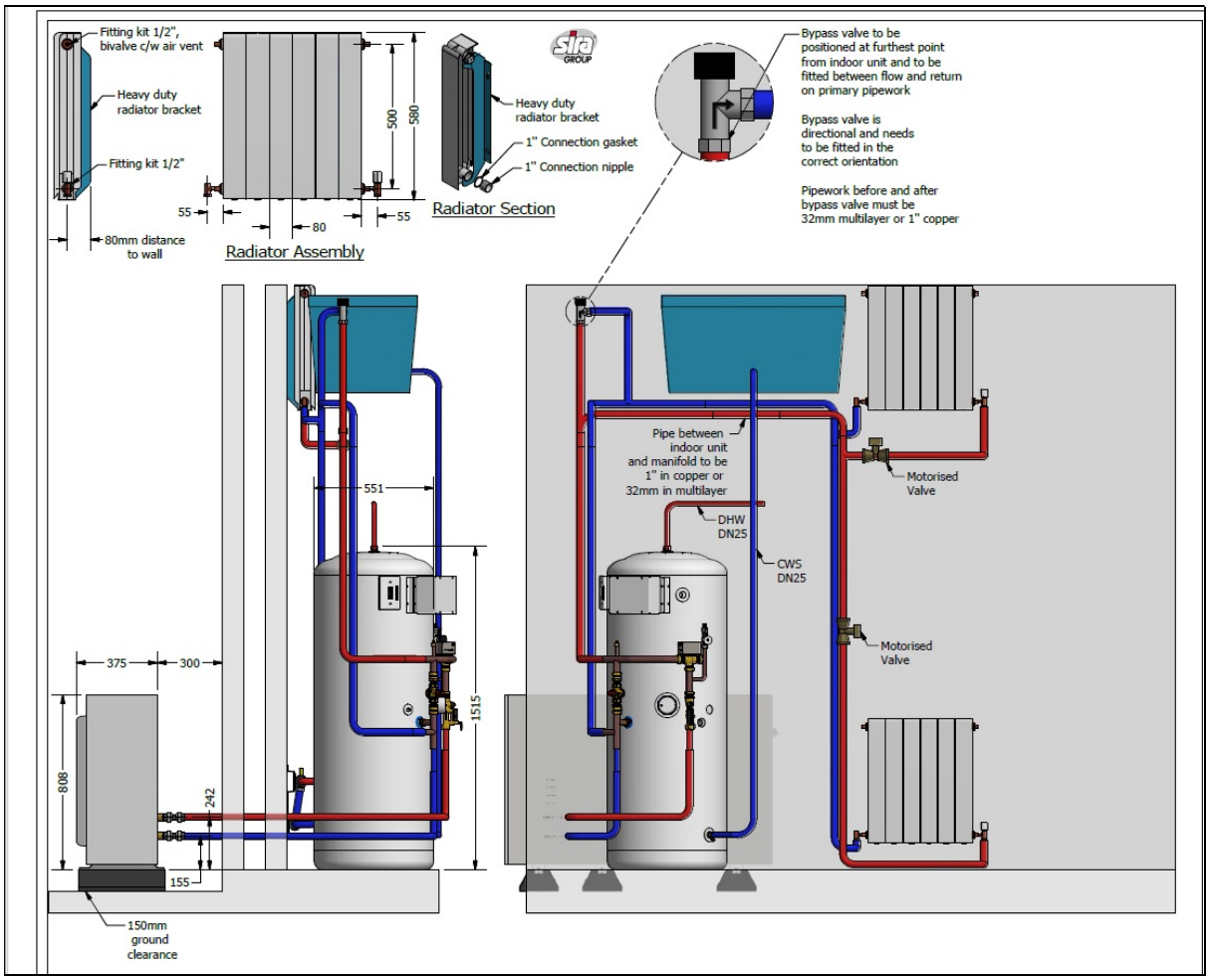

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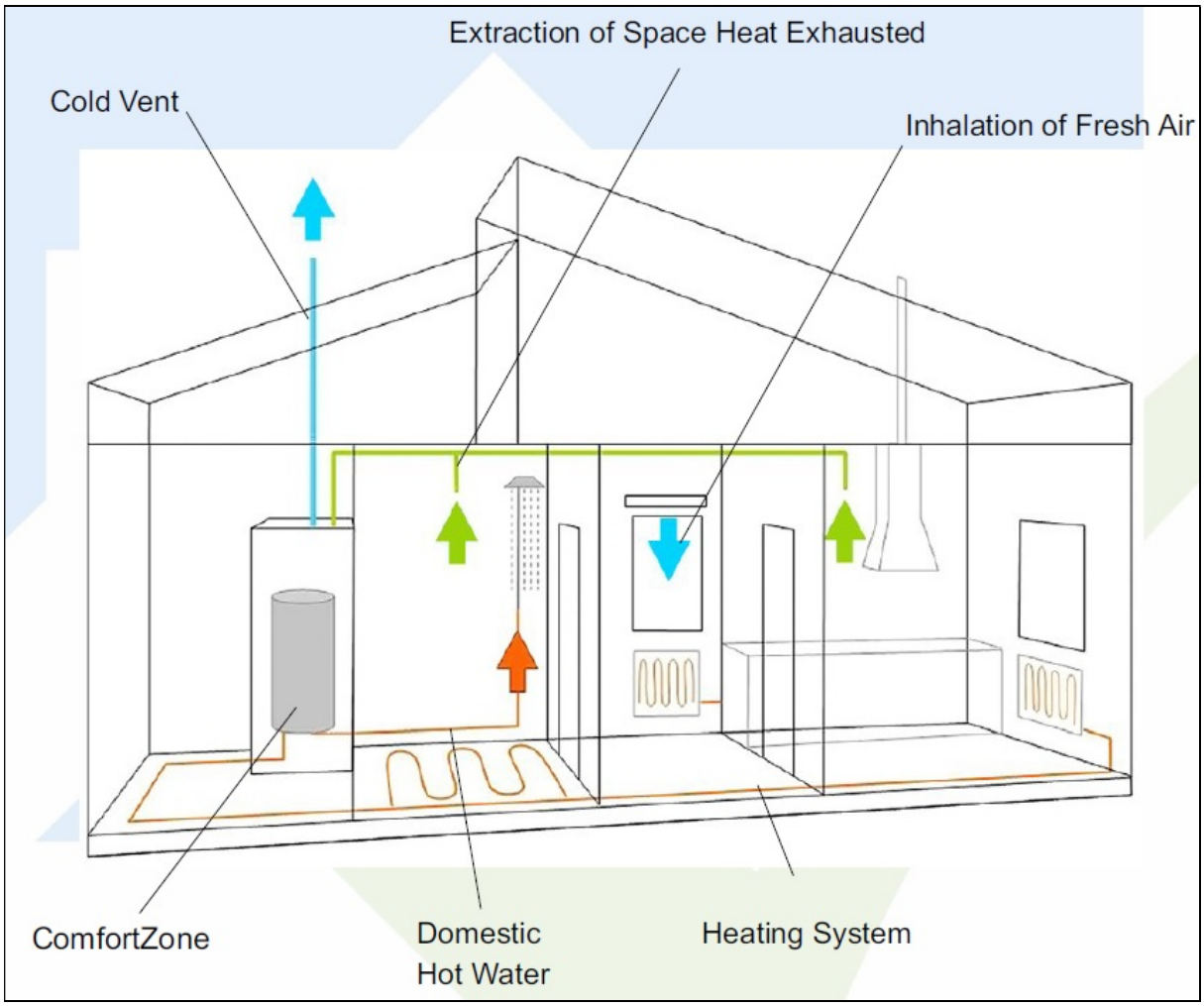

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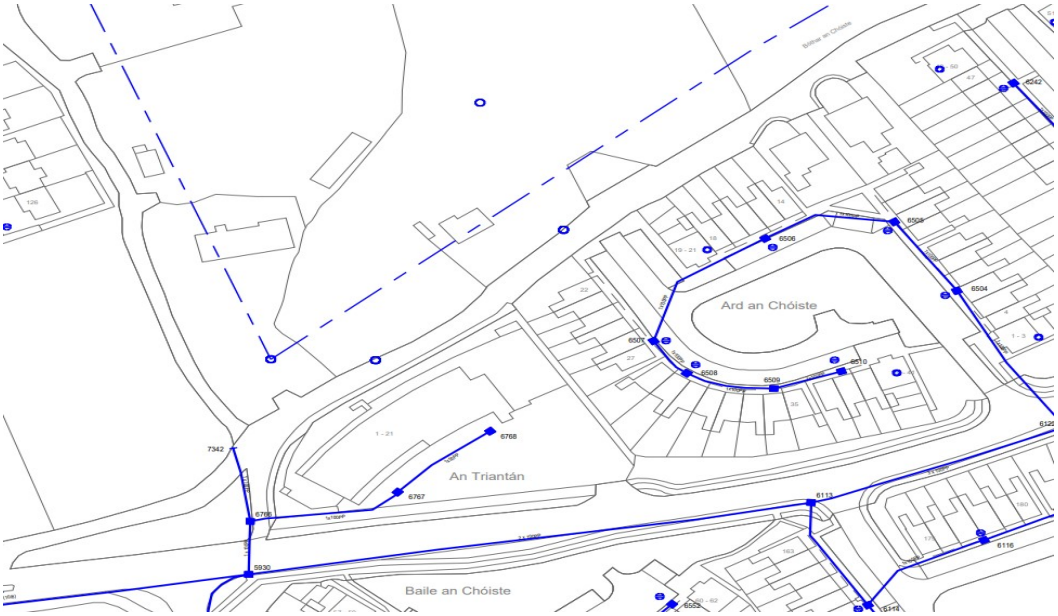

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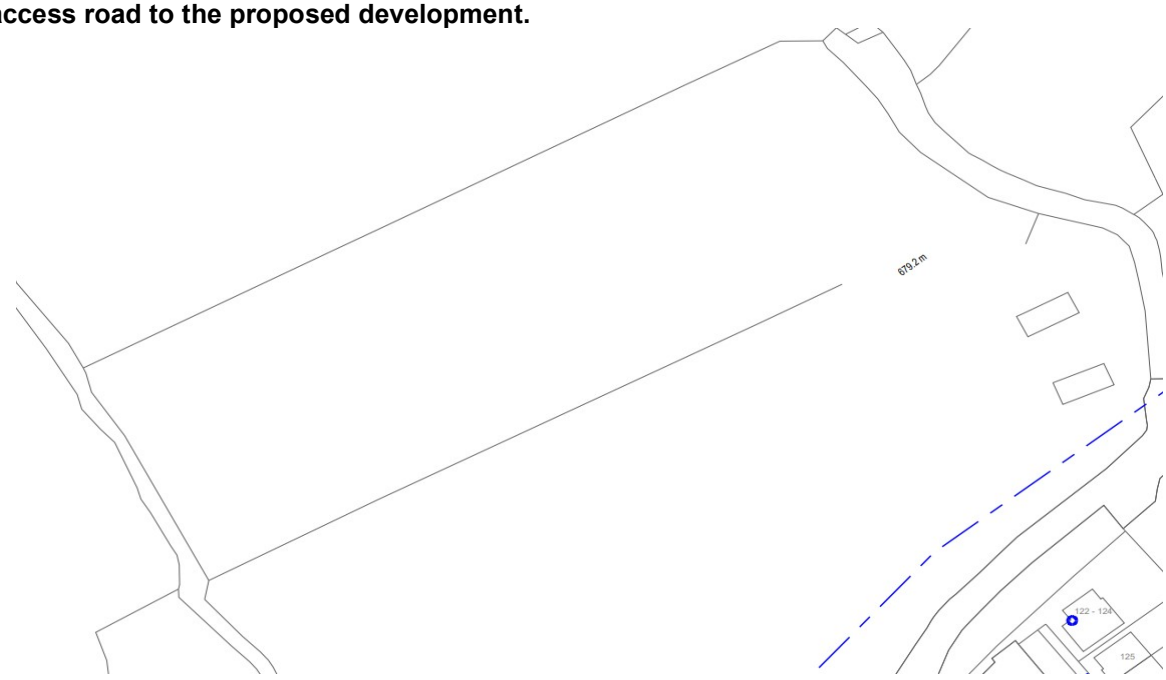

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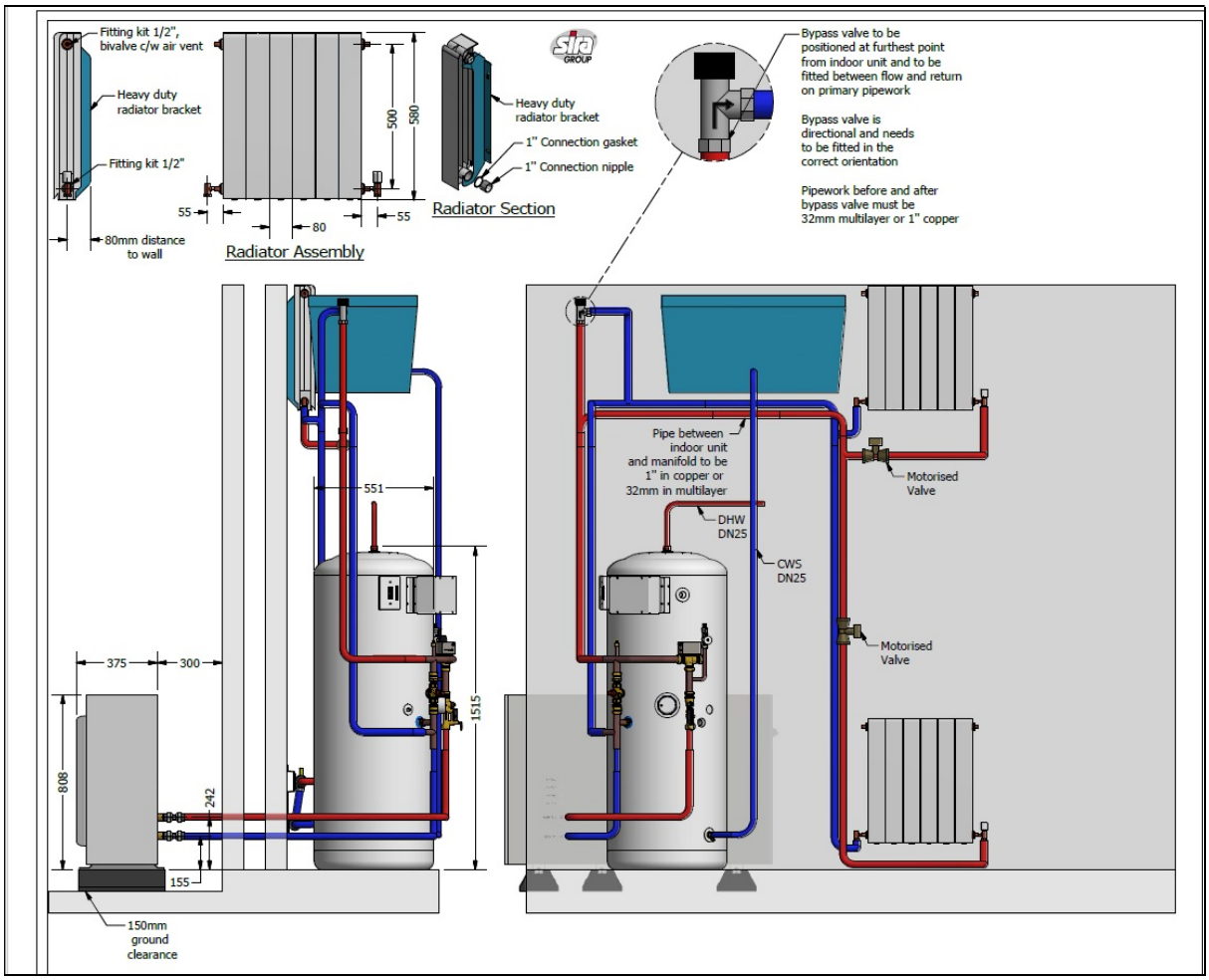

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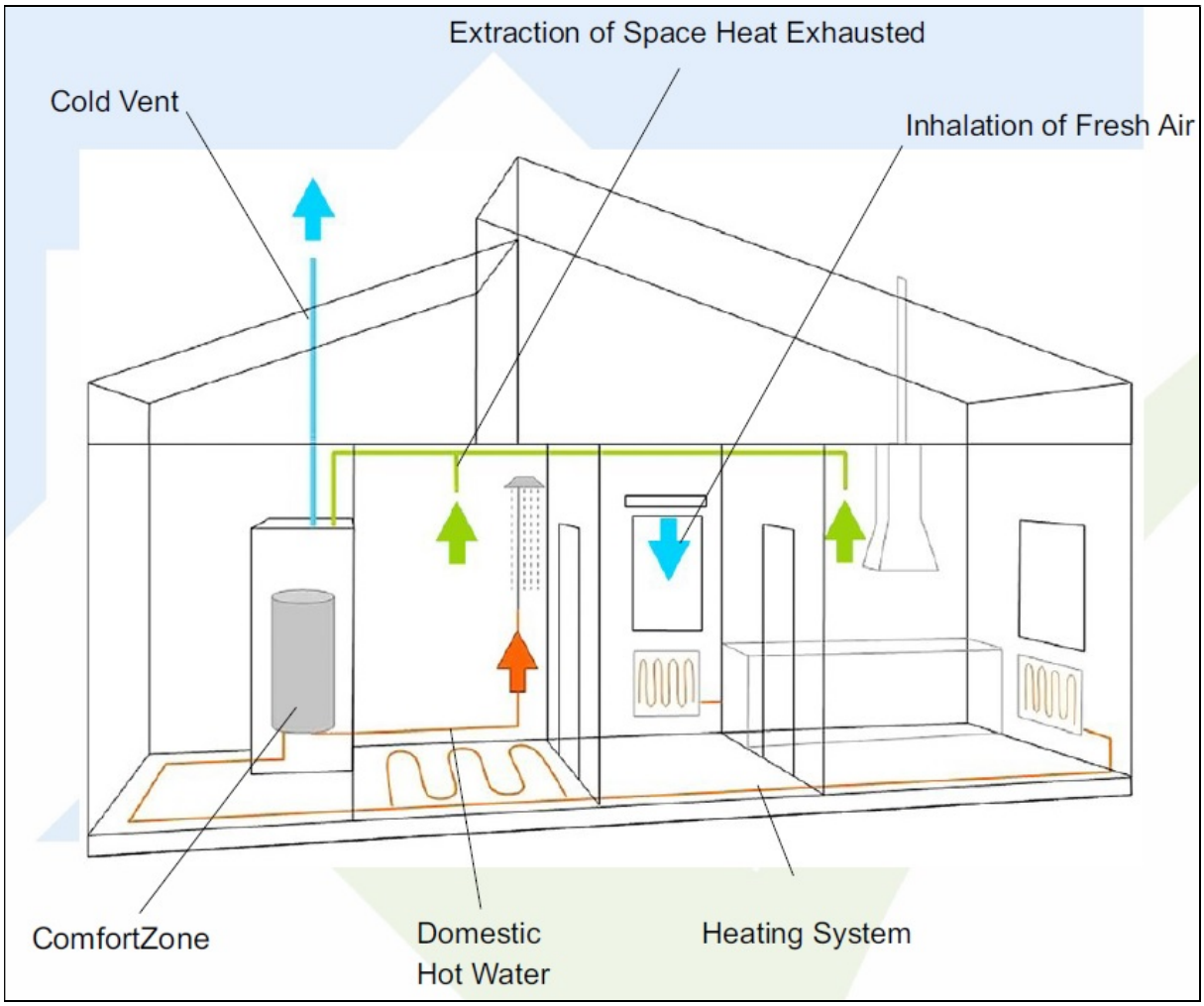

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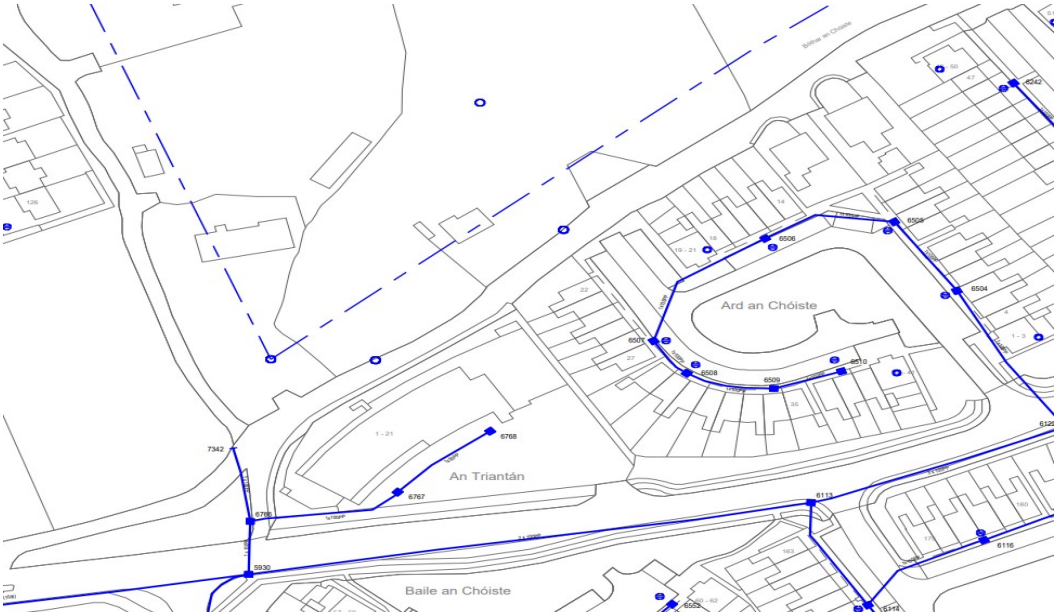

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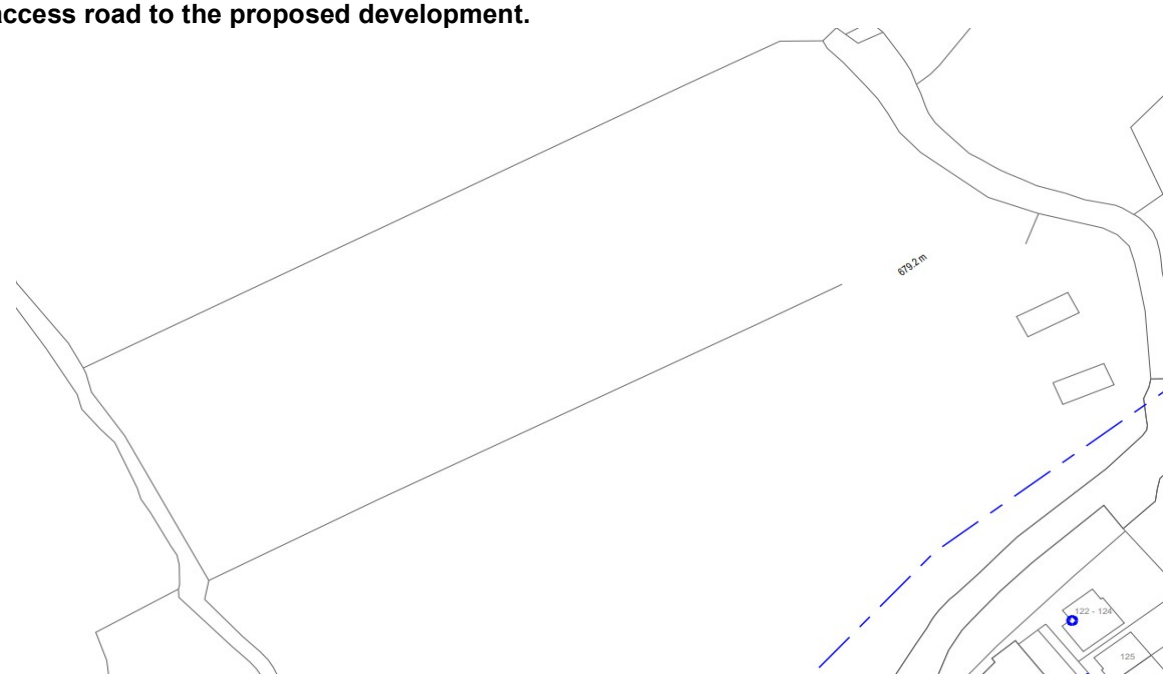

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These target values shall achieve an A2 rating dwelling using a heat pump solution with no PV panels.

4.0 DESIGN INTENT FOR HOUSES AND APARTMENTS

It is proposed that the houses will be heated by means of an air to water heat pump heating systems.

It is proposed to utilize a mono-block unit to heat each individual house. The mono-block unit is A+++ rated and uses the latest R32 refrigerant gas. The unit will provide heat energy for heating and hot water generation. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required.

These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

We estimate the houses will require either 9-12kw units depending on the house type and size.

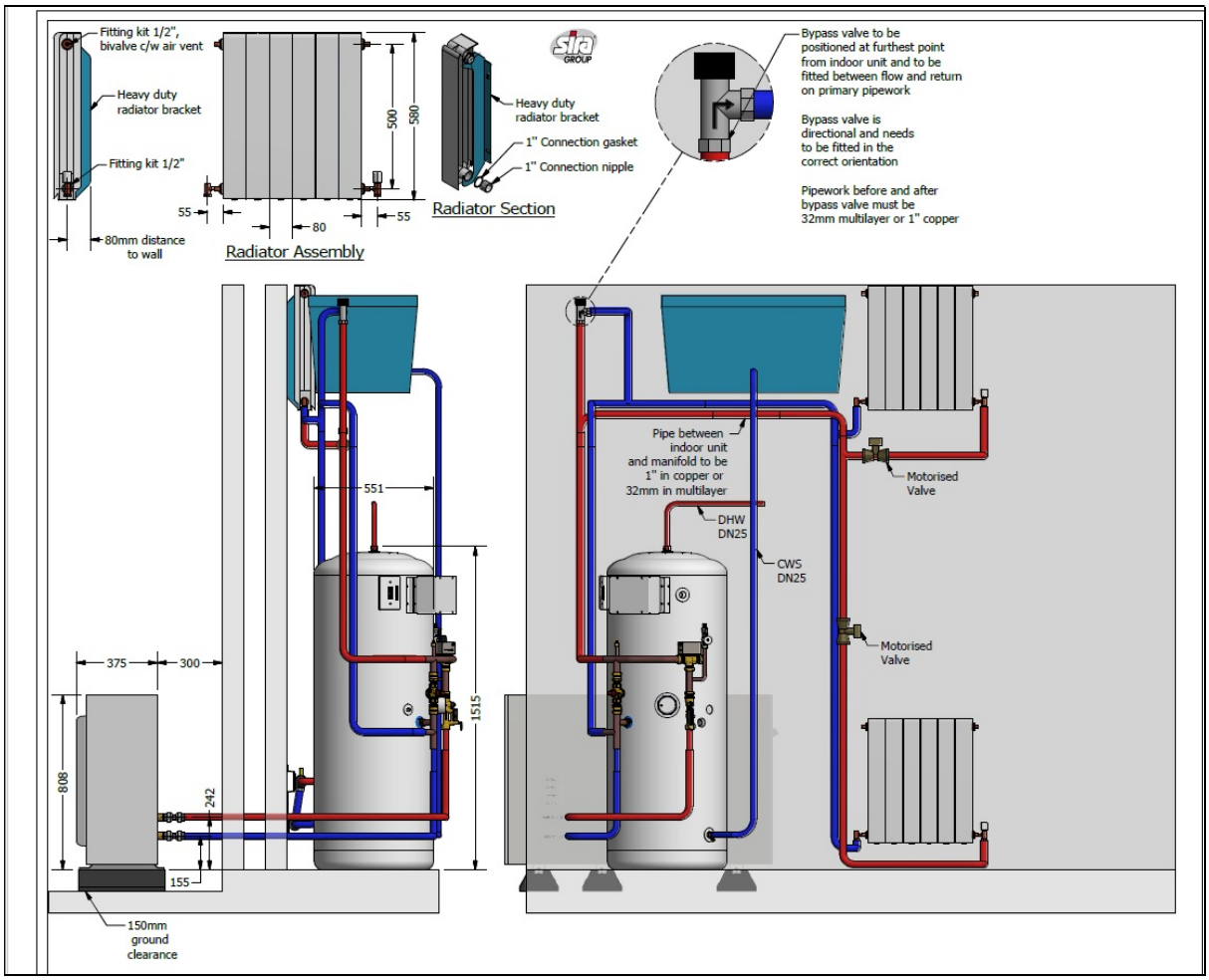

Figure 1: Proposed Heating System Schematic

The apartments will be heated by means of exhaust air heat pump systems. It is proposed to utilize exhaust air heat pumps. The unit is A++ rated. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required. These radiators are specifically designed to work with low temperature heating systems and have quicker heat up periods and transfer rates than standard steel panel radiators.

The unit is complete with an integral 210 litre hot water calorifier and will provide both domestic heat and hot water generation. We estimate the apartments will require a 3.5kw unit.

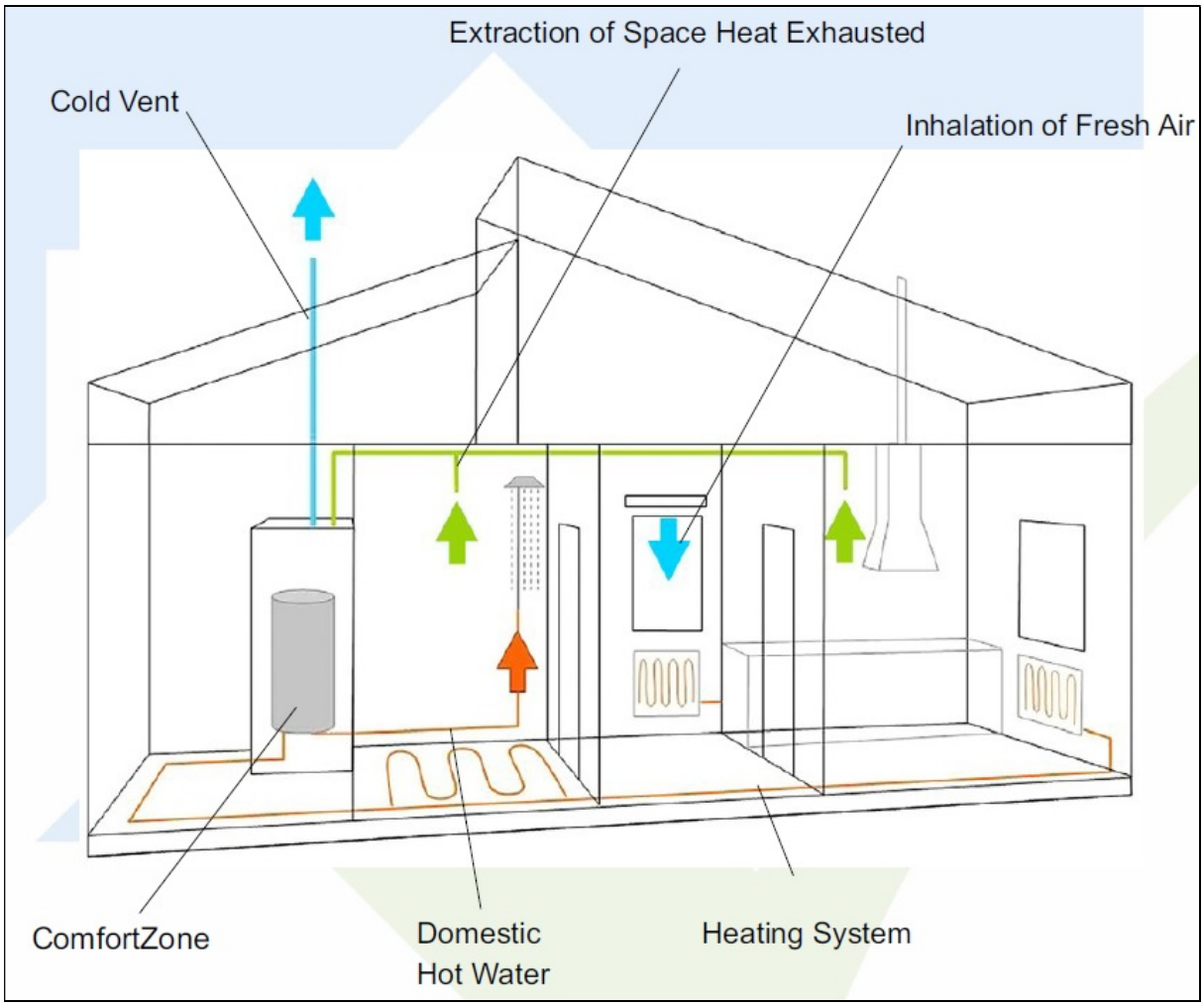

Figure 2: Proposed Heating System Schematic

We have carried out some preliminary BER calculations for some typical house types and we are achieving in general an A2 BER rating and compliance with Part L using a heat pump solution and in some cases PV's.

The water services installation in the houses will be gravity pressurized systems as requested by the client. Typical a Format 30 Cold water storage tank will be installed at high level in the attic space and this will service the cold-water outlets and cold feed to the hot water cylinder. Mains, cold and hot water shall be provided as required to all fixtures and fittings.

The hot water storage calorifier will be 210 litres in capacity and will be heated by the air to water heat pump c/w immersion back-up. Thermostatic Mixing Valves (TMVs) will be provided at all hot water outlets to comply with department regulations for the design of social housing.

The water services installations in the apartments will be pressurized systems. Domestic water storage tanks complete with integral pressurization pumps will be provided in each apartment. Mains, cold and hot water shall be provided as required to all fixtures and fittings.

Hot Water will be generated by the exhaust air heat pump unit which has a built in 210 litre hot water calorifier.

The ventilation requirements for the houses will be met using a low maintenance Aereco demand control ventilation system. This system utilizes an central house extract fan and passive supply vents with mechanical humidity control around the house. Each house will be individually serviced.

Ventilation in the apartments will be achieved the Exhaust air heat pump unit. This unit will extract air from the apartment bathroom and kitchen areas and will draw in fresh air to the unit via wall or window vents.

The electrical site services will include provisions for new EIR, ESB. Public lighting, Pedestrian Crossing Lighting.

The residential house and apartment units will be provided with a suitable number of electrical services to cater for today's needs.

External wall mounted lighting will be provided with specification to be agreed with architect.

The fire alarm system for the houses and Apartments will be a LD2 domestic type consisting of mains fed smoke, heat and carbon monoxide monitors with battery backup.

The LV distribution system in each unit will consist of a consumer unit in the hallway fed with a single phase 12KVA Enhanced supply to each dwelling. The new dwellings will be wired in 3C twin & earth cable.

There shall be 1no. incoming EIR supply to each unit to facilitate telephone and broadband services.

MOLONEYFOX
CONSULTING ENGINEERS

20.2068

MECHANICAL AND ELECTRICAL SERVICES REPORT
BRODERICK BOTHAR NA CHOISTE Res SHD
GALWAY

DATE: 22/06/2022

Moloney Fox Consulting Limited
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1.0 ESB SERVICES

The local ESB medium voltage infrastructure has the capacity to cater for the proposed development. The medium voltage infrastructure shall be extended via underground ducts from the An Triantan Ground Mounted Substation located at the shopping centre.

This extension of the ESB infrastructure has been agreed in consultation with the developer and ESB Network Engineers.

The development shall be served using 2no. ground mounted transformers, mini pillars and micro pillars. The residential units shall be fed from local mini pillars, with public lighting fed from micro pillars. This is a typical arrangement for residential projects.

The ESB Infrastructure including ESB mini pillars shall cater for electric car charging points in car park areas.

There are no ESB overhead cables in the vicinity of the site that require diversions.

With regards to the local ESB services to each dwelling and apartment, provision shall be made to deliver adequate services to each dwelling and apartment to cater for both the electrical needs of the unit in terms of power for heat pumps and electrical car charging facilities.

Fig 1: Existing Ground Mounted Sub Station for medium voltage connection

Fig 2. ESB Record Drawing that indicates no overhead cable diversions required.

2.0 EIR SERVICES

The existing EIR infrastructure currently runs overhead along the site boundary. In order to service this development, a new service shall be derived from the Eir network located at junction of the An Triantan Shopping Centre via underground ducts.

The proposed ducting shall be extended with the ESB ducting and any public Utilities ducting that maybe required along this road. This service shall provide both voice and broadband communications to the development to cater for residents needs. Within the development, the ducting system shall be brought to each dwelling and apartment block.

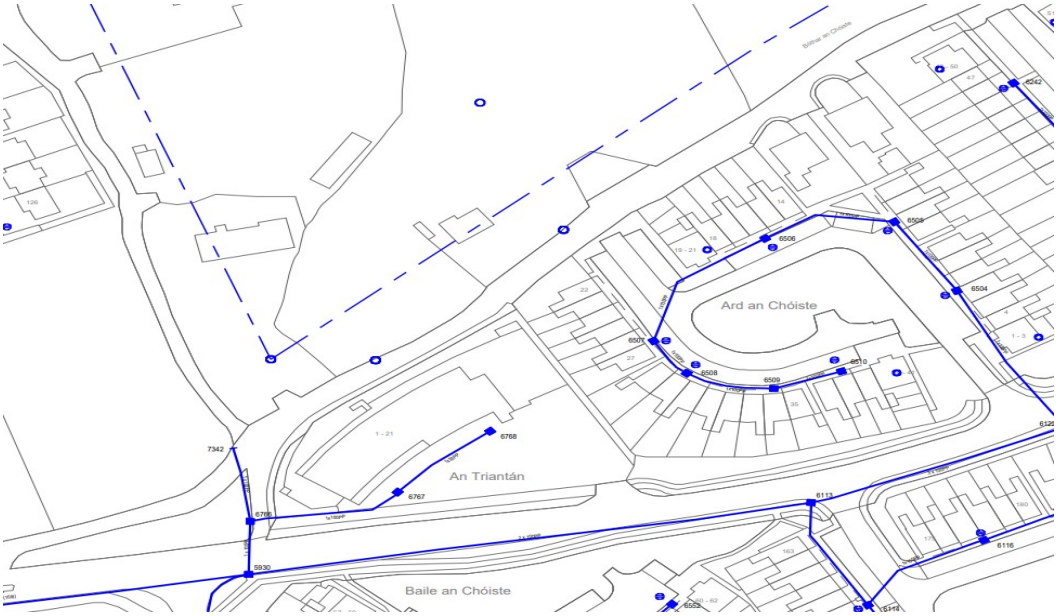

Fig 3 – Existing underground duct network at An Triantan and overhead network along the access road to the proposed development.

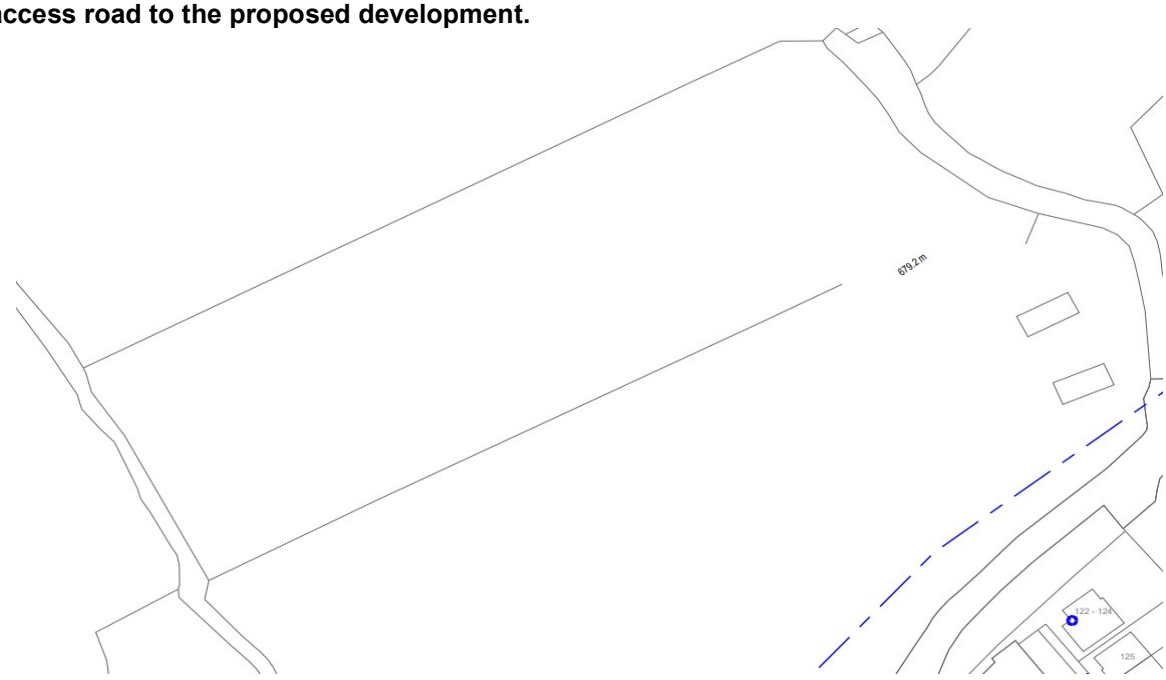

Fig 4 – Existing overhead cables traversing the site that will be undergrounded.

3.0 NZEB REQUIREMENTS

The Definition: 'Nearly Zero Energy Buildings', nZEB means a building that has a very high energy performance where the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources including energy from renewable sources produced on-site or nearby".

In order to achieve this, a target of 20% Renewables Energy Ratio (RER) has been set as the NZEB energy from renewable sources onsite or nearby target. The software tool provided by SEAI will be provided to support the calculation of the RER. It is recognised that in certain confined situations it may not be possible to achieve the full 20% RER.

In addition to the reduced energy usage, all new buildings must generate 20% of their energy from renewable energy sources, although this may be reduced to 10% where the energy performance of the building is more than 10% better than the reference building. This option of further reducing energy use is likely to be selected for most buildings.

As part of the design process, consideration shall be taken in account with regards to the requirements of nZEB to ensure the building meets with its requirements.

The 20% or 10% requirement can be provided by Heat Pumps or Heat pumps / PV's.

The building will be constructed to meet the latest building regulations and U-Values for each element of the envelope:

Building Fabric / Specification

Floor	0.12 W/m²k
Walls	0.18 W/m²k
Roof	0.15 W/m²k
Doors	1.6 W/m²k
Windows	1.2 W/m²k
Thermal Bridging Factor	0.08 (ACDs must be adhered to)

Ventilation

Ventilation Method	Demand Controlled Ventilation (DCV)
Ventilation openings	-
Air Permeability Test Result	3ac/h | 0.15 adj (assumption)

These target values shall achieve an A2 rating dwelling using a heat pump solution with no PV panels.

4.0 DESIGN INTENT FOR HOUSES AND APARTMENTS

It is proposed that the houses will be heated by means of an air to water heat pump heating systems.

It is proposed to utilize a mono-block unit to heat each individual house. The mono-block unit is A+++ rated and uses the latest R32 refrigerant gas. The unit will provide heat energy for heating and hot water generation. Aluminium radiators will be provided in each space complete with thermostatic radiator valves (TRVs) as required.

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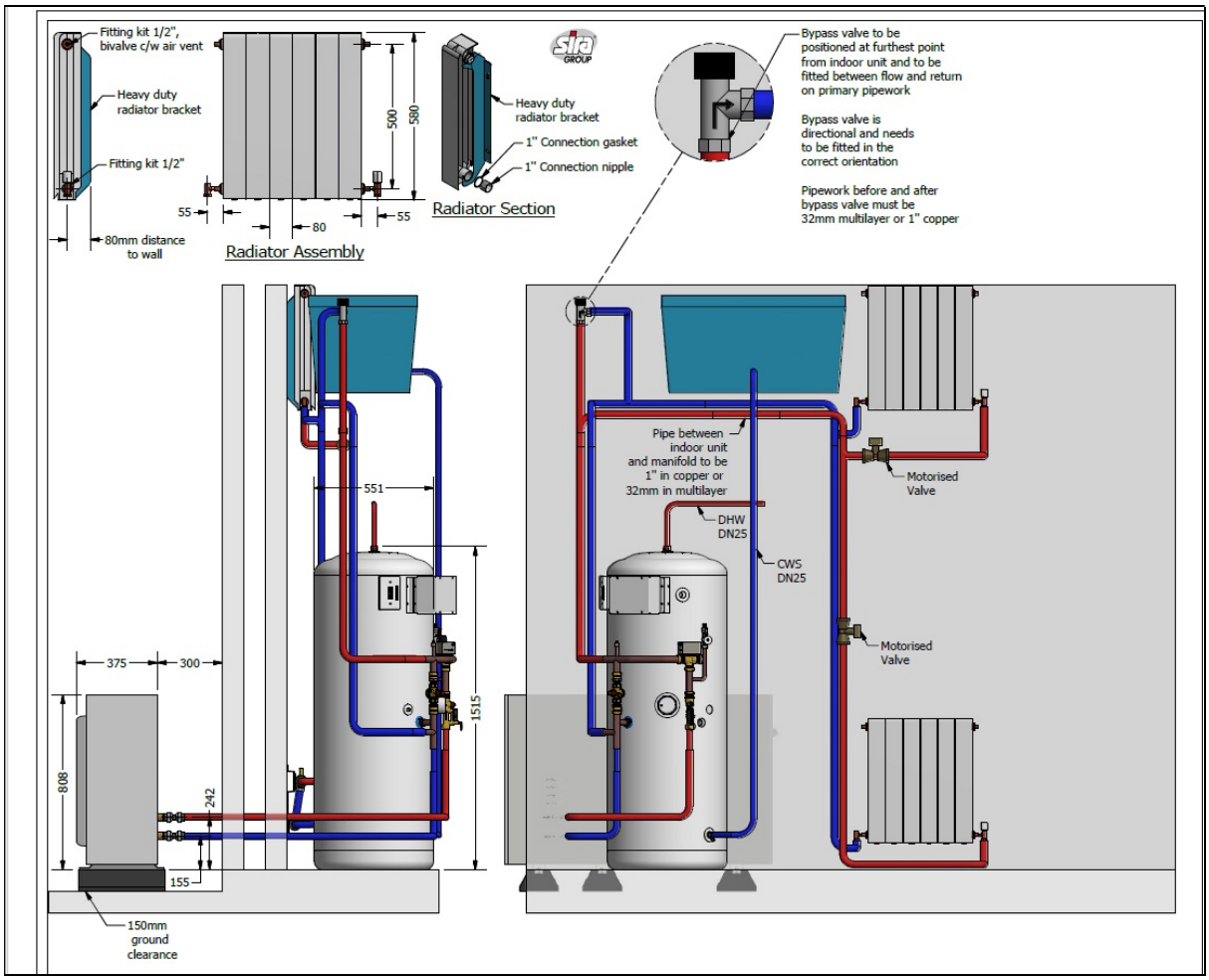

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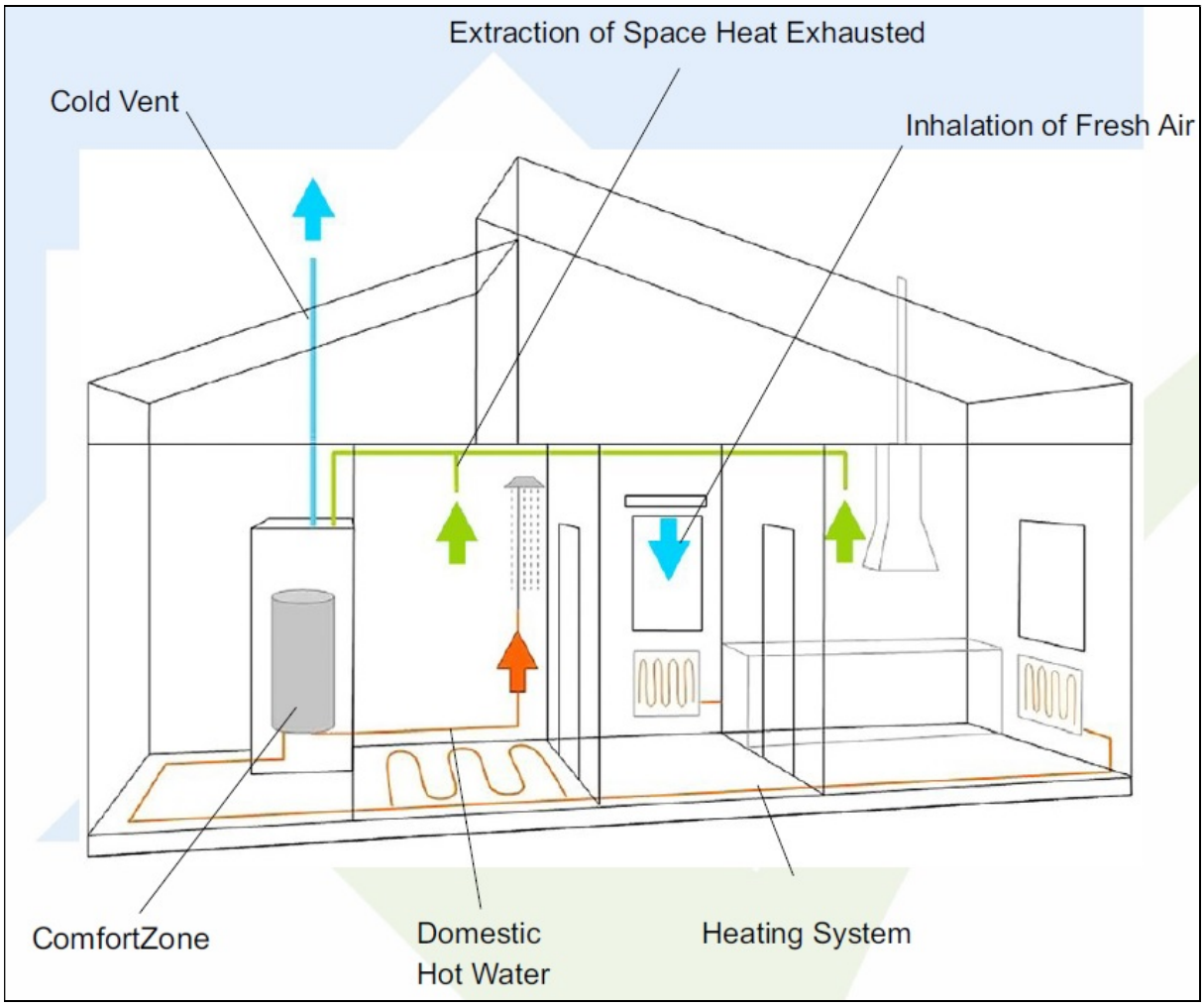

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There are no ESB overhead cables in the vicinity of the site that require diversions.

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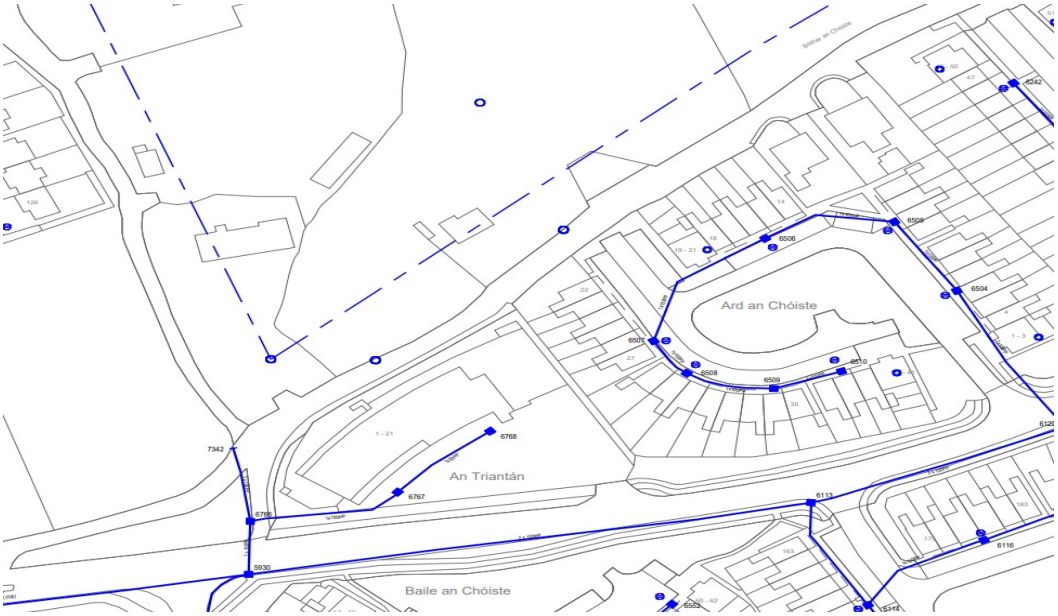

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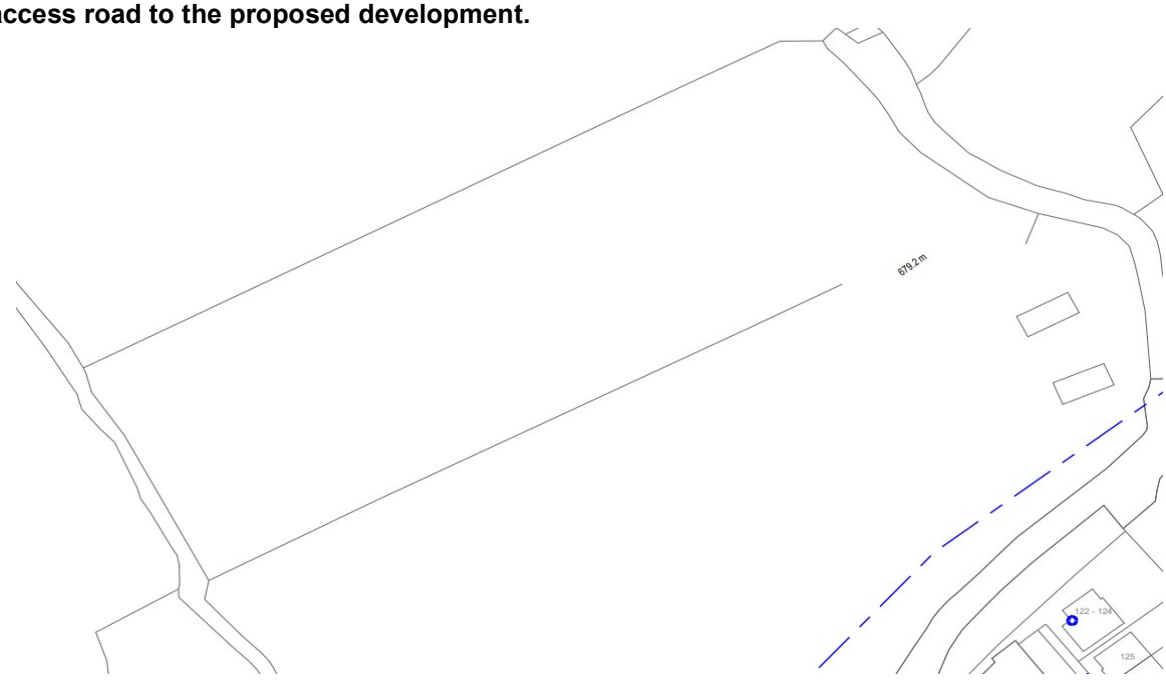

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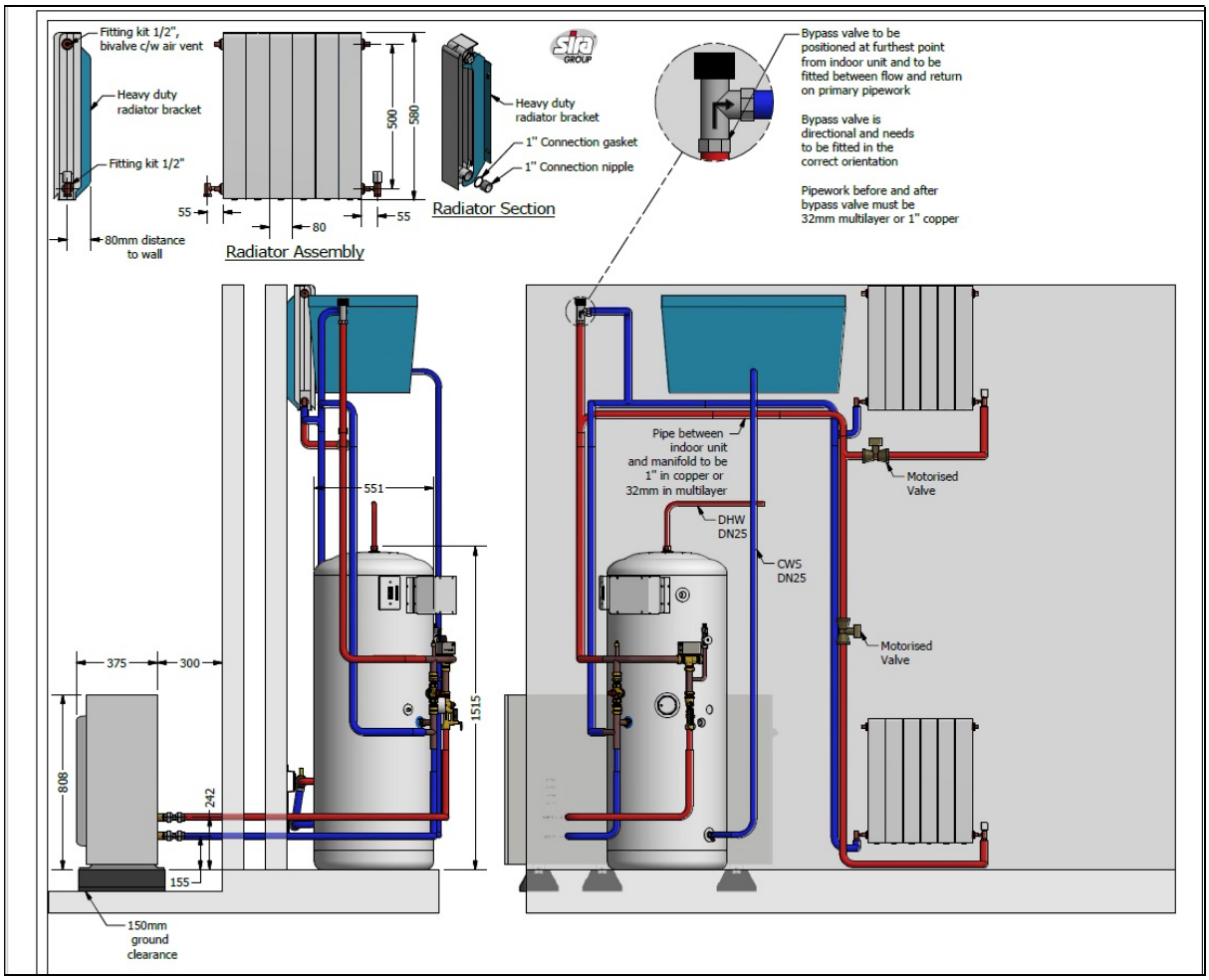

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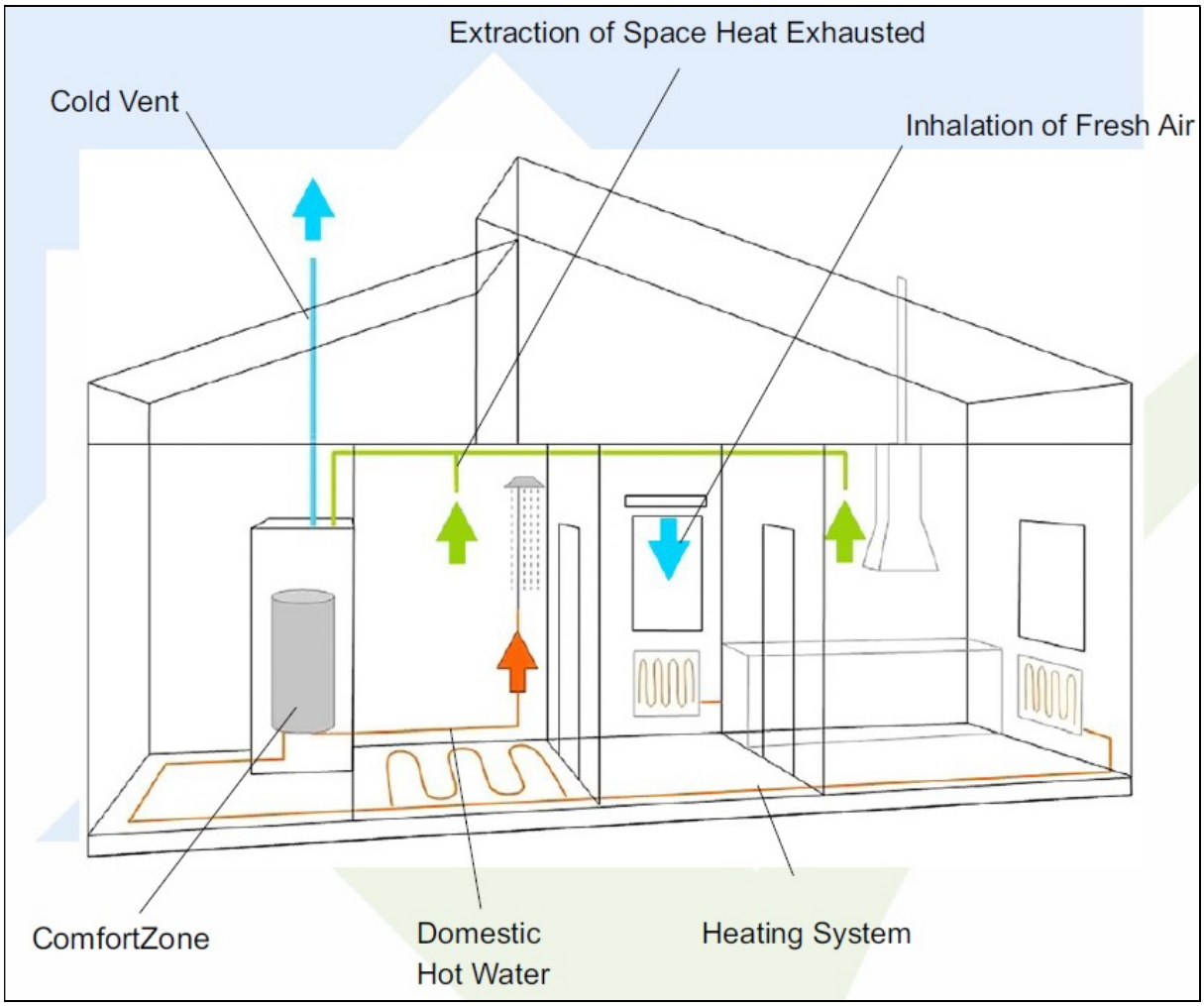

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