



MOLONEYFOX
CONSULTING ENGINEERS

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**MECHANICAL AND ELECTRICAL SERVICES REPORT
ROSSHILL, CO. GALWAY
FOR KEGATA LTD.**

DATE: 12/11/2019

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Contents

1. ESB Services
2. Eir Services
3. NZEB Requirements
4. Design Intent for Houses and Apartments.

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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 Rosshill Road and Old Dublin Road direction. This extension of the ESB infrastructure has been agreed in consultation with the developer and ESB Network Engineers.

The development shall be served using 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 currently 10/20kv cables and 3 phase cables crossing the site. These overhead cables shall be re-routed to allow the site development. The re-routing of these cables shall be agreed with ESB Networks prior to commencement on site.

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.



2.0 EIR SERVICES

The existing EIR infrastructure currently runs both along the north and east boundaries via underground ducts and overhead cables, however this system needs to be extended.

The local EIR Services infrastructure has the capacity to cater for the proposed development. From consultation with EIR Services, the existing network along Rosshill Road shall be extended to the proposed development via new underground ducts.

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.

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/m ² k
Walls	0.18 W/m ² k
Roof	0.15 W/m ² k
Doors	1.6 W/m ² k
Windows	1.2 W/m ² k
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 wither no or some 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.

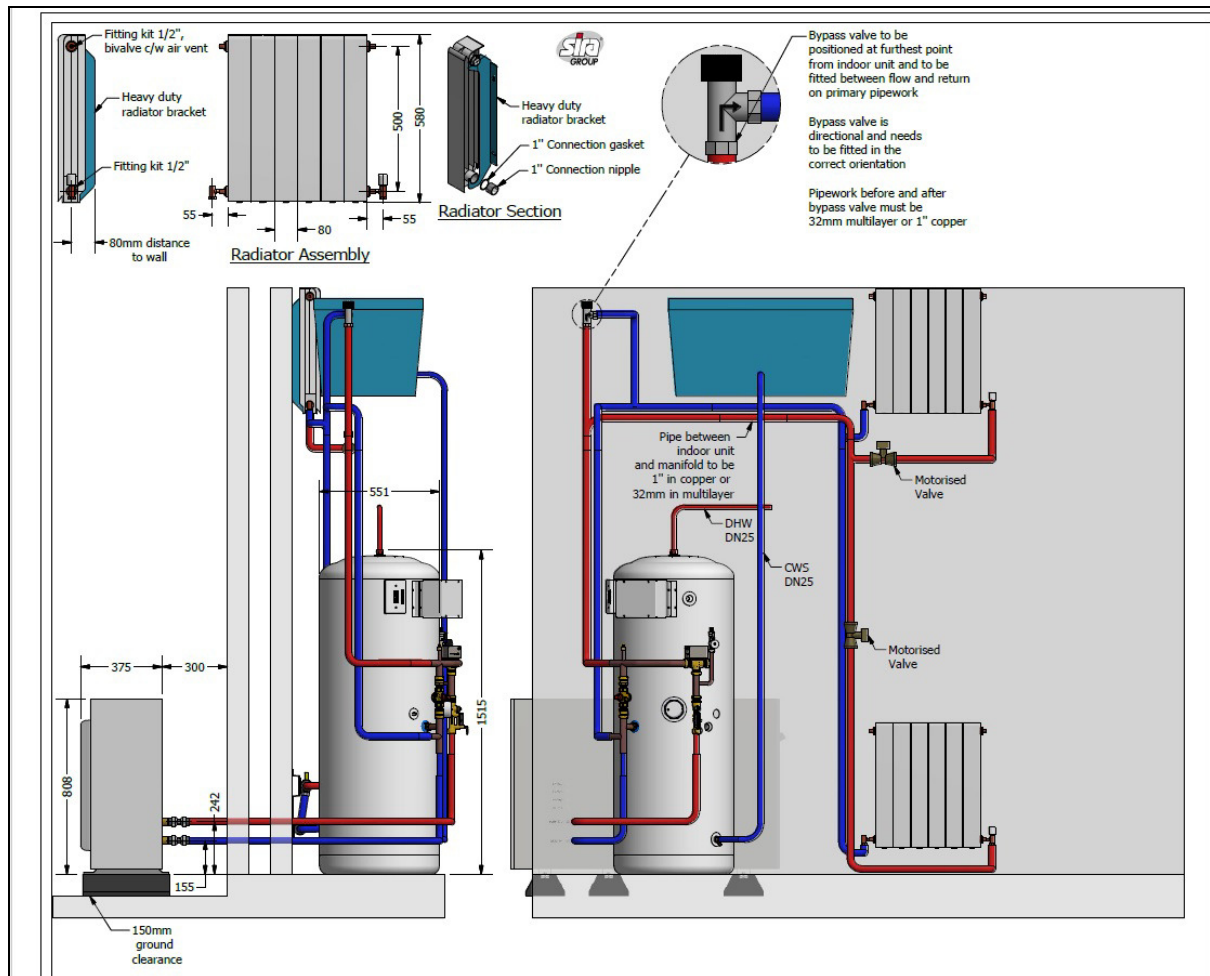


Figure 1: Proposed Heating System Schematic

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.

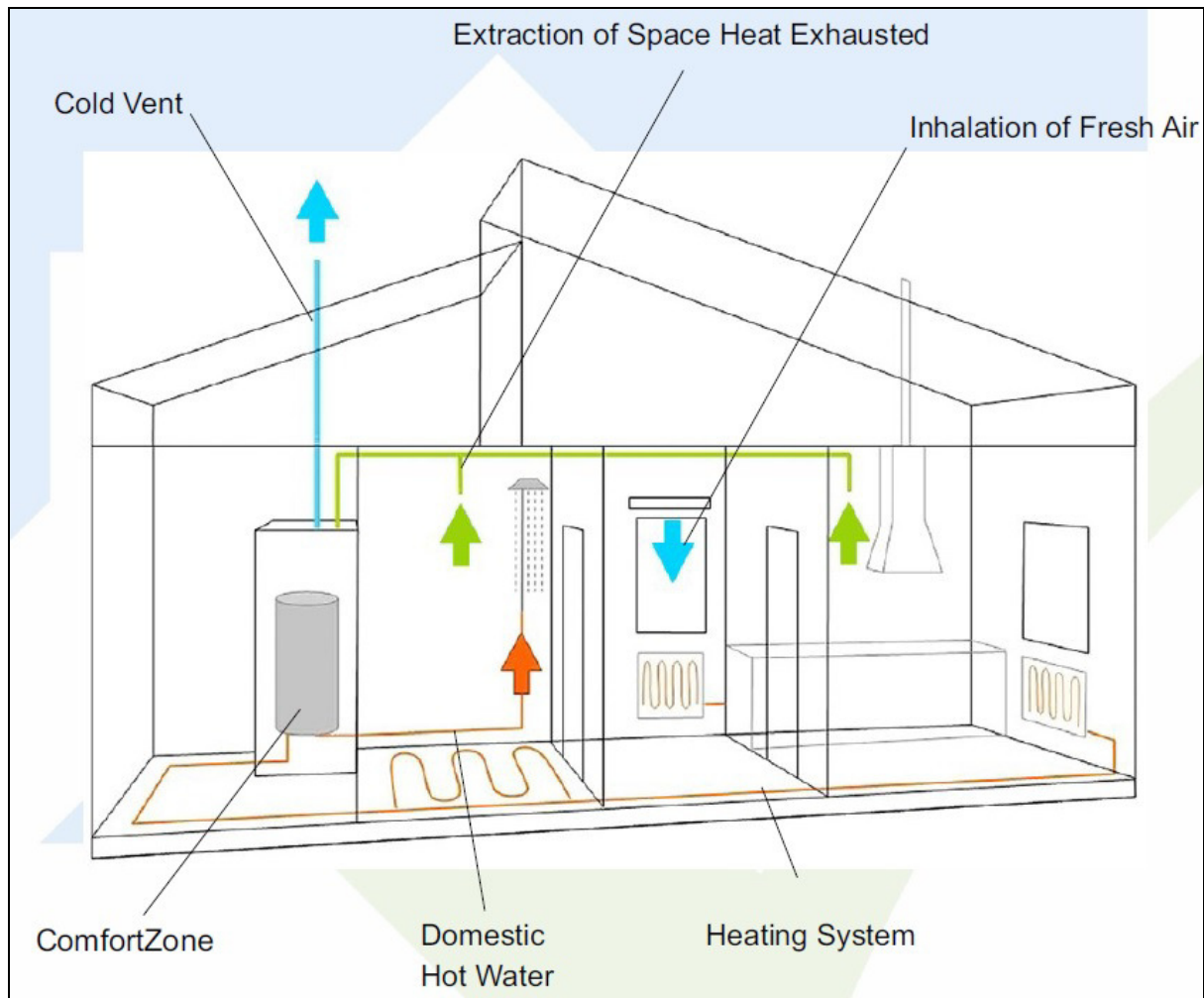


Figure 2: Proposed Heating System Schematic



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.