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**Blackglen Road (BGR) Housing Scheme
Dun Laoghaire Rathdown County Council**
Blackglen Road, Dún Laoghaire Rathdown, Co. Dublin

Mechanical and Electrical Strategy

1. CONTENTS

1. Contents	2
2. Introduction	3
3. Mechanical Services	3
3.1. Mechanical Site Services	3
3.1.1. Site Gas Services	3
3.1.2. Piped Water Services	3
3.1.3. Rainwater Harvesting System	3
3.2. Heating Services	3
3.3. Ventilation Services	4
3.4. Water Services	5
3.4.1. Mains and Cold Water	5
3.4.2. Cold Water Storage (CWS)	5
3.4.3. Domestic Hot Water (DHW)	5
3.5. Drainage	5
3.6. Plantroom Space	5
4. Electrical Services	6
4.1. Electrical Site Services	6
4.1.1. ESB	6
4.1.2. Main Distribution	6
4.1.3. External Lighting System	6
4.1.4. Telecommunications	7
4.1.5. Electrical Vehicle Supply Equipment (EVSE)	7
4.2. Block Specific Electrical Services	8
4.2.1. Lifts	8
4.2.2. Photovoltaic (PV) Systems	8
4.2.3. Emergency Lighting System	8
4.2.4. CCTV	8
4.3. Unit Specific Electrical Services	8
4.3.1. Electrical Supply	8
4.3.2. Power Distribution Services	9
4.3.3. Internal Lighting	9
4.3.4. Telephone, TV and Broadband Services	9

2. INTRODUCTION

This report presents the Mechanical and Electrical Services proposed for implementation at the Blackglen Road (BGR) Housing scheme commissioned by the Dun Laoghaire Rathdown County Council (the Client). Dun Laoghaire Rathdown County Council expressed the necessity for the Blackglen Road (BGR) Housing scheme to be on-parr with PassiveHaus principles although a PassivHaus certification would not be actively pursued. Further to this the development needs to achieve a BER rating of at least A2. The proposed Mechanical and Electrical services aims to achieve these outcomes.

3. MECHANICAL SERVICES

3.1. MECHANICAL SITE SERVICES

3.1.1. Site Gas Services

There are no gas services proposed for this development

3.1.2. Piped Water Services

In this project site water services are included in the civil and structural package and are detailed in the civil and structural engineers report. Each apartment/housing Block will be served with an incoming water main that will distribute internally to each apartment.

3.1.3. Rainwater Harvesting System

There are no rainwater harvesting system proposed for this development.

3.2. HEATING SERVICES

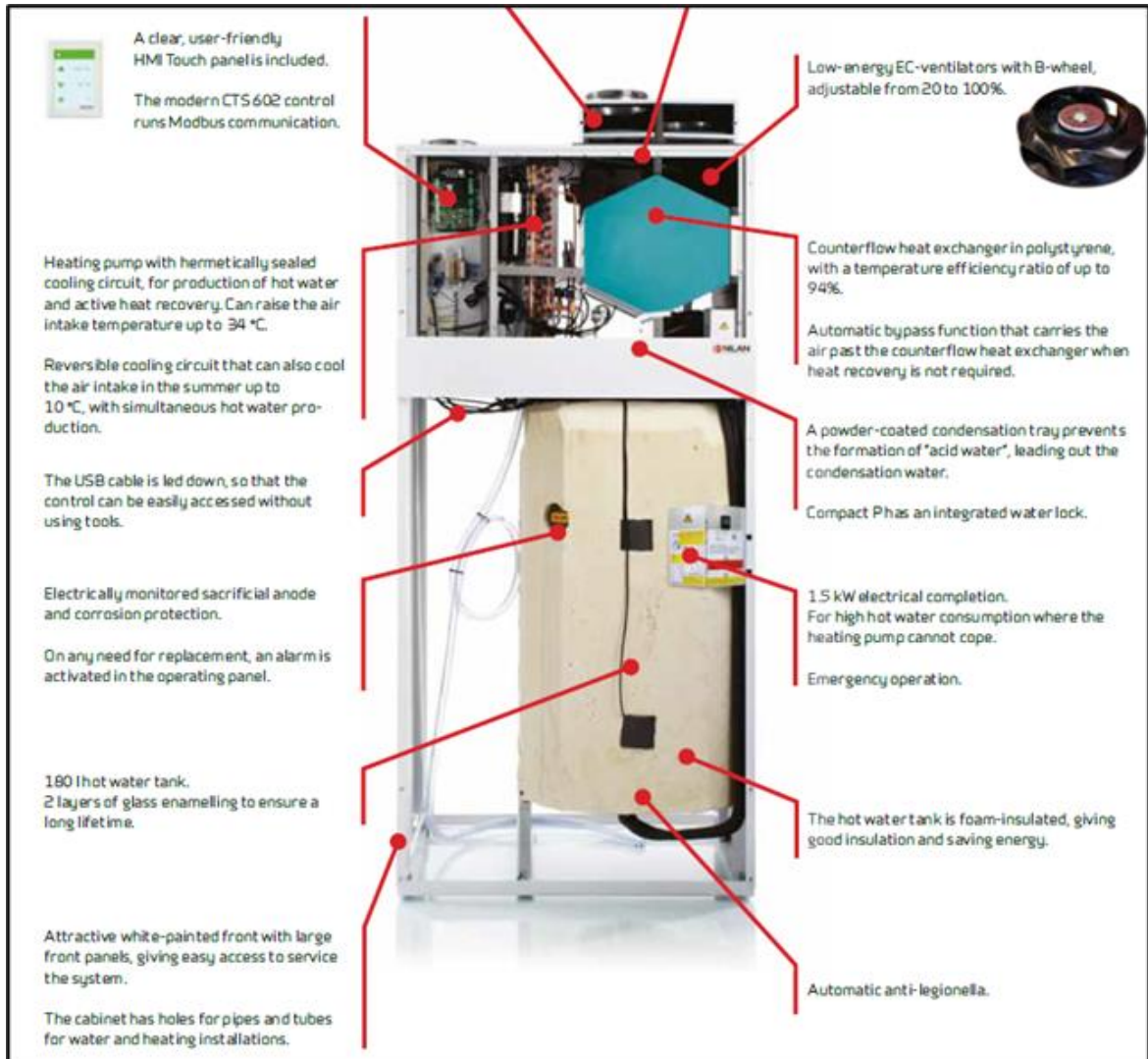
Two factors influenced the selection of the heating strategy for the BGR Housing Scheme n1:

- i. Energy efficiency is paramount and the heating strategy needs to fulfil an A2 rating as well as PassivHaus standards
- ii. The Architectural vision dictates that no outdoor units are to be implemented on this scheme.

Given the above HHP has, in consultation with the Client, included for an exhaust air heat-pump in combination with electrical radiators solution to satisfy the heating requirement of all apartments and houses in this scheme.

The current design caters for a Nilan Compact P combination unit whereby MVHR, domestic hot water heating and space heating/cooling (via supply air) can be accomplished by means of a single unit with dimensions of 900mm(W) x 610mm(D) x 2065mm(H) that can be accommodated in a cupboard.

The Compact P has a hot water cylinder capacity of 180L and an onboard ASHP capacity of 2 kW. The 2kW heat output of the ASHP will not be sufficient to provide adequate space heating during peak winter months and Nilan has advised that they always provide the Compact P unit generally backed up with 1-2 x 1kW panel heaters in strategic locations (hallways, landing or open plan kitchen/living/dining areas). The radiators are controlled from the Compact P unit to switch on and off as and when required.



ASHP – Exhaust Air to Water + MVHR + DHW Storage – Nilan Compact P

3.3. VENTILATION SERVICES

PassivHaus standards dictates the use of MVHR technology and the current design implements MVHR by means of the Nilan Compact P unit. The Compact P unit has a maximum airflow of 83l/s which makes it suitable for use in apartments/houses with up to 8 occupants.

The ducting and air terminals associated with the Nilan compact P unit are called Nilair and is comprised of the following:

- Two external wall vents – one for supply and one for exhaust air. The supply and exhaust air external wall vents need to be separated by a distance of 2m so as to ensure that no short circuiting of air occurs
- Exhaust and supply air manifolds that forms the connection between the Compact P unit and all ducts/tubes that is distributed to all rooms
- Supply air terminals in all bedrooms at ceiling level
- Exhaust air terminals in all bathrooms/toilets at ceiling level
- Thermex cooker hood in all kitchens

3.4. WATER SERVICES

3.4.1. Mains and Cold Water

An entire new Mains and Cold Water system, will be facilitated including non-metallic pipework and connections to outlets and storage tanks as required.

Mains water will be provided to each Block and metered in the main services riser on ground floor level per block. From there the mains water will distribute to each apartment and will be metered inside each apartment on the incoming line to the CWS tank

Mains water outlet/taps will be provided on the roofs where photovoltaic installations are present to cater for cleaning of these.

3.4.2. Cold Water Storage (CWS)

Each apartment/house will be fitted with a 300-litre cold water storage tank with dimensions of 600mm diameter and 1600mm height. The CWS tanks will in general be fitted in the roof voids of apartments/houses. For apartments where no roof void is available it will be accommodated inside the apartment in a dedicated storage space.

The cold supply will feed the Compact P unit DHW storage tank as well as all water closets, wash hand basins baths and showers for each apartment.

3.4.3. Domestic Hot Water (DHW)

DHW heating will be achieved via the Nilan Compact P unit. The main source of heating will be the exhaust air heat-pump (2Kw) with back-up immersion heater (1.5kw) provided. The Nilan The Compact P unit has a DHW storage capacity of 180L making it suitable for occupancies up to 5 persons.

3.5. DRAINAGE

An all-new above ground, gravity fed, soils and wastes system will be installed to EN12056-2. Toilets have been arranged over each other where possible to reduce the number of drop locations. The above ground drainage will be a gravity fed single stack system and will discharge to the final utility connection by gravity. Generally, waste and vent pipework will be hidden in service risers and ceiling voids. Intumescent fire collars will be incorporated on all soil stacks where passing between fire barriers horizontally or vertically.

3.6. PLANTROOM SPACE

For apartments in Blocks A, B & C The Nilan Compact P unit and CWS tank will be housed in a 2.5sqm dedicated Mechanical Plant area inside the apartment. The Compact P unit will be accessible from the main corridors outside the apartments.

For Blocks D, E, F & G the Compact P unit will be housed in a cupboard located in the kitchen and the CWS tank will in general be housed in the roof voids.

4. ELECTRICAL SERVICES

4.1. ELECTRICAL SITE SERVICES

4.1.1. ESB

The removal of existing overhead ESB lines has been considered and ESB have been consulted in relation to the site requirements and Infrastructural upgrades required to secure the necessary power required to run the site.

The current design allows for two ESB MV Packaged Substations of dimensions 2200mm(W) x 500mm (D) x 1400mm (H). One substation is located on the Eastern part of the site and the other on the Western part of the site. Two ESB underground cables will be feeding the substations from the existing ESB overhead MV line at the back of the site.

The final number of substations will only be determined when the ESB application is made by the Design-Built contractor but the current design is considered conservative regarding the allowance for two substations.

From the substations underground LV lines will reticulate and feed into every Block.

4.1.2. Main Distribution

From the substations underground LV lines will reticulate and feed into every Block. In each Block the LV line will terminate in the Main Distribution Board (MDB) on Ground Floor Level from where each apartments Sub Distribution Board (SDB) will be fed.

4.1.3. External Lighting System

The external lighting design has been carried out in line with the recommendations of the CIBSE/SLL Code for Lighting 2012 which recommends the following lighting levels:

Ref No.	Type of area, task or activity	$\frac{\bar{E}_m}{lx}$	U_o	GR_L	R_s	Remarks
3.13.1	Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25	55	20	
3.13.2	Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25	50	20	
3.13.3	Heavy traffic, e.g. parking areas of schools, churches, major shopping centres, major sports and multipurpose building complexes	20	0.25	50	20	

An underground ducted lighting system to serve each column where an LED mounted light fitting is covering the main avenues and parking from the entrance to the site off the main road. All Lighting columns and light fittings will be linked back to the micro pillars. The Design-Built Contractor will be tasked with all applications to be made to ESB and Council.

External lighting will be provided to the carpark, street and pedestrian walkways. Pole mounted fittings will be specified for car park, roadway and pathways. This installation will be wired in a manner capable of providing both amenity and security lighting.

The lighting control strategy has been designed to utilise the latest luminaire and control technologies to provide:

- Good lighting levels when there is a high footfall in the evenings.
- Reduced lighting levels after a predetermined time e.g. 23h00 when the activity on the development drops.

Car park and Access Road lighting:

- Lanterns will be equipped with photocells integrated into the drivers which will automatically dim the lights at a predetermined time of night.
- This technology is being adopted by most local authorities for their public lighting for new installations and upgrades.

Dimming an LED luminaire has the added advantage of significantly increasing its useful life, and thereby not only reducing energy costs but maintenance costs as well.

4.1.4. Telecommunications

Telecommunications will be fed from two existing Virgin Media chambers and one existing EIR chamber located on Blackglen Road. From there the ducts will be reticulated underground to serve all Blocks in the development.

4.1.5. Electrical Vehicle Supply Equipment (EVSE)

10% (1 in 10) of parking spaces will be served with dual outlet charger EVSE. Ducting (only) locally from the mini pillar should be provided to cover a further 1 in 5 (20%) of the parking bays, to facilitate the future installation of additional charging posts as demand requires (ducting layout to be based on double charge posts). Note all provision for EVC to be located in the same area of the carparks to minimise installation costs and maximise supervision.

And/or as per DLRCC development plans.

The design shall include;

- One number dual outlet charger located so that it can be used from a standard parking bay and from an accessible bay. An additional 1200 mm access zone is to be provided for universal parking bays.
- Each dual outlet charger post shall be of robust design and vandal resistant and be suitable for use in an unsupervised environment and feature the following;
 - i. The dual outlet charger and associated wiring, isolation and control devices shall be installed and wired in accordance with I.S. 10101: 2020.
 - ii. The dual outlet charger shall be capable of delivering 7 kW (32amp) single phase per outlet but internally configured to deliver at 3.6 kW.
 - iii. Be non-tethered and have Connector IEC 62196 Type 2 (Mennekes) with protection rating of IP65 or better.
 - iv. Must be compatible with open charge point protocol (OCPP) as well as supporting a user identification system such as radio frequency identification (RFID) IEC14443 Type A 13.56 Mhz.
 - v. Shall have GSM Modem –GPRS or better.vi.MID Power meter per outlet.
 - vi. Be part M compliant for accessibility.
 - vii. Include power overload and earth leakage protection per outlet.
 - viii. Be compatible to operate with a dynamic power load management system.
 - ix. Be compliant with the prevailing National Standards Authority of Ireland (NSAI) National Rules for Electrical Installations, the International Electrotechnical Commission standards including 62196-Vehicle Connectors, 61851-Electric Vehicle Conductive Charging, 15118-Road Vehicles V2G, 14443-RFID and also the Open Charge Alliance (OCA) open standards including the Open Charge Point Protocol

(OCPP) and the Open Smart Charging Protocol (OSCP) and the Open Charge Point Interface protocol (OCPI).

- Assessment of the electrical maximum demand of the development from the impact of EV charging needs to be considered by the appointed Design-Built Contractor. The dynamic power load management system will ensure that the charging system will not cause exceedances of the agreed Maximum Import Capacity (MIC). This load management will eliminate the need to significantly increase the MIC as additional charge points are added in the future. The charge point equipment will be specified as a 7.2 kW but internally configured to deliver at 3.6 kW. This strategy will assist in maintaining reduced running costs and can significantly reduce the requirement for additional import capacity.
- The charge point management system will not form part of the contract and will be determined by DLRCC with their own chosen operator when they commence operation.
- An electrical underground red duct (internal diameter 125mm) will be supplied and installed to ESB network specifications complete with draw wire. This will route underground from the interior of the electrical switch room to the designated EV car park area terminating in an ESB approved junction box (JB 36) with compatible galvanised lid within the soft verge adjacent to the future charging bays. This will then enable fit out of a mini pillar and associated infrastructure to supply electrical vehicle charging stations.
- The EVSE will be fed from the MDB in each associated Block. The cable feeding the charge point minipillar will be sized with consideration for future expansion.

4.2. BLOCK SPECIFIC ELECTRICAL SERVICES

4.2.1. Lifts

Blocks A, B & F will each be fitted with a single 630kg/8 person lift, compliant to Part M regulations. Blocks A & B will have 4 stops and Block F 3 stops.

Block C to meet IWA wheelchair Types A & B compliance and will be fitted with a single 1000kg/13-person lift with 900mm clear door opening and 4 stops.

4.2.2. Photovoltaic (PV) Systems

A PV system is allowed for all houses/apartments at 2 x 400W panels per apartment/house. This is in line with the A2 rating being pursued. The PV system will be housed on the roof of each Block.

4.2.3. Emergency Lighting System

A system of escape route emergency lighting (LED) will be designed for all Blocks having communal stairwells, circulation space and foyer areas (Blocks A, B, C, E, F & G) and in compliance with IS 3217 and will utilise self-contained, maintained, inverter units installed in general luminaires and exit signs.

4.2.4. CCTV

The Client has confirmed during a meeting held on 7 May that CCTV will not be required for this project.

4.3. UNIT SPECIFIC ELECTRICAL SERVICES

4.3.1. Electrical Supply

For the Blocks having apartments centralised metering will be implemented in the Lobby by means of a multimetering panel. For all houses each unit will be provided with a single-phase supply by the ESB. This supply will be provided from a recessed meter box (SDB) on a wall at the front of each house. Each

apartment/house will have an MIC of 12KVA and the installation will allow for the brief expansion area in terms of system capacity.

4.3.2. Power Distribution Services

Socket outlets shall be 13 Amp type and shall be wired in 20 Amp radial circuits and carried in galvanised steel conduit. Quantities and locations of outlets will be as required for this type of accommodation.

Fixed items of equipment will be supplied via fused, switched cable outlets and isolators, suitably rated.

4.3.3. Internal Lighting

All internal lighting will be energy efficient with provision made for low energy lamps such as Light Emitting Diodes (LEDs) which use 80% less electricity and last up to 10 times longer than ordinary light-bulbs in the dwellings.

4.3.4. Telephone, TV and Broadband Services

Each house will be provided with an Eir & VM fibre broadband connection provided by Eir/VM in underground ducts to their requirements. A telephone outlet will be provided behind the TV location for connection of the router. This network will give residents a choice of service providers for TV and broadband .

ISSUE REGISTRATION:

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P1	21/05/24	INFORMATION	PP	PP

This document takes into account the particular instructions and requirements of our Client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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