BUILDING LIFE CYCLE REPORT

SHD Stage 3 Submission

Residential Development
at Cross Guns Bridge,
Phibsborough, Dublin 7

For Bindford Ltd.

1723A-OMP-BUILDING LIFE CYCLE REPORT

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INTRODUCTION

The Sustainable Urban Housing; Design Standards for New Apartments – Guidelines for Planning Authorities were published in March 2018 (hereafter referred to as the Apartment Guidelines). The Apartment Guidelines introduced a requirement to include details on the management and maintenance of apartment schemes. This is set out in Section 6.11 to 6.14 - "*Operation & Management of Apartment Developments*", specifically Section 6.13.

Section 6.13 of the Apartment Guidelines 2018 requires that apartment applications shall:

> *"shall include a building lifecycle report, which in turn includes an assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application"*
>
> *"demonstrate what measures have been specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents."*

This Building Life Cycle Report document sets out to address the requirements of Section 6.13 of the Apartment Guidelines. The report is broken into two sections as follows:

Section 01:

An assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application.

Section 02:

Measures specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents.

PROPOSED DEVELOPMENT

The overall development will consist of 205 units build to rent apartments comprising of 55 no. studio; 85 no. 1-bed; 65 no. 2-bed apartments across 3 no. blocks ranging in height from 3 - 12 storeys on a site of 0.72Ha. Ancillary facilities include gym, multi-purpose residents' lounges, shared workspace and meeting pod, concierge facility. A café / retail unit is also provided at ground floor opening onto a public plaza.

SECTION 01

AN ASSESSMENT OF LONG-TERM RUNNING AND MAINTENANCE COSTS AS THEY WOULD APPLY ON A PER RESIDENTIAL UNIT BASIS AT THE TIME OF APPLICATION

1.1. Property Management of the Common Areas of the development

A property management company will be engaged at an early stage of the development to ensure that all property management functions are dealt with for the development and that the running and maintenance costs of the common areas of the development are kept within the agreed annual operational budget.

The property management company will enter into a contract directly with the Operating Company (OMC) for the ongoing management of the built development. This contract will be for a maximum period of 15 years and in the form prescribed by the PSRA.

The Property Management Company has a number of key responsibilities for the development that require to be set out with the Operating Company, and as copied below from the Design Standards for New Apartments:

> *6.14 The Multi-Unit Developments Act, 2011 (MUD Act) sets out the legal requirements regarding the management of apartment developments. In this regard, it is advised that when granting permission for such developments planning authorities attach appropriate planning conditions that require:*
>
> - *Compliance with the MUD Act,*
> - *Establishment of an Owners Management Company (OMC) and:*
> - *Establishment and ongoing maintenance of a sinking fund commensurate with the facilities in a development that require ongoing maintenance and renewal.*
>
> *6.15 Build-To-Rent and Shared Accommodation schemes, where there is a commercial entity owning, or operating and maintaining the development, may by their nature have different arrangements and obligations. Planning authorities should provide planning conditions for such developments which ensure the provision of appropriate management and maintenance structures including for the scenario where the BTR nature of a development is altered following specified period under SPPR 7(a) above.*

1.2. Service Charge Budget

There would typically be a service charge budget in multi-unit developments to cover items such as cleaning, landscaping, refuse management, utility bills, insurance, maintenance of mechanical/electrical lifts/ life safety systems, security, property management fee, etc, to the development common areas in accordance with the Multi Unit Developments Act 2011 (“MUD” Act);

With Build-to-Rent schemes the management of all of the above items are undertaken by the Management Company operating the facility on behalf of the commercial entity that owns the entire property.

SECTION 02

MEASURES SPECIFICALLY CONSIDERED BY THE PROPOSER TO EFFECTIVELY MANAGE AND REDUCE COSTS FOR THE BENEFIT OF RESIDENTS.

2.1. Energy and Carbon Emissions

The following are an illustration of the energy measures that are planned for the units to assist in reducing costs for the occupants.

<table>
<tr><th>Measure</th><th>Description</th><th>Benefit</th></tr>
<tr><td>BER Certificates</td><td>A Building Energy Rating (BER) certificate will be provided for each dwelling in the proposed development which will provide detail of the energy performance of the dwellings. A BER is calculated through energy use for space and hot water heating, ventilation, and lighting and occupancy. It is proposed to target an A2 rating for the apartments this will equate to the following emissions.

A2 – 25-50 kwh/m2/yr with CO2 emissions circa 10kgCO2/m2 year</td><td>Higher BER ratings reduce energy consumption and running costs.</td></tr>
<tr><td>Fabric Energy Efficiency</td><td>The U-values being investigated will be in line with the requirements set out by the current regulatory requirements of the Technical Guidance Documents Part L, titled “Conservation of Fuel and Energy Buildings other than Dwellings”.

Thermal bridging at junctions between construction elements and at other locations will be minimised in accordance Paragraphs 1.2.4.2 and 1.2.4.3 within the Technical Guidance Documents Part L. See below Table 1 of Part L, Building Regulations.

Table 1 Maximum elemental U-value (W/m²K)[1, 2]
<table><tr><th>Column 1 Fabric Elements</th><th>Column 2 Area-weighted Average Elemental U-value (Um)</th><th>Column 3 Average Elemental U-value – individual element or section of element</th></tr><tr><td>Roofs

Pitched roof
- Insulation at ceiling
- Insulation on slope

Flat roof</td><td>

0.16
0.16

0.20</td><td>

0.3

</td></tr><tr><td>Walls</td><td>0.18</td><td>0.6</td></tr><tr><td>Ground floors[3]</td><td>0.18</td><td>0.6</td></tr><tr><td>Other exposed floors</td><td>0.18</td><td>0.6</td></tr><tr><td>External doors, windows and rooflights</td><td>1.4[4,5]</td><td>3.0</td></tr></table>Notes:
1. The U-value includes the effect of unheated voids or other spaces.
2. For alternative method of showing compliance see paragraph 1.3.2.3.
3. For insulation of ground floors and exposed floors incorporating underfloor heating, see paragraph 1.3.2.2.
4. Windows, doors and rooflights should have a maximum U-value of 1.4 W/m²K.
5 The NSAI Window Energy Performance Scheme (WEPS) provides a rating for windows combining heat loss and solar transmittance. The solar transmittance value g perp measures the solar energy through the window.</td><td>Lower U-values and improved air tightness is being considered to help minimise heat losses through the building fabric, lower of energy consumption and thus minimise carbon emissions to the environment.</td></tr>
<tr><td>Energy Labelled White Goods</td><td>The white good package (where provided) in the apartments will be of a very high standard and have a high energy efficiency rating. It is expected that the below appliance ratings will be provided:
Oven - A plus
Fridge Freezer - A plus
Dishwasher - AAA
Washer/Dryer - B</td><td>The provision of high rated appliances in turn reduces the amount of electricity required for occupants.</td></tr>
<tr><td>Internal Common Areas & External Lighting</td><td>Low energy luminaires and automatic controls such as motion sensors are to be provided for electric lighting to maximize efficiency in use. LED lamps will be preferred as far as is practical. Lighting will be provided to ensure a safe environment for pedestrians, cyclists and moving vehicles, to deter anti-social behaviour and to limit the environmental impact of artificial lighting on existing flora and fauna in the area.</td><td>Low energy lamps and automatic controls improve energy efficiency. Adequate lighting levels ensure safe environments.</td></tr>
</table>

The following are **Low energy technologies** that are being considered for the development and during the design stage of the development in order to meet the requirements of Part L of the Building Regulations and to meet the upcoming Near Zero Energy Building standard if required. The specific combination from the list below will be decided on and then implemented to achieve the A2 BER Rating.

Measure	Description	Benefit
Condensing Boilers	If gas fired heating is adopted, condensing boilers will be provided as they have a higher operating efficiency, typically over 90%, than standard boilers and have the benefit of lower fuel consumption resulting from the higher operating efficiencies.	Condensing boiler have lower fuel consumption resulting from the higher operating efficiencies.
Mechanical Ventilation Heat Recovery	Centralised mechanical ventilation will be provided to all dwellings to ensure that the air quality within the dwellings will be adequate. The inclusion of Heat Recovery Ventilation into the centralised ventilation system will be considered and assessed in order to minimise the energy usage within the dwelling.	Mechanical Heat Recovery Ventilation provides ventilation with low energy usage. The MVHR reduces overall energy and ensures a continuous fresh clean air supply.
PV Solar Panels	PV Solar Panels will be considered in order to meet the renewable energy contribution required by Part L of the Building Regulations. These panels convert sunlight into electricity which can be used within the dwelling. The panels are typically placed on the South facing side of the building to maximise the solar exposure.	PV Solar Panels offer the benefit of reducing fossil fuel consumption and carbon emissions to the environment. They also reduce the overall requirement to purchase electricity from the grid.
Air Source Heat Pump	As part of the overall energy strategy for the development, the use of Air Source Heat Pumps will be assessed to determine their technical and commercial feasibility. These systems extract heat energy from the outside air and, using a refrigerant cycle, raise the temperature of the heat energy using a refrigerant vapour compression cycle.	Air source heat pumps use electrical energy from the grid to drive the refrigerant cycle but do so extremely efficiently. Modern heat pumps will typically provide 2.5 to 4 times more heat energy to the dwelling than the electrical energy they consume.
Exhaust Air Heat Pump	As part of the overall energy strategy for the apartments, the use of Exhaust Air Heat Pumps will be assessed to determine their technical and commercial feasibility. These systems extract heat energy within the dwelling from the air exhausted from wet areas and kitchen and, using a refrigerant cycle, raise the temperature of the heat energy using a refrigerant vapour compression cycle.	Exhaust Air heat pumps use electrical energy from the grid to drive the refrigerant cycle but do so extremely efficiently. The warm exhaust air, which is unwanted, is used to improve the efficiency of the heat pump which then heats both the domestic hot water and radiators within the dwelling. Similarly to Air source heat pumps, these units are very efficient with the coefficient of performance (COP) ranging from 2.5 – 4.
Combined Heat and Power	Combined Heat and Power, (CHP), is a technology being evaluated for the apartment developments within the scheme as part of a Community Heating System. This technology generates electricity and captures the waste heat from the generation unit that can be used within the heating systems in the development.	CHP can achieve energy efficiencies by reusing waste heat from the unit to meet the space heating and domestic hot water needs of the apartments. As electricity from CHP is both generated and consumed onsite in common areas.
E-car Charging Points	Within the basement parking areas, ducting shall be provided from a local landlord distribution board to parking spaces. This will enable the management company the option to install a number of E-car charging points within the basement carpark to cater for E-car demand of the residence. Ducting and on street infrastructure will also be provided throughout	Providing the option of E-car charging points will allow occupants to avail of the ever-improving efficient electric car technologies.

	the development to provide EV charging facilities in on-street parking spaces. This system operates on a single charge point access card. A full re-charge can take from one to eight hours using a standard charge point. A total of 10% of the car parking spaces will be provided with a charger.	

2.2. Materials

The practical implementation of the Design and Material principles has informed the design of internal layouts, detailing of the proposed apartment buildings, and building facades. The façade materials will consist of brick, render, glazing, zinc and pressed metal.

2.2.1. Buildings

Apartment Buildings are designed in accordance with the Building Regulations, in particular Part D 'Materials and Workmanship', which includes all elements of the construction. The Design Principles and Specification are applied to both the apartment units and the common parts of the building and specific measures taken include:

Measure Description	Benefit
Daylighting to circulation areas wherever possible	Reduces the requirement for artificial lighting
Natural/Passive ventilation system to circulation areas. The requirements for AOV shafts adjoining circulation areas have been minimised as much as possible.	Avoids costly mechanical ventilation systems and associated maintenance and future replacement.
Assisted Natural Ventilation system to basement car park with limited extent of induction fans.	Avoids provision of fully mechanically ventilating the basement.
External paved and landscaped areas	All of these require low/minimal maintenance

2.2.2. Material Specification

Measure Description	Benefit
Consideration is given to the requirements of the Building Regulations and includes reference to BS 7543:2015, 'Guide to Durability of Buildings and Building elements, Products and Components', which provides guidance on the durability, design life and predicted service life of buildings and their parts. The common parts are designed to incorporate the guidance, best practice principles and mitigations of Annexes of BS 7543: 2015 including: • Annex A Climatic Agents affecting Durability • Annex B Guidance on materials and durability • Annex C Examples of UK material or component failures • Annex D Design Life Data sheets	Ensures that the long-term durability and maintenance of Materials is an integral part of the Design and Specification of the proposed development.

Use of brickwork, rendered panels, and profiled metal cladding to envelope.	Requires minimal on-going maintenance.
Use of factory finished and alu or uPVC windows and doors, and powder coated steel balconies	Requires minimal on-going maintenance.

2.3. Landscape

Measure	Description	Benefit
Site Layout and Design	Generous and high-quality landscaping utilising semi-mature to mature tree species, shrub planting and dense groundcovers. Species are chosen for compatibility with available root and canopy space, aspect is also a guiding consideration. The objective is to enhance biodiversity whilst providing year-round visual interest and high-quality residential environments.	SUDs drainage system and landscape maintenance preferable Attenuation reduces the burden on vulnerable rainwater goods, resulting in fewer elements that could require replacement or repair.
Hard Landscaping Materials	Sustainable, robust materials, with high slip resistance to be used for paving. Durable and robust equipment (e.g. play, exercise, fencing etc.) to be used throughout.	Robust materials and elements reduce the frequency of required repair and maintenance.
Soft Landscaping	A selection including native trees and planting is proposed. Hard and soft landscaped areas are balanced to ensure a quality public environment.	High quality soft landscaping improves the general quality of the environment for residents.

2.4. Waste Management

The following measures illustrate the intentions for the management of Waste.

Measure	Description	Benefit
Operational Waste Management Plan	Please refer to "Operational Waste and Recycling Management Plan" prepared by AWN Consulting Ltd. (please see attached).	The report demonstrates how the scheme has been designed to comply with best practice.
Storage of Non-Recyclable Waste and Recyclable Household Waste	Access to a security restricted centralised bin storage area is provided at ground floor in the courtyard garden area.	Easily accessible by all residents and minimises potential littering of the scheme
	Domestic waste management strategy: • Grey, Brown and Green bin distinction. • Competitive tender for waste management collection.	Helps reduce potential waste charges.
Composting	Organic waste bins to be provided in waste storage area	Helps reduce potential waste charges.

2.5. Health & Well Being

The following are illustrations of how the health and well-being of future residents are considered.

Measure	Description	Benefit
Natural / Day	The buildings have been favourably orientated. The	Reduces reliance on artificial lighting thereby

Measure	Description	Benefit
Light	design, separation distances and layout of the apartment blocks have been designed to optimize the ingress of natural daylight/sunlight to the proposed dwellings to provide good levels of natural light.	reducing costs.
Accessibility	All units will comply with the requirements of Part M.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Security	The scheme is designed to incorporate passive surveillance with the following security strategies likely to be adopted: • CCTV monitoring details • Secure bicycle stands • Routine access fob audits	Help to reduce potential security/management costs.
Natural Amenity	A Public open space is provided in the scheme which allows direct access onto the Royal Canal towpath. Extensive communal open space areas are also provided within the scheme, including roof terraces.	Facilitates community interaction, socialising and play – resulting in improved wellbeing

2.6. Management

Consideration has been given to the ensuring the residents have a clear understanding of the property.

Measure	Description	Benefit
Home User Guide	Once a purchaser completes their sale, a homeowner box will be provided which will include: • **A Residents Pack** prepared by the Operations and Management Company (OMC) which will typically provide information on contact details for the Managing agent, emergency contact information, transport links in the area and a clear set of rules and regulations.	Residents are as informed as possible so that any issues can be addressed in a timely and efficient manner.

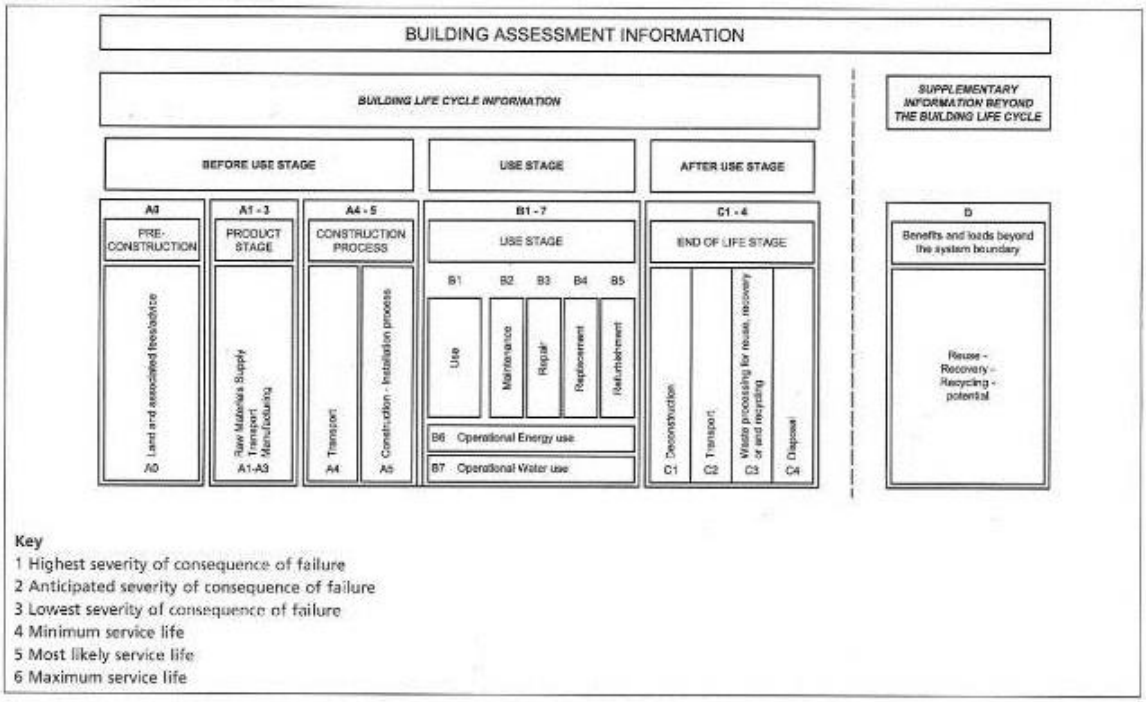
2.7. Transport

Measure	Measure Description	Benefit
Access to Public Transport (Bus, LUAS & Rail)	The site is located approximately 1.5km from the City Centre and it is located off the R135 one of the main arterial vehicular routes out if Dublin City Centre. The proposed development site is well served by existing public transport services. The Ballymun and Finglas Quality Bus Corridors (QBC) run along Phibsborough Road in both directions and a number of buses pass directly adjacent to the proposed development site: 140, 4, 83, 83a, and 9. The site is to be served by the E and F Bus Connects spine routes, providing high-frequency services (currently at consultation stage). The recently opened LUAS Cross City is also located in the vicinity of the proposed development site with the nearest LUAS stop located within walking distance (500m). The existing Drumcondra Rail station is also located within 1km of the proposed development, which provide access to the national rail network. As part of the National Development Plan (NDP) it is also proposed to upgrade this rail to DART standard. The proposed Glasnevin Metrolink stop is to be located immediately to the north of the site, further reinforcing the excellent public transport provision.	The availability, proximity and ease of access to high quality public transport services contributes to reducing the reliance on the private motor vehicle for all journey types.
Permeable Connections	Provision and subsequent maintenance of dedicated pedestrian and cycle infrastructure on-site, and their connectivity with adjoining third party lands including the Royal Canal towpath and the off-site networks, providing convenient access to local services. Primary and Greenway cycle routes run directly adjacent the site. O'Connell St is a 20-minute walk from the site.	Ensure the long-term attractiveness of walking and cycling to a range of local education, retail and community facilities and services.
Bicycle Storage	The provision of high-quality secure bicycle parking facilities at ground floor level and basement level .	Accommodates the uptake of cycling and reducing the reliance on private motor vehicles.
Motorcycle Parking	The implementation of secure, attractive, best practice motorcycle parking facilities for residents.	Reduces the reliance on private motor cars in parallel with reducing oil dependency.
E-car Facilities	Ducting will be provided from a local landlord distribution board to designated E-car charging car park spaces.	To accommodate the growing demand for E-car which assist in decarbonising society.
Car Sharing	The development includes 2no. car sharing spaces.	Reduces the reliance on private motor vehicles.

APPENDIX A:

Phases of the Life Cycle of BS7543; 2015

Figure 4 **Phases of the life cycle**



Key
1 Highest severity of consequence of failure
2 Anticipated severity of consequence of failure
3 Lowest severity of consequence of failure
4 Minimum service life
5 Most likely service life
6 Maximum service life