

# **BUILDING LIFE CYCLE REPORT**

Residential Development

at

Oldtown Mill, Celbridge, Co Kildare

On behalf of

Kildare County Council

SHB 5-OCK-RP-MCORM-AR-P3-PL901

Revision 0

**Prepared By:**

MCORM Architecture & Urban Design

**On behalf of:**

Kildare County Council

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## INTRODUCTION

The Sustainable Urban Housing; Design Standards for New Apartments – Guidelines for Planning Authorities were published in March 2018 and updated in December 2020 (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 development will consist of:

- 60 No. Residential dwellings - 40 No. houses and 20 No. apartments.

On a 1.7 Ha site at Oldtown Mill, Celbridge, Co Kildare and including all associated site and landscaping works.

This building life cycle relates to the 20 No. apartment units in accordance with the Apartment Guidelines.

## 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 Apartment Units and Common Areas

The apartment units shall be owned by Kildare County Council. The units are not planned for individual re sale. The local authority and or their agents shall be responsible for the management of the buildings and common areas.

The MUDS Act and in particular the requirement to establish an Owners Management Company (OMC) shall not apply to these units unless at some stage in the future it is decided to offer the units for individual sale. In that event an OMC would be required but at this stage that is not envisaged.

#### 1.2. Maintenance Costs / Life Cycle Costs

The owner shall be responsible for building maintenance and upkeep. The following section outlines the design measures that have been adopted to reduce long term running costs. It also includes a sample Building Investment Fund report that identifies those works which are necessary to maintain, repair, and enhance the premises over a 30-year life cycle period. This can be used to guide the preparation of maintenance and renewal budgets over the lifecycle of the buildings. A sample format of the typical BIF report is set out in Appendix A.

Note no internal common spaces are proposed. All apartments have own door access from the street.

*Note: the detail associated with each element heading i.e., specification and estimate of the costs to maintain / repair or replace, can only be determined after detailed design and the procurement/ construction of the development and therefore has not been included in this document.*

## 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.

Measure	Description	Benefit																													
<b>BER Certificates</b>	<p>A Building Energy Rating (BER) certificate will be provided for each dwelling in the proposed development which will provide details 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/A3 rating for the apartments. This will equate to the following emissions.</p> <p>A2 – 25-50 kwh/m2/yr with CO2 emissions circa 10kgCO2/m2 year  A3 – 51-75 kwh/m2/yr with CO2 emissions circa 12kgCO2/m2 /year</p> <p>Note proposed Part L revisions will increase the energy efficiency standard required for residential units.</p>	BER ratings reduce energy consumption and running costs.																													
<b>Fabric Energy Efficiency</b>	<p>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”.</p> <p>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.</p>	<p>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.</p>																													
	<table border="1"> <caption>Table 1 Maximum elemental U-value (W/m<sup>2</sup>K)<sup>1,2</sup></caption> <thead> <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> </thead> <tbody> <tr> <td colspan="3">Roofs</td> </tr> <tr> <td>Pitched roof</td> <td></td> <td></td> </tr> <tr> <td>- Insulation at ceiling</td> <td>0.16</td> <td rowspan="2">0.3</td> </tr> <tr> <td>- Insulation on slope</td> <td>0.16</td> </tr> <tr> <td>Flat roof</td> <td>0.20</td> <td></td> </tr> <tr> <td>Walls</td> <td>0.21</td> <td>0.6</td> </tr> <tr> <td>Ground floors<sup>3</sup></td> <td>0.21</td> <td>0.6</td> </tr> <tr> <td>Other exposed floors</td> <td>0.21</td> <td>0.6</td> </tr> <tr> <td>External doors, windows and rooflights</td> <td>1.6<sup>4</sup></td> <td>3.0</td> </tr> </tbody> </table> <p>Notes:  1. The U-value includes the effect of unheated voids or other spaces.  2. For alternative method of showing compliance see paragraph 1.3.2.2.  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 1.6 W/m<sup>2</sup>K when their combined area is 25% of floor area. However areas and U-values may be varied as set out in Table 2.</p>	Column 1 Fabric Elements	Column 2 Area-weighted Average Elemental U-Value (Um)	Column 3 Average Elemental U-value – Individual element or section of element	Roofs			Pitched roof			- Insulation at ceiling	0.16	0.3	- Insulation on slope	0.16	Flat roof	0.20		Walls	0.21	0.6	Ground floors <sup>3</sup>	0.21	0.6	Other exposed floors	0.21	0.6	External doors, windows and rooflights	1.6 <sup>4</sup>	3.0	
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<b>Energy Labelled White Goods</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• Oven - A plus</li> <li>• Fridge Freezer - A plus</li> <li>• Dishwasher - AAA</li> <li>• Washer/Dryer - B</li> </ul>	The provision of high rated appliances in turn reduces the amount of electricity required for occupants.																													
<b>Internal Common Areas &amp; External Lighting</b>	<p>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 behavior and to limit the environmental impact of artificial lighting on existing flora and fauna in the area.</p>	Low energy lamps and automatic controls improve energy efficiency. Adequate lighting levels ensure safe environments.																													

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 the Near Zero Energy Building standard. The specific combination from the list below will be decided on and then implemented to achieve the A2/A3 BER Rating.

Measure	Description	Benefit
<b>Condensing Boilers</b>	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.
<b>Mechanical Ventilation (+ MV with Heat Recovery)</b>	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.
<b>PV Solar Panels</b>	<p>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.</p> <p>The panels are typically placed on the South facing side of the building to maximise the solar exposure.</p>	<p>PV Solar Panels offer the benefit of reducing fossil fuel consumption and carbon emissions to the environment.</p> <p>They also reduce the overall requirement to purchase electricity from the grid.</p>
<b>Air Source Heat Pump</b>	<p>As part of the overall energy strategy for houses, the use of Air Source Heat Pumps will be assessed to determine their technical and commercial feasibility.</p> <p>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.</p>	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 4 to 5 times more heat energy to the dwelling than the electrical energy they consume.
<b>E-car Charging Points</b>	Ducting shall be provided to all parking spaces as per the development plan requirements. This will enable the future installation of E-car charging points to cater for E-car demand.	Providing the option of E-car charging points will allow occupants to avail of the ever-improving efficient electric car technologies.



## 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 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
Own Door Access	Avoids the cost of heating and lighting shared communal spaces. Each occupier responsible for their own energy use
On curtilage waste storage	No communal bin stores – allows occupiers to manage their own waste costs
Improved Daylighting	Reduces the requirement for artificial lighting
Passive ventilation in conjunction with background mechanical ventilation	Avoids the reliance on mechanical ventilation systems for purge ventilation
Plant is located within the units for ease of access. (except for any PV/solar panels which may be located on the roof)	Allows for easier maintenance and replacements as necessary

### 2.2.2. Material Specification

Measure Description	Benefit
<p>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.</p> <p>The common parts are designed to incorporate the guidance, best practice principles and mitigations of Annexes of BS 7543: 2015 including:</p> <ul style="list-style-type: none"> <li>• Annex A Climatic Agents affecting Durability</li> <li>• Annex B Guidance on materials and durability</li> <li>• Annex C Examples of UK material or component failures</li> <li>• Annex D Design Life Data sheets</li> </ul>	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 and rendered panels to envelope.	Requires minimal on-going maintenance.
Use of factory finished alu/ aluclad or uPVC windows and doors, and powder coated steel balconies	Requires minimal on-going maintenance.

### 2.3. Landscape

Measure	Description	Benefit
<b>Site Layout and Design</b>	All on-street parking spaces are provided with permeable paving. Natural Suds features incorporated into the landscaping while still maintaining 15% site area for public open space	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.
<b>Hard Landscaping Materials</b>	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.
<b>Soft Landscaping</b>	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
<b>Construction and Operational Waste Management Plan</b>	The application is accompanied by a Construction and Operational Waste Management Plan prepared by the applicant	The report demonstrates how the scheme has been designed to comply with best practice.
<b>Storage of Non-Recyclable Waste and Recyclable Household Waste</b>	On curtilage bin stores provided to each unit <ul style="list-style-type: none"> <li>- Grey, Brown, and Green bin distinction.</li> </ul>	Easily accessible by all residents and allows resident to control their own waste costs
<b>Composting</b>	Organic waste bins to be provided throughout.	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
<b>Natural / Day Light</b>	The buildings have been favorably orientated. The design, separation distances and layout of the buildings have been designed to optimize the ingress of natural daylight/sunlight to the proposed dwellings to provide good levels of natural light.	Reduces reliance on artificial lighting thereby reducing costs.

Measure	Description	Benefit
<b>Accessibility</b>	All units will comply with the requirements of Part M.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
<b>Security</b>	The scheme is designed to incorporate passive surveillance with all public spaces overlooked by residential units. Parking is located on street and proximate to the units.	Help to reduce potential security/management costs.
<b>Natural Amenity</b>	Public open space is provided in three locations within the site.	Facilitates community interaction, socialising and play – resulting in improved wellbeing

## 2.6. Management

Consideration has been given to the ensuring the homeowners have a clear understanding of their property

Measure	Description	Benefit
<b>Home User Guide</b>	Occupiers shall be provided with <ul style="list-style-type: none"> <li><b>Homeuser manual</b> – this will provide important information for the purchaser on details of their new property. It typically includes details of the property such as MPRN and GPRN, Information in relation to connect with utilities and communication providers, Contact details for all relevant suppliers and User Instructions for appliances and devices in the property.</li> </ul>	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
<b>Access to Public Transport</b>	There are bus services located on Shackleton Road (750m walk)	The availability of public transport services reduces the reliance on private motor vehicles for all journey types.
<b>Bicycle Storage</b>	Bicycle Storage is provided on curtilage for all units – 1 space per bedroom	Accommodates the uptake of cycling and reducing the reliance on the private motor vehicle.
<b>Motorcycle Parking</b>	Motor cycle parking can be accommodated on curtilage for all units	Reduces the reliance on the private motor vehicle in parallel with reducing oil dependency.
<b>E-car Facilities</b>	EV charging facilities will be provided to 20% of on street parking spaces.	To accommodate the growing demand for E-car which assist in decarbonising society and reducing oil dependency.

## APPENDIX A:

### ITEMS INCLUDED IN A TYPICAL BIF

The BIF table below illustrates what would be incorporated for the calculation of a Sinking Fund.

<b>Building Investment Fund (Sinking Fund) Calculations</b>	
<b>Building Element</b>	<b>Minimum Service life (years) at Service Commencement Date*</b>
Structure/ sub structure	60
Floor Structure	60
Roof Structure	60
Roof covering – up to 5 degree pitch	40
Roof covering – over 5 degree pitch	40
Windows	40
External wall/ cladding inc. openings	40
External doors	40
Internal partitions inc. openings	40
Internal finishes	15
Ceilings	40
Internal doors	30
Internal fixtures and fittings	15
Sanitary fittings	20
Kitchen sanitary fittings	20
Built-in furniture	20
Mechanical plant	As CIBSE Guide, Vol. B
Electrical plant	As CIBSE Guide, Vol. B
Engineering services distribution systems	As CIBSE Guide, Vol. B
CCTV installations	20
Fire installations	20
Security installations	20
Communications installations	20
Lifts	15
Underground drainage	60
External finishes -decorative coatings	25
External fences	30

# APPENDIX B:

## Phases of the Life Cycle of BS7543; 2015

Figure 4 Phases of the life cycle

