RHATIGAN ARCHITECTS

# LIFE CYCLE ANALYSIS REPORT

## LRD STAGE 3
## PLANNING APPLICATION

## LARGE SCALE RESIDENTIAL DEVELOPMENT AT NEWTOWNHOLMES ROAD, CALTRAGH, SLIGO

CLIENT: JOHN WALTER BURKE

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## INTRODUCTION

This Life Cycle Analysis Report has been prepared by Rhatigan Architects on behalf of our client; John Walter Burke in support of an LRD application for a residential development at Newtownholmes Road, Caltragh, Sligo.

The report demonstrates the measures which have been considered to effectively manage and reduce costs for the benefit of residents and the environment. We have included a template for a typical BIF to aid assessment of the long term running and maintenance costs.

Section 6 of the Sustainable Urban Housing; Design Standards for New Apartments - Guidelines for Planning Authorities 2020 includes the below sections which relate to the "Operations & Management of Apartment Developments" and require a Building Life Cycle Report to be submitted.

**Section 6.11**
*"Certainty regarding the long term management and maintenance structures that are put in place for an apartment scheme is a critical aspect of this form of residential development. It is essential that robust legal and financial arrangements are provided to ensure that an apartment development is properly managed, with effective and appropriately resourced maintenance and operational regimes."*

**Section 6.12**
*"In this regard, consideration of the long-term running costs and the eventual manner of compliance of the proposal with the Multi- Unit Developments Act, 2011 are matters which should be considered as part of any assessment of a proposed apartment development."*

**Section 6.13** of the Apartment Guidelines 2020 requires that apartment applications 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.....to 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 how we have addressed the requirements of Section 6.13 of Apartment Guidelines 2020.

## DESCRIPTION OF THE PROPOSED DEVELOPMENT

The development will consist of:

- Construction of 118 no. residential units to include; 8 no. 2 bedroom semi-detached houses, 40 no. 3 bedroom semi-detached houses, 8 no. 4 bedroom detached houses, 33 no. 4 bedroom semi-detached houses, 1 no. 5 bedroom semi-detached house, 8 no. 1 bedroom apartments, 20 no. 2 bedroom apartments
- Development of 1 no. creche facility with associated outdoor play areas and parking;
- Ancillary structures including ESB substations and associated switch rooms, bicycle and bin stores;
- Public and communal open spaces, private open space, site landscaping, public lighting, footpaths, roads, parking, foul and surface water drainage and all associated site development works;
- The application includes the provision of 2 no. access roads and construction of a footpath & cyclepath along the Newtownholmes Road at Newtownholmes Road.

# 1.0

## LIFE CYCLE ANALYSIS

## 1.1 ENERGY AND CARBON EMMISSIONS

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

| Measure | Description | Benefit |
|---|---|---|
| **BER Certificates** | The building fabric, detailing and services/renewables requirements set out in Building Regulations Technical Guidance DocumentL 2019 Conservation of Fuel and Energy – Dwellingscombine to deliver NZEB (Near Zero Energy Building) standards. The proposed buildings will be constructed to achieve these required standards and will therefore be NZEB. NZEB standard is equivalent to BER (Building Energy Rating) for eachapartment of generally A2. | Higher BER ratings reduce energyconsumption and running costs |
| **Fabric Energy Efficiency** | The subject buildings will incorporate floor, wall and roof insulation to deliver U-values superior to the Maximum Fabric Insulation U-value performances set out in Building Regulations Technical Guidance Document L 2019 Conservationof Fuel and Energy – Dwellings (or updated/revisedversion that document if relevant at time of construction).<br>Windows will be double or triple glazed to deliver insulation performance in accordance with that setout in the Technical Guidance Document. Glazing with solar resistance will be provided where required to control solar heat build-up.<br>Construction detailing around window and door opes, at floor edges etc. will incorporate the<br>provisions of the document “Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details”, published by Department ofEnvironment, Heritage and Local Government. Thisdetailing limits heat loss and also limits the air permeability of the envelope of the buildings.<br><br>Building Services and Renewable Technologies The use of in-apartment Heat Pumps, designed tocapture heat from external air, is included for<br>consideration in the design of the subject buildings.Other energy efficient technologies will also be considered.<br>Lighting points will be suitable for the use of lowenergy lighting. | Lower U-values and improved air tightness is being considered to help minimise heat losses throughthe building fabric, lower energy consumption and thus minimise carbon emissions to the environment. |

| | | |
|---|---|---|
| **Energy Labelled White Goods** | The white goods package planned for provision in the apartments will be of a very high standard and have a high energy efficiency rating. It is expected that the following appliance standards will be provided-<br>Oven- A+<br>Fridge Freezer- A+<br>Dishwasher- AAA<br>Washer/ Dryer- B | The provision of high rated appliances in turn reduces the amount of electricity required for occupants. |
| **Internal Common Areas & External External lighting** | 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. | 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 the specific combination from the list below will be decided upon and then implemented to achieve an A2/ A3 BER rating-

| Measure | Description | Benefit |
|---|---|---|
| **Air Source Heat Pump** | As part of the overall energy strategy, the use of Air Source Heat Pumps will be assessed to determine their technical and commercial feasibility.<br><br>These systems extract heat energy from the outside air and 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 4 to 5 times more heat energy to the dwelling than the electrical energy they consume. |
| **Combined Heat and Power** | Combined Heat and Power, (CHP), is a technology being evaluated 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.<br><br>All electricity from CHP is both generated and consumed onsite (in common areas). |
| **Condensing boilers** | Condensing boilers are being investigated 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** | Mechanical ventilation will be provided to all apartments to ensure that the air quality within the units will be adequate. The inclusion of Heat Recovery Ventilation 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 provides a continuous fresh clean air supply. |
| **E-car Charging Points** | Provision will be made for charging points for parking spaces.<br>This will enable the management company to offer the option to install a number of E-car charging points to cater for future E-car demand. | Providing the option of E-car charging points will allow occupants to avail of the ever-improving electric car technologies. |
| **Solar Control Glazing** | Will be considered in association with DEAP calculations findings relating to overheating risk | Can contribute to reduction in un-wanted summer heat build-up and can improve comfort levels |

## 1.2 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.

### 1.2.1 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 stair core areas | Reduces the requirement for artificial lighting |
| Natural/Passive ventilation system to circulation areas. Passive smoke shafts are proposed throughout minimizing mechanical maintenance of extract fans | Avoids costly mechanical ventilation systems and associated maintenance and future replacement. |
| It is proposed to naturally ventilate the carpark in order to minimize / eliminate the need for mechanical ventilation. | Avoids costly mechanical ventilation systems and associated maintenance and future replacement |
| External paved and landscaped areas | All of these require low/minimal maintenance |
| The plant is located at ground floor level for ease for access. (except for any PV/solar panels which may be located on the roof) | Allows for easier maintenance and replacements as necessary |

### 1.2.2 MATERIALS 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<br>All common areas if the scheme, and their durability and performance are designed and specified in accordance with Figure 4: Phases of Life Cycle BS 7543:2015. The common parts are designed to incorporate the guidance, best practice, principles and mitigations of Annexes of BS 7543:2015 including-<br>• Annex A Climatic Agents affecting Durability<br>• Annex B Guidance on materials and durability<br>• Annex C Examples of UK material or component failures<br>• 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 clay brickwork generally and sand cement render. | Require minimal on-going maintenance. |
| External windows and doors. Generally coloured upvc. The embodied energy of upvc frames is substantially less than aluminum. The embodied energy of upvc frames is greater than timber. Maintenance requirements attaching to timber frames are however considered too onerous, having regard to the scale, height, and part street-fronting location of the proposed development. These maintenance requirements would considerably outweigh supply stage embodied energy advantages of timber. | UPVC windows have embodied energy advantages (combined supply and lifetime) and require only minimal on-going maintenance. |

## 1.3 HEALTH AND WELL BEING

| Measure | Description | Benefit |
|---|---|---|
| **Natural/ day light** | The buildings have been favorably orientated. The design, separation distances and layout of the apartment blocks have been devised to optimize the ingress of natural daylight/sunlightto the proposed dwellings to provide good levels of natural light. | Reduces reliance on artificial lighting thereby reducing costs.Provides attractive indoor environments for residents. |
| **Accessibility** | All units will comply with the requirements of Building Regulations, Technical Guidance Documents Parts K and M fostering easy access and circulation through the proposed scheme. | 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 strategieslikely to be adopted- CCTV monitoring details Secure bicycle stands, Overlooked communal open space. | Help to reduce potential security/management costs. |
| **Natural Amenity** | Public and communal open spaces are provided within the residential environment, retaining and integrating new and existing trees and h edgerows. Connections to local amenity, Sligo town centre, are facilitated. | Facilitates community interaction,socialising and play – resulting in improved wellbeing. Improves vistas from the proposed apartments |

## 1.4 MANAGEMENT

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

| Measure | Description | Benefit |
|---|---|---|
| **Home User Guide** | Once a purchaser completes their sale, a homeowner box will be provided which will include:<br>• **Homeowner Manual** - This will provide important information for the purchaser on details of the property. Typically, it includes details of the property such as MPRN and GPRNinformation in relation to connection with utilities and communication providers. Contact details for all relevant suppliers and user instructions for appliances and devices in the property.<br>• **Residents' Pack -** prepared by the 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. |

## 1.5 WASTE MANAGEMENT

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

| Measure | Description | Benefit |
|---|---|---|
| **Construction and Operational Waste Management Plan** | The application is accompanied by a Construction and Operational Waste Management Plan. | The report demonstrates how the scheme has been designed to comply with best practice. |
| **Storage of Non-Recyclable Waste and Recyclable Household Waste** | The waste management strategy is generally as follows:<br>Bin stores to serve the residential units are located in 3 no. bin/bike stores at ground floor level. These bin stores are distributed evenly, proximate to the entrances to the 7 blocks. The filled bins will be brought out to the layby/bin collection area outside each of the stores for collection on designated days. Not all bins will be collected on a single day. The Waste Management Plan proposes collection staggered across a number of days to limit the bins volume on any particular day. | Easily accessible by all residents and minimises potential littering of the scheme.<br>Bin store locations minimize associated nuisance or threat to amenity of residents. |
| | Domestic waste management strategy:<br>• Grey, Brown, and Green bin distinction.<br>• Competitive tender for waste management collection. | Helps reduce potential waste charges. |
| **Composting** | Organic waste bins to be provided throughout. | Helps reduce potential waste charges. |

## 1.6 LANDSCAPE

| Measure | Description | Benefit |
|---|---|---|
| **Site Layout and Design** | Generous and high-quality landscaping, with ecological corridors prioritising pedestrians and landscape over a car-dominating layout. This measure is reinforced by retention of the existing character of the site, in which the development is carefully integrated. | SuDS mimics natural drainage through:<br>• Storing runoff and releasing it slowly (attenuation) Harvesting and using the rain close to where it falls Allowing water to soak into the ground (infiltration)<br>• Slowly transporting (conveying) water on the surface<br>• Filtering out pollutants<br>• Allowing sediments to settle out by controlling the flow of the water |
| **Hard Landscaping Materials** | Sustainable, robust materials, with high slip resistance to be used for paving. Durable and robust equipment (e.g., play, 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. |

## 1.7 TRANSPORT

| Measure | Description | Benefit |
|---|---|---|
| **Access to Public Transport (Bus & Train Services)** | The site is 500m from Crozon Park Road where the local S1 bus route from Cairns Road South of the site, north to Classibawn Drive via O'Connell Street, Sligo Hospital, ATU (via Ashlane).<br>Sligo Train Station (MacDiarmada) which terminates the Dublin line is 2.1kmand adjacent to the Bus station which serves the #23 route to Dublin and #64 Galway - Derry service.<br>Cycle lanes are proposed along the Newtownholmes road adjoining the site which connects to a route along the N4 to Temple Street (Sligo Cathedral) | The availability, proximity and ease of access to high quality public transport services contributes to reducing the reliance on private motor vehicles for all journey types. |
| **Permeable Connections** | The development is fully interconnected by pedestrian and cycling routes both within the scheme and to adjoining Newtownholmes Road were Sligo County Council plan to upgrade the footpaths and cycle lanes to enhance pedestrian and cycling linkages to Sligo City Centre. A connection has also been created between the park to the north and the proposed park in the development to the north (Pl Ref: 23/60056) creating a larger open space and allowing pedestrian access onward towards Sligo City Centre | Ensures the long-term attractiveness of walking and cycling to a range of local education, retail and communityfacilities and services. |
| **Bicycle Storage and parking** | Secure and sheltered high quality bicycle parking for residents along with public realm Sheffield stands for creche users and visitors equally distributed across the development. | Accommodates the uptake of cycling and reducing the relianceon the private motor vehicle. |
| **E-CAR facilities** | Underground ducting provided from a local landlord distribution board to all on-street parking designated for apartments and visitors.<br>Underground ducting and 1 in 5 spaces with EV charging points provided at the creche.<br>On-curtilage parking at houses can connect to corresponding private network for EV charging. | To accommodate the growing demand for e-cars which assist in decarbonising society and reducing oil dependency. |

## APPENDIX A: ITEMS INCLUDED IN A TYPICAL BIF

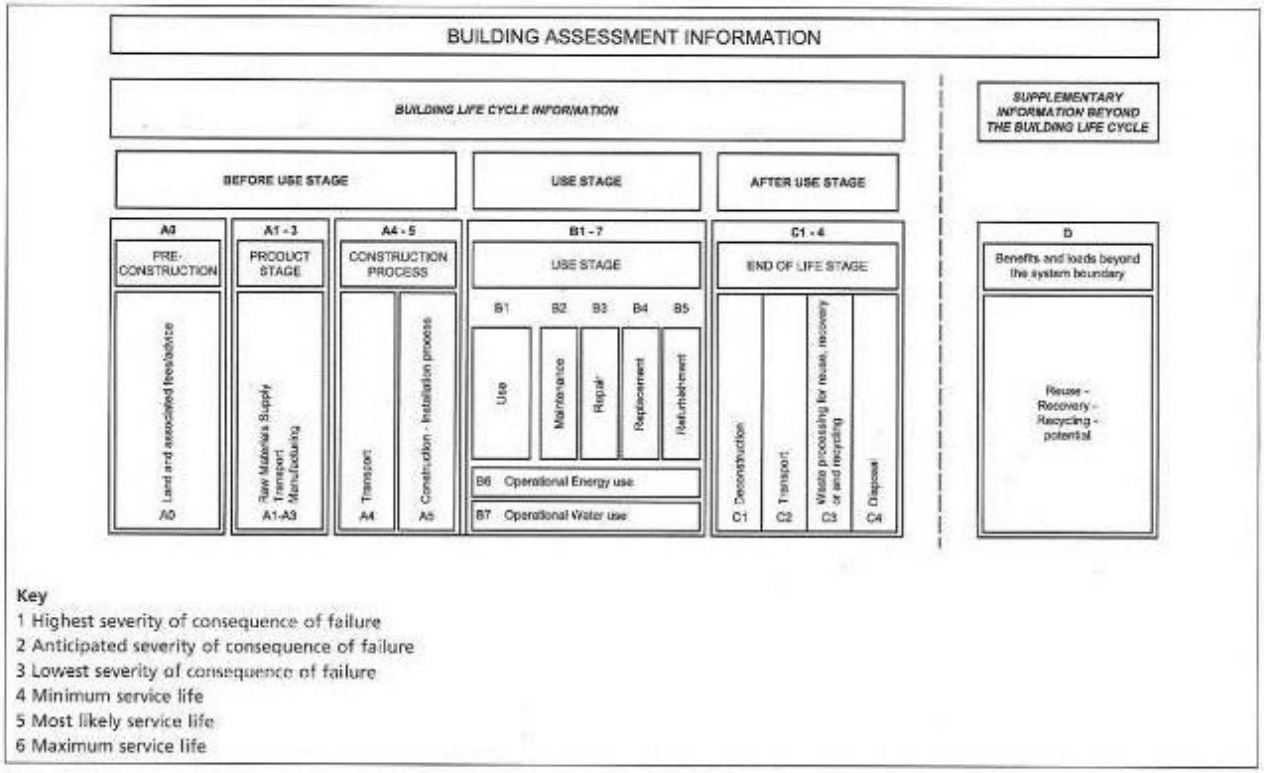
| | BUILDING INVESTMENT FUND (SINKING FUND) CALCULATIONS | | |
|---|---|---|---|
| **Ref** | **Element** | **Life Expectancy** | **Amount** |
| **1.00** | **Roofs** | | |
| 1.01 | Replacement tiles/felt roof covering incl. insulation to mainroofs. | 30 | |
| 1.02 | Replacement/ repairs to facias | 18 | |
| 1.03 | Replace roof access hatches / roof lights | 25 | |
| 1.04 | Overhaul waterproofing details to terraces / balconies | 12 | |
| **2.00** | **Elevations** | | |
| 2.01 | Minor repairs and preparation for decorations of rendered areas | 18 | |
| 2.02 | Replace exit / entrance doors | 25 | |
| 2.03 | Replace Rainwater goods | 25 | |
| 2.04 | Recoat powder coated finishes to balconies | 20 | |
| 2.05 | Periodic replacement and overhauling of external fixings | 5 | |
| 2.06 | Replace Balcony floor finishes | 25 | |
| **3.00** | **Staircores & lobbies** | | |
| 3.01 | Decorate Ceilings | 7 | |
| 3.02 | Decorate Walls | 7 | |
| 3.03 | Decorate Joinery | 7 | |
| 3.04 | Replace fire doors | 25 | |
| 3.05 | Replace floor coverings (stairwells & lobbies) | 12 | |
| 3.06 | Replace entrance mats | 10 | |
| 3.07 | Replace nosings | 12 | |
| 3.08 | Fixed Furniture & Equipment - Provisional Sum | 18 | |

| | | | |
|---|---|---|---|
| **4.00** | **Bin/Bike Stores & Car Parking** | | |
| 4.01 | Repaint parking spaces & Numbering | 7 | |
| 4.02 | Replace store doors, ironmongery & digi-locks | 15 | |
| 4.03 | Replace Bike stands | 25 | |
| **5.00** | **M&E Services** | | |
| 5.01 | General - Internal relamping | 7 | |
| 5.02 | Replace Internal light fittings | 18 | |
| 5.03 | Replace External light fittings (lights at entrance lobbies) | 18 | |
| 5.04 | Replace smoke detector heads | 18 | |
| 5.05 | Replace manual break glass units/ disabled refuge callpoints | 18 | |
| 5.06 | Replace Fire alarm panel | 18 | |
| 5.07 | Replace AOV's | 25 | |
| 5.08 | Replace security access control installation | 15 | |
| 5.09 | External Mains Water connection | 20 | |
| 5.10 | Electrical Mains and Sub Mains distribution | 20 | |
| 5.11 | Emergency Lighting | 20 | |
| 5.12 | Overhaul and/or replace Waste Pipes, Stacks & Vents | 20 | |
| **6.00** | **Exterior** | | |
| 6.01 | External boundary treatments - Recoat powder coated finishes to railings | 60 | |
| 6.02 | Replace external signage | 18 | |
| 6.03 | Replace block paved areas | 18 | |
| 6.04 | 15-year overhaul of soft landscaping generally | 15 | |
| 6.05 | Replace CCTV provision | 12 | |
| 6.06 | External Handrails and balustrade | 18 | |

## APPENDIX B: PHASES OF THE LIFE CYCLE

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