NRG CONSULTING

Building Life Cycle Report

Magee Barracks, Kildare

June 2019

Contents

Document Control Sheet

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Rev.	**-**
Issue Purpose	**For Planning**
Client	**Ballymount Properties Ltd.**
Site Address	**Magee Barracks, Kildare**
Assessor	**Ryan Thrower**
Approved By	**Ryan Thrower**
Date of Issue	**25.06.2019**

1. EXECUTIVE SUMMARY

1.1 NRG Consulting have been appointed to carry out a Building Life Cycle Report on a proposed development at the Former Magee Barracks Site, Hospital Street (R445), Kildare Town, Co. Kildare

1.2 The description of the proposed development is:

The development will consist of the demolition of 17 no. existing buildings (including a range of former Barracks buildings, the Officers' Mess building and Water Tower structure) with a GFA of 16,320 sq.m, and the construction of a development comprising of 375 no. residential units, a neighbourhood centre comprising of 3 no. single-storey retail units with a GFA of 130 sq.m, 105 sq.m and 100 sq.m respectively, a café (including gallery / exhibition area at mezzanine level) with a GFA of 300 sq.m, a two-storey childcare facility with a GFA of 680 sq.m and associated play area, all internal roads, car parking, pedestrian and cycle paths, public open space, and all associated site and infrastructural works on an application site of c. 11.35 ha.

1.3 The Accommodation Schedule for the scheme comprises of a mix of apartments and houses in the following configuration:

Type	Number
3 bed semi-detached units;	*76*
3 bed terrace units;	*42*
4 bed semi-detached units;	*60*
4 bed detached units;	*7*
1 bed apartment units within the duplex blocks;	*16*
2 bed apartment units within the duplex blocks;	*34*
3 bed apartment units within the duplex blocks;	*18*
1 bed apartment units within the apartment blocks; and	*30*
2 bed apartment units within the apartment blocks.	*92*

1.4 In terms of mass and context, the houses are 2 to 3 storeys in height, the duplex blocks are 2 to 3 storeys in height and apartment blocks are 4 to 5 storeys in height over basement car park.

1.5 The associated site and infrastructural works include foul and surface / storm water drainage, attenuation tanks and the following provisions:

1.5.1 **Car Parking**

639 total number of car parking spaces comprising;

560 spaces for the residential units,
51 visitor spaces
28 spaces to serve the proposed creche, retail units,

Cycle Parking

485 total number of car parking spaces comprising;

447 spaces for the residential units,
15 spaces for the Neighbourhood Centre
20 spaces to serve the proposed Creche

Open Spaces and Associated Infrastructure

- Public open space measuring c. 1.8 hectares,
- bin and bike stores,
- 3 no. electricity substations,
- Landscaping
- New Cycle lanes
- A new signalised road junction is proposed onto Hospital Street providing access to the proposed development and also to the adjacent lands where a supermarket and cancer treatment clinic are proposed. Road works are also proposed to Hospital Street (R445), including pedestrian crossings, upgrades to footpaths, signage, road markings and traffic signalling.

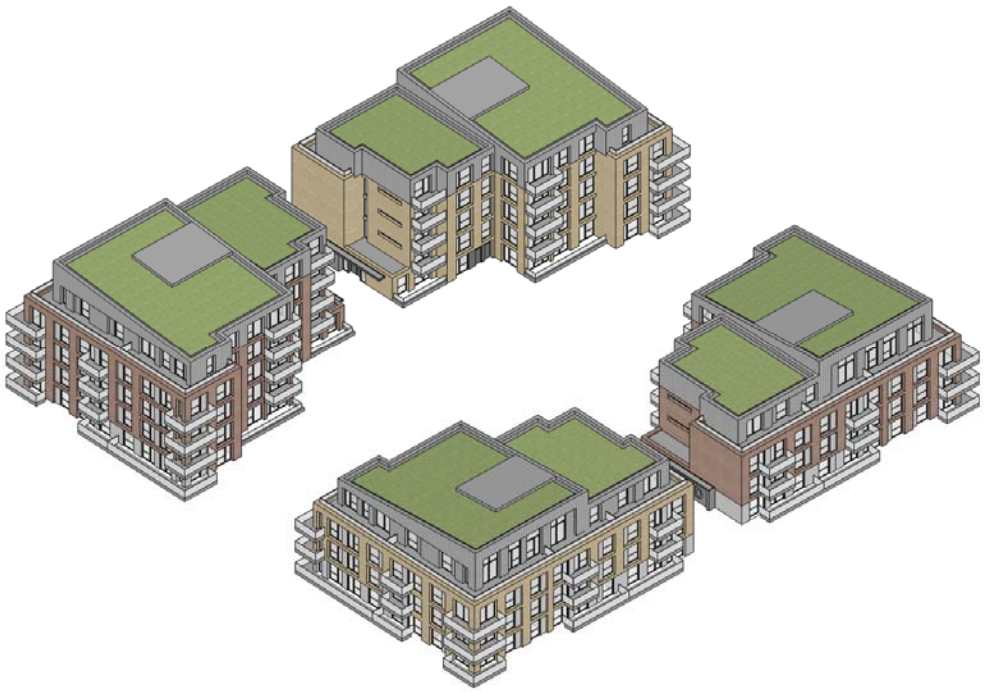


Figure 1: *3d Model of Proposed Buildings.*

Overall, the report demonstrates that the development has the opportunity to deliver a low cost solution for homeowners through a number of energy efficient, low emission sustainable solutions. Demonstrating compliance with Multi-Unit Developments Act of 2011, via legal and financial arrangements, effective and appropriately resourced maintenance and operational regimes and shows consideration to the long-term running costs of the scheme. The report also illustrates the specific measures which have been considered to effectively manage and reduce costs for the benefit of future residents.

2. POLICY FRAMEWORK

2.1 Legislation

The Sustainable Urban Housing Design Standards for New Apartments – Guidelines for Planning Authorities (published in March 2018), introduced a requirement to include details on the management and maintenance of any apartments that may be contained within housing developments.

The Guidelines state that consideration of the long-term running costs and manner of compliance of the proposal with the Multi- Unit Developments Act, 2011 are matters which should now be considered as part of any assessment of a proposed apartment development.
Section 6.13 of the guidelines 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';*

- *'....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, and includes an assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of this application, as well as demonstrating what measures have been specifically considered by the applicant to effectively manage and reduce costs for the benefit of residents. It is broken into two sections as follows:

Section 1: 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 2: Measures specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents.

Figure 2: *Aerial view of the site as existing.*

3. SECTION 1

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

3.1 Long-Term Running Costs

The aim of the developer is to manage and minimise potential unnecessarily high running costs on a per residential unit basis. Ballymount Properties Ltd. have a proven track record in the delivery of high-quality homes and apartments and have applied their experience to ensure the provision of a product which will be well managed and easily maintained.

3.2 Property Management of the Common Areas of the development

A property management company will be employed at an early stage to ensure that all property management functions are dealt with and that the running and maintenance costs of the common areas are kept within the agreed Annual operational budget. The property management company will enter into a contract directly with the Owners Management Company (OMC) for the ongoing management of the built development. This contract will be for a maximum period of 3 years and in the form prescribed by the PSRA.

The Property Management Company also has the following responsibilities for the apartment development once constructed:

- Timely formation of an Owners Management Company (OMC) – which will be a company limited by guarantee having no share capital. All future purchasers will be obliged to become members of this OMC.
- Preparation of annual service charge budget for the development common areas.
- Fair and equitable apportionment of the Annual operational charges in line with the Multi Units Development Act 2011 (MUD Act);
- Engagement of independent legal representation on behalf of the OMC in keeping with the MUD Act - including completion of Developer OMC Agreement and transfer of common areas;
- Transfer of documentation in line with Schedule 3 of the MUD Act;
- Estate Management;
- Third Party Contractors Procurement and management;
- OMC Reporting;
- Accounting Services;
- Corporate Services;
- Insurance Management;
- Staff Administration;
- After Hours Services.

3.3 Service Charge Budget

The property management company has a number of key responsibilities, primarily the compiling of the service charge budget for the development for agreement with the OMC. The service charge budget covers 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.

This service charge budget also includes an allowance for a Sinking Fund and this allowance is determined following the review of the Building Investment Fund (BIF) report prepared for the OMC. The BIF report once adopted by the OMC, determines an adequate estimated annual cost provision requirement based on the needs of the development over a 30-year cycle period. The BIF report will identify those works which are necessary to maintain, repair, and enhance the premises over the 30-year life cycle period, as required by the Multi Unit Development Act 2011.

In line with the requirements of the MUD Act, the members of the OMC will determine and agree each year at a General Meeting of the members, the contribution to be made to the Sinking Fund, having regard to the BIF report produced.

A sample format of the typical BIF report is set out in Appendix 1.

3.4 Sinking Fund

It is expected that a sinking fund allowance will account for future major maintenance and upgrade costs. A 10-year Planned Preventative Maintenance (PPM) strategy will determine the level of sinking fund required.

4. SECTION 2

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

4.1 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 scheme this will equate to the following emissions:

<table><tr><th>Energy Usage</th><th>CO_2 Emissions</th></tr><tr><td>50 kwh/m2/yr</td><td>20kgCO2/m2/year</td></tr></table></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”.

A sample proposed specification for the Plots is:
<u>Elements</u> <u>U Value</u>

Ground Floor 0.20 W/m2K

External Wall 0.2 W/m2K

Sloping Roof 0.16 W/m2K

Pitched Roof 0.16 W/m2K

Dormer Roof 0.16 W/m2K

Windows 1.4 W/m2K

Ventilation Natural

Air Permeability $7m^3/hm^2@50Pa$

In regards to Thermal Bridging, principles will be implemented to reduce heat losses through the junctions including the following of the guidance as laid out in the Accredited Construction Details document.</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 minimize carbon
emissions to the environment.</td></tr>
</table>

Energy Labelled White Goods	The white good package planned for provision to the scheme have a high energy efficiency rating in-line with the EU Energy Labelling scheme. It is expected that the below appliance ratings will be provided: • Oven – A+ • Fridge Freezer – A++ • Dishwasher – A+ • Washer/Dryer - B	Providing appliances that achieve a high energy efficiency labelling will reduce fuel bills for the future tenants.
External Lighting	The proposed lighting scheme within the development consists of 6m pole mounted fittings as indicated on the drawing below. The luminaire selected are by Philips (Micro BGP615) and were selected for the following reasons; • LED low energy fittings • LED lighting on medium height poles minimizes light spill • Fittings ensure 1 lux maximum is achieved at the site boundary LED lighting types are directional and minimize spill outside of roadway and main pedestrian paths	The site lighting has been designed to provide 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.

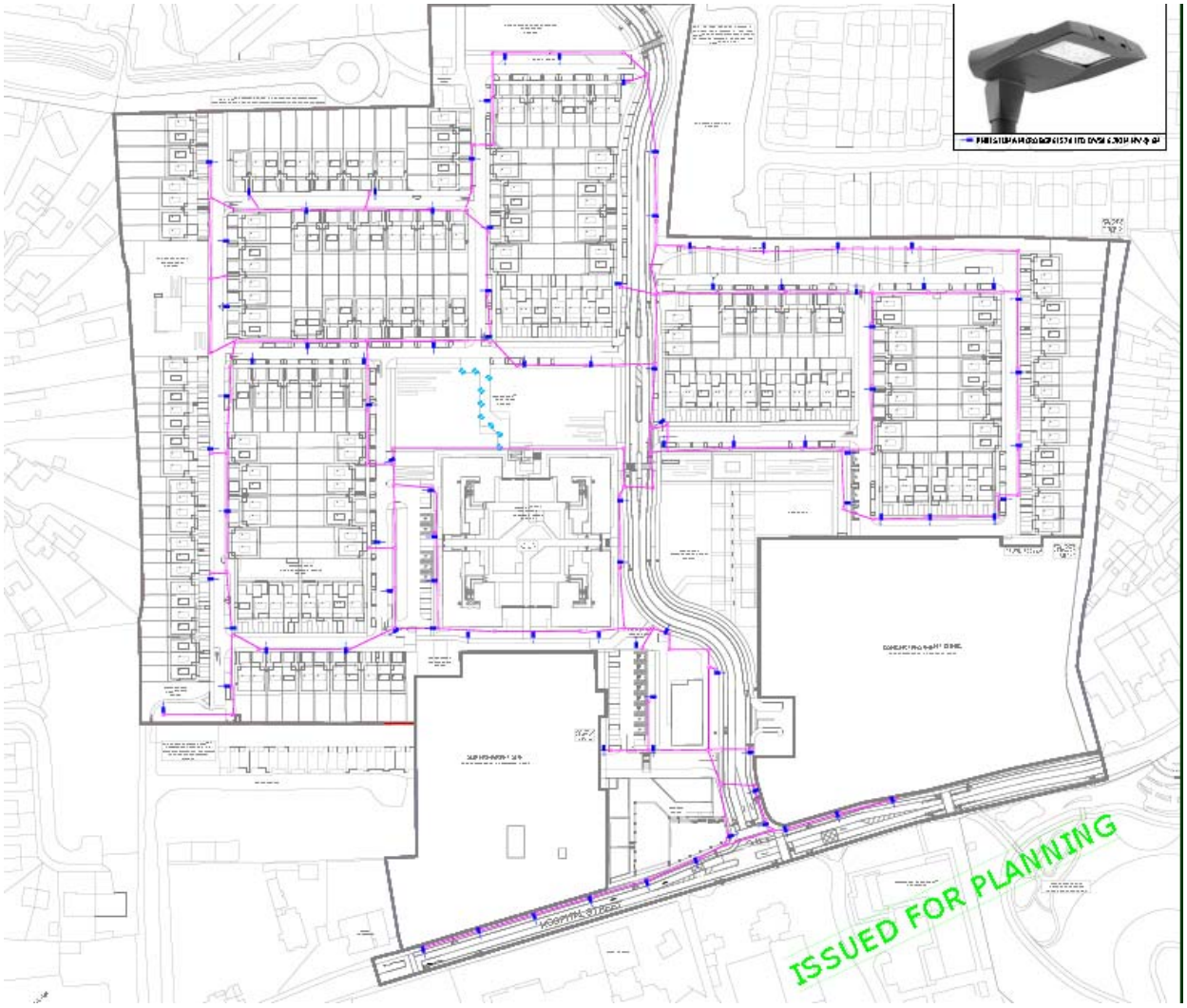


Figure 3: *Proposed External Lighting Drawing*

4.2 Daylight

Measure	Description	Benefit
Daylighting to units	Where possible, as outlined in '*Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities* (March 2018)' *to have regard for quantative performance approaches to daylight provisions 'outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision* The analysis of the internal space of the proposed development indicate that for all the rooms the Average Daylight Factor comfortably exceeds the acceptable criteria of both the BRE Guide and as also set within BS 8206-2 in terms of ADF. .	Reduces the requirement for continuous daylighting, thus reducing the expense of artificial lighting

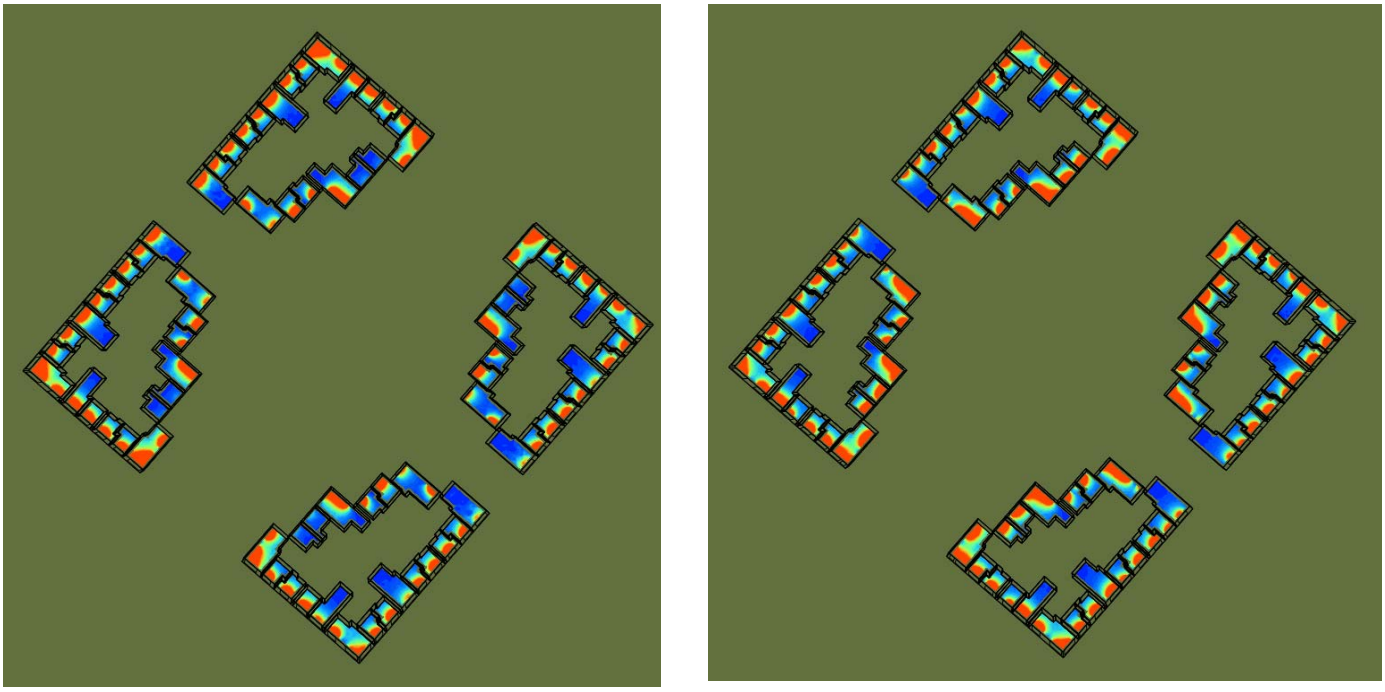


Figure 4: *ADF results for the proposed development, original and improved design – Second Floor*

4.3 Low Energy Technologies

In accordance with legislation and Building Regulations, the following low carbon and renewable technologies have been considered for the development along with other low energy technology.

Measure	Description	Benefit
Exhaust Air Heat Pump	An exhaust air heat pump system is under consideration for heating, hot water and ventilation of the apartment units. An example of such is the NIBE range: 	Exhaust Air Heat pumps operate with efficiencies >400% when it comes to heating. Exhaust air heat pumps utilise extract air as the air source for the heat pump. This will re-cycle the heat from the dwelling's ventilation system. These machines are ideal for apartments and are being considered for the scheme. The Air is drawn through ducts to the heat pump from the bathrooms, utility and kitchen areas. The cold waste air is discharged to outside through another duct, and condensation to a drain. Additional heat generated internally from lighting, people and domestic appliances is also utilised through heat recovery from outgoing exhaust air.
Low Energy LED Lighting	Shall be designed and specified in accordance with the BER requirements in each unit and in the landlord areas in accordance with Part L.	Lower consumption of energy and therefore lower carbon emissions.

Central Extract/ Demand-Controlled Ventilation	Central extract and demand-controlled ventilation will be considered to provide ventilation with low energy usage.	Central extract ventilation provides continuous ventilation with low energy usage. Central extract operates at a low trickle speed constantly and ramp up in response to an increase in humidity from wet areas. Demand control ventilation incorporates automated wall vents which open/close dependent on internal humidity conditions. While the houses will have natural ventilation MEV is being considered for the apartments.
PV Solar Panels	PV Solar Panels are being considered which capture energy from the sun and is turned into AC current for use. The panels are typically placed on the South facing side of the building for maximum heat gain and in some instances, can also be used to assist the heating system.	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 and could be considered combined with a Gas infrastructure for the Apartments.
Electric Car Charging Points	It is being considered to install ducting from a local landlord distribution board to designated E-car charging car park spaces. This will enable the management company the option to install E-car charging points within the carpark to cater for E-car demand of the residence. 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.	Providing the option of electric car charging points will allow occupants to benefit from the growing EV market. 

4.4 Materials

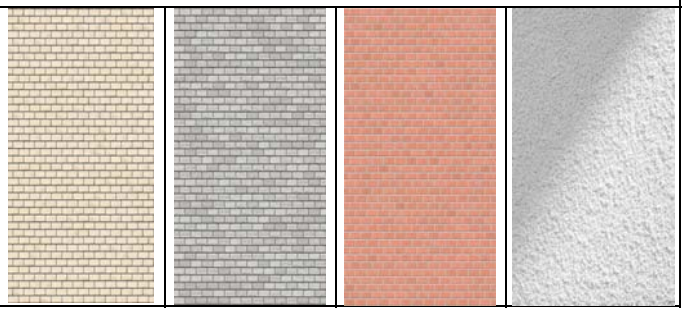
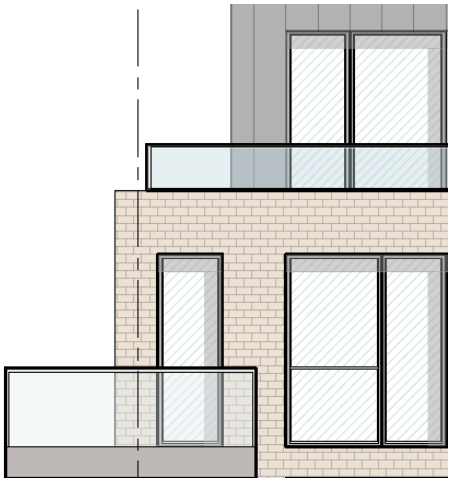
Measure Description	Benefit
Consideration is given to the requirements of the Building Regulations and includes reference to BS 7543:2015, 'Guide to Durability of Buildings and Building elements, Products and Components', which provides guidance on the durability, design life and predicted service life of buildings and their parts. All common parts of the proposed Apartment buildings and, the durability and performance of these are designed and specified in accordance with Figure 4; Phases of the Life Cycle of BS7543; 2015. (Please see Appendix 2 for this figure). 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.
The External Elevation materials comprise of: a) Brick (two colours) b) Render c) Aluminium Cladding All finishes selected require minimum maintenance.	

Figure 5: *SketchUp 3D model of the proposed development provided by the design team*

Use of factory finished and aluminium clad windows and doors as well as powder coated steel balconies with glazed balustrades. The Glazing will have a U-Value in line with Part L of the Building Regulations. 	Requires minimum on-going maintenance.

4.5 Landscaping

Measure	Description	Benefit
Paving and Decking Materials	Sustainable, robust materials, with high slip resistance to be used for paving. Durable and hardwearing equipment (e.g. play, exercise, fencing etc.) to be used throughout.	Robust materials and elements reduce the frequency of required repair and maintenance.
Soft Landscape	Planting proposals have been formulated to complement the local setting as well as being fit for purpose in respect of private and public realm uses and spatial constraints imposed by garden sizes and the width of planting strips. Native tree species have been selected in significant numbers for planting along boundaries and across open spaces while non-native species have also been selected where spatial constraints are a factor.	Reduction in the frequency of required soft landscape maintenance

Site Layout	High quality landscaping both hard surface (for the cycle /car parking and pavements) and soft landscaping with planting and trees. The landscaping will be fully compliant with the requirements for Part M / K of the Technical Guidance Documents and will provide level access and crossings for wheelchair users and pedestrians with limited mobility. Designated car parking including accessible & visitor car parking reduces the travel distances for visitors with reduced mobility.	Plenty of room for cycles and pedestrians along with car spaces provide a good balance between pedestrians and car users. .
Maintenance & Management	Maintenance and management requirements have been considered through the design process. Complex planting arrangements have been omitted thus avoiding onerous maintenance and management requirements	Estate maintenance costs reduced
Balconies & openable windows	Use of balconies & openable windows allow individuals to clean windows themselves	Reduces the cost and reliance on 3rd party contractors for cleaning & maintenance.

Figure 6: *Sample Landscape Area from Masterplan*

2.1 Health and Well Being.

Measure	Description	Benefit
Accessibility	All units, including access and egress, will comply with the requirements of Part M/K	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Private Open Space	Provision of Balconies, Communal Open Space, Play Space and a Local Park are all planned for the development.	Facilitates interaction with outdoors, increasing health benefits.
Bicycle Storage	The provision of private secure & covered bicycle parking facilities for each apartment.	Accommodates the uptake of cycling and reducing the reliance on the private motor vehicle.
Security	The scheme is designed to incorporate good passive surveillance with the following security strategies likely to be adopted: • Secure bicycle storage areas for each apartment; • CCTV for common areas; • Routine access fob audits	Access to all residents to reduce the risk of crime, littering within the scheme and reduction of potential waste charges.
Natural Amenity	A number of green spaces proposed throughout the scheme, connecting to a large active and passive area along the southern boundary.	Facilitates community interaction, socialising and play – resulting in improved wellbeing including a natural play area: 

Appendix 1

Appendix 2

ITEMS INCLUDED IN A TYPICAL BIF

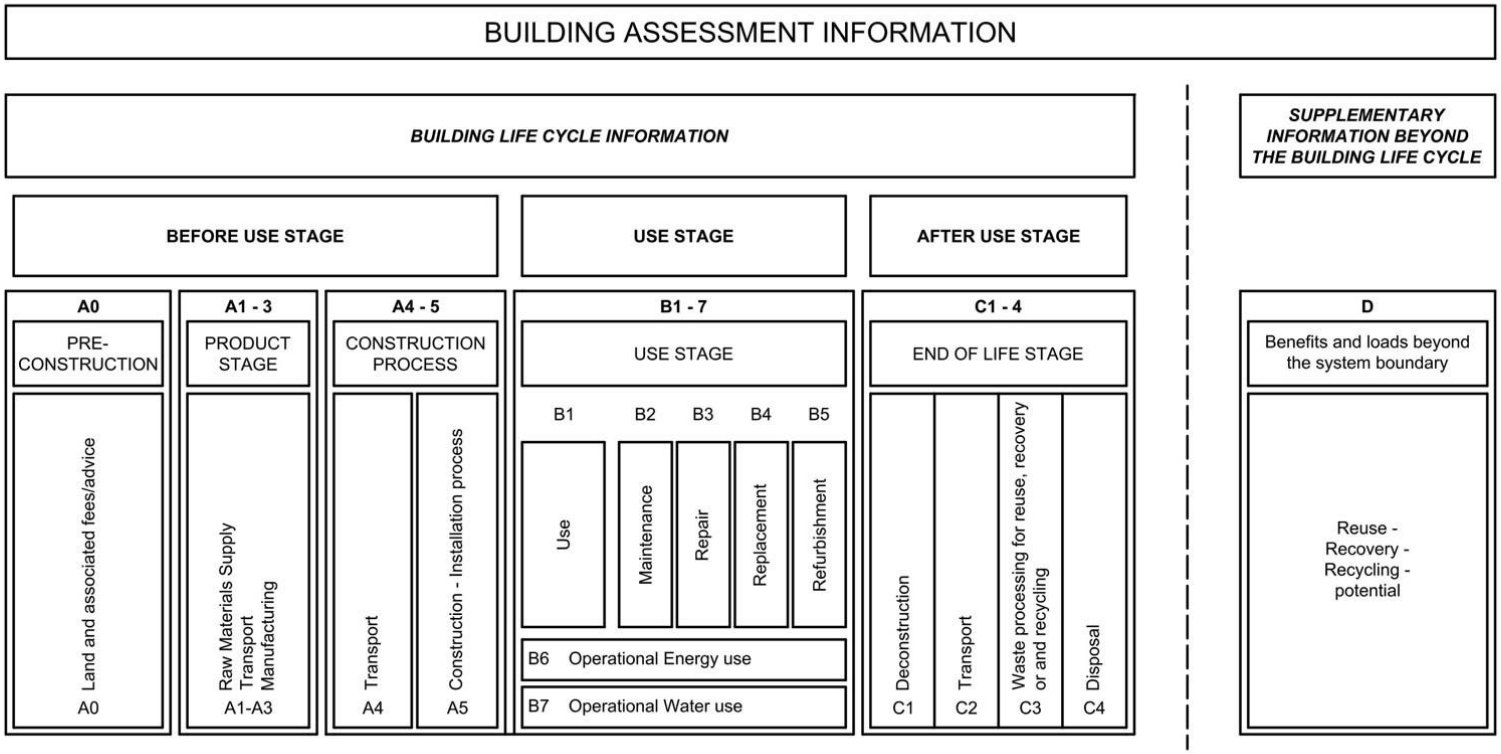
The BIF table below illustrates what would be incorporated for the calculation of a Sinking Fund.

	BUILDING INVESTMENT FUND (SINKING FUND) CALCULATIONS		
Ref	Element	Life Expectancy	Amount
1.00	**Roofs**		
1.01	Replacement felt roof covering incl. insulation to main roofs/ overhaul to green roofs.	18	
1.02	Replacement parapet details	18	
1.03	Replacement/ repairs to facias	18	
1.04	Replace roof access hatches	25	
1.05	Specialist Roof Systems - Fall arrest	25	
1.06	Overhaul waterproofing details to penthouse paved areas	12	
2.00	**Elevations**		
2.01	Recoat metal panels to penthouse apartments	25	
2.02	Minor repairs and preparation for decorations of rendered areas	18	
2.03	Replace exit/ entrance doors	25	
2.04	Replace Rainwater goods	25	
2.05	Recoat powder coated Finishes to balconies / Grills to Basement vents	20	
2.06	Periodic replacement and overhauling of external fixings	5	
2.07	Replace Balcony floor finishes	25	
3.00	**Staircores & lobbies (3 No. Cores)**		
3.01	Decorate Ceilings	7	
3.02	Decorate Walls	7	
3.03	Decorate Joinery	7	
3.04	Replace fire doors	25	
3.05	Replace carpets (stairwells & lobbies)	12	
3.06	Replace entrance mats	10	
3.07	Replace nosings	12	
3.08	Replace ceramic floors tiles Entrance lobbies	20	
3.09	Fixed Furniture & Equipment - Provisional Sum	18	

4.00	**Basement & Car Parking**		
4.01	Remove/ Replace ceiling insulation	25	
4.02	Repaint parking spaces & Numbering	7	
4.03	Replace store doors, ironmongery & digi-locks	15	
4.04	Replace Bike stands	25	
4.05	Replace basement access control at entrance & core entrances	12	
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 call points	18	
5.06	Replace Fire alarm panel	18	
5.07	Replace lift car and controls	25	
5.08	Replace AOV's	25	
5.08	Replace security access control installation	15	
5.09	Sump pumps replacement	15	
5.10	External Mains Water connection	20	
5.12	Electrical Mains and Sub Mains distribution	20	
5.13	Emergency Lighting	20	
5.14	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 cobblelock areas	18	
6.04	15-year cutback & thinning of trees. Overhaul landscaping generally	20	
6.05	Replace CCTV provision	12	
6.06	External Handrails and balustrade	18	

Appendix 2

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