COOLAGAD, GREYSTONES

BUILDING LIFE CYCLE REPORT

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Table of Contents

INTRODUCTION

The Sustainable Urban Housing; Design Standards for New Apartments – Guidelines for Planning Authorities were published 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 2020 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 proposed development consists of 586 residential units (351 houses; 203 apartments and 32 duplex units) at a site c. 26.03 ha at Coolagad, Greystones. The development will also include the provision of a community building (392 sqm), a creche, a sport field and a MUGA. A proposed new vehicular entrance with signalised junction from the R761 Rathdown Road to the north of Gate Lodge, Rathdown Road opposite Sea View and Redford Cemetery, providing a distributor road as part of the long-term objective to provide a northern access route from Greystones to the N11 is also proposed. The development also includes site development infrastructure, a hierarchy of internal streets including bridges, cycle paths & footpaths; new watermain connection and foul and surface water drainage; the development also provides for the upgrading of the public sewer within the wayleave of the R761/R762 (Rathdown Road) from the site entrance as far as the R762 in front of St. Kevin's National School, Rathdown Road, Greystones.

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, including communal areas of open space, and any public areas not taken in charge by the local authority, 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 15 years and in the form prescribed by the Property Services Regulatory Authority (PRSA).

The Property Management Company also has the following responsibilities for the 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.
- After Hours Services.
- Staff Administration.

1.2. 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 (“MUD” 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 MUD 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 A.

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.

<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/A3 rating for the dwellings this will equate to the following emissions.

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</td><td>Higher BER ratings reduce energy consumption and running costs.</td></tr>
<tr><td>Fabric Energy Efficiency</td><td>Building Fabric Performance

The U-values being proposed will be in line with the requirements set out by the current regulatory requirements of the Technical Guidance Documents Part L 2021 “Conservation of Fuel and Energy Buildings other than Dwellings”.

U-values

The U-Values that will be targeted for the dwellings in this development will exceed the minimum targets set out in Part L 2021. The table below sets out the minimum requirements of each of these standards and the targets range that will be adopted for the site.

<table>
<tr><th>U-Values</th><th>Range of Target Values Proposed</th><th>Part L 2019 Compliant Values</th></tr>
<tr><td>Floor</td><td>0.10 to 0.18 W/m2K</td><td>0.18 W/m2K</td></tr>
<tr><td>Roof (Flat)</td><td>0.15 to 0.18 W/m2K</td><td>0.20 W/m2K</td></tr>
<tr><td>Roof (Pitched)</td><td>0.11 to 0.16 W/m2K</td><td>0.16 W/m2K</td></tr>
<tr><td>Walls</td><td>0.12 to 0.18 W/m2K</td><td>0.18 W/m2K</td></tr>
<tr><td>Windows</td><td>1.2 to 1.4 W/m2K</td><td>1.4 W/m2K</td></tr>
</table>

Thermal Bridging

Thermal bridges occur at junctions between planar elements of the building fabric and are typically defined as areas where heat can escape the building fabric due to a lack of continuity of the insulation in the adjoin elements.
Careful design and detailing of the manner in which insulation is installed at these junctions can reduce the rate at which the heat escapes. Standard good practice details are available and are known as Acceptable Construction Details (ACDs). Adherence to these details is known to reduce the rate at which heat is lost.</td><td>Lower U-values and improved air tightness is being considered to help minimise heat losses through the building fabric, reduce the energy consumption and thus minimise carbon emissions.</td></tr>
</table>

Measure	Description	Benefit
	The rate at which heat is lost is quantified by the Thermal Bridging Factor of the dwelling which is entered into the overall dwelling Part L calculation. It is intended that all building junctions will either be designed in accordance with the Acceptable Construction Details (issued by The Department of the Environment) or that thermal modelling will be carried out for all thermal bridges on the dwellings within proposed development. The resultant Thermal Bridging Factor will be in the range of 0.04W/m2K to 0.08W/m2K. Air Tightness A major consideration in reducing the heat losses in a building is the air infiltration. This essentially relates to the ingress of cold outdoor air into the building and the corresponding displacement of the heated internal air. This incoming cold air must be heated if comfort conditions are to be maintained. In a traditionally constructed building, infiltration can account for 30 to 40 percent of the total heat loss, however construction standards continue to improve in this area. In order to ensure that a sufficient level of air tightness is achieved, air permeability testing will be specified carried out on all dwellings. A design air permeability target of 3 m3/m2/hr has been identified for the apartments and houses on the site.	
Energy Labelled White Goods	The white good package planned for provision in the apartments and houses 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	The provision of high rated appliances in turn reduces the amount of electricity required for occupants.
External Lighting	The proposed lighting scheme within the development consists of 8m and 6m pole mounted fittings as indicated on the drawings. The luminaire selected is the CU Phusco P862 & P852 fitting, this fitting was selected for the following reasons; • Low level lighting • Minimal upward light spill • Low voltage LED lamps • Pre-approved by Wicklow County Council Each light fitting shall be controlled via an individual Photoelectric Control Unit (PECU). The operation of the lighting shall be on a dusk-dawn profile.	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 in the area. Having PECU allows for the optimum operation of lighting which minimizes energy consumption.

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 on and then implemented to achieve the A2/A3 BER Rating.

Measure	Description	Benefit
Duplex, Housing units, Creche and Community Building - Air Source Heat Pumps	Air source heat pumps (ASHPs) utilise grid supplied electricity to extract thermal energy from a heat source, in this case, the external ambient air. While the electricity consumed is not renewable energy, the efficiency at which a heat pump operates allows a significant portion of the heat delivered to be considered as renewable energy. The amount of heat considered to be renewable is determined by the efficiency of the heat pump and the "primary energy conversion factor" for grid supplied electricity. Typically, approximately 40% to 50% of the heat supplied is considered to be renewable energy. Air source heat pumps require an indoor and an outdoor component. The outdoor unit is the evaporator which extracts the thermal energy from the ambient air while the indoor unit typically includes the heating buffer tanks and the hot water cylinder for the dwelling. The outdoor unit is typically located in the back garden of a dwelling.	Heat pumps provide a highly efficient means of providing heating and hot water to the dwellings without the consumption of fossil fuels on site
Apartments – Option 1 Exhaust Air Heat Pumps	Exhaust Air heat pumps (EAHPs) operate in a very similar manner to air source heat pumps and utilise grid supplied electricity to extract thermal energy from a heat source, in this case, the internal air within the apartment. Each apartment will be provided with an exhaust air heat pump which will provide heating, hot water and ventilation. These units are ideally suited to apartments and smaller dwellings. Warm air is extracted from all wet rooms, (at a volume which is compliant with Part F of the Building Regulations) and the air is then passed through the heat pump where the waste heat energy is extracted. The energy is then used to generate hot water for space heating and domestic hot water. The units do consume electrical energy, however they operate at very high efficiencies such that a large percentage of the heat produced can be considered to be electric.	Heat pumps provide a highly efficient means of providing heating and hot water to the dwellings without the consumption of fossil fuels on site.
Apartments – Option 2 District Heating	This approach would involve the generation of heat in a central location within the apartment blocks and the distribution of this heat to each apartment via a network district heating pipework. The central plant used to generate the heat could include Air Source Heat Pumps, Combined Heat and Power (CHP) plan and high efficiency gas fired condensing boilers. Operating these systems in a manner that prioritises heat pumps and CHP units will minimize energy consumption and carbon emissions	The appropriate combination of heat pumps and CHP will provide a heating system capable of generating heat and hot water with low carbon emissions
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.	PV Solar Panels offer the benefit of reducing fossil fuel consumption and carbon emissions to the environment. They also reduce the overall requirement to

Measure	Description	Benefit
	The panels are typically placed on the South facing side of the building to maximise the solar exposure.	purchase electricity from the grid.
Demand Controlled Mechanical Ventilation	Centralised mechanical ventilation will be provided to all dwellings to ensure that the air quality within the dwellings will be adequate. The system will be designed to respond to occupancy usage patterns and to humidity levels within the dwelling. This will be a stand-alone system in the duplex units and will be integral to the exhaust air heat pumps in the apartments.	Mechanical ventilation provides enhanced air quality in modern air tight dwellings which are otherwise designed to minimise unwanted air infiltration
E-car Charging Points	The proposed non-residential development for the creche and community buildings shall have one functioning charging point (capable of serving 2 parking spaces) provided for each building with future provision of at least 4no to 6 no other spaces. The location of the charging point will be such that it can serve one accessible parking space and one standard parking space. The proposed multi-unit residential development shall have future provision for all spaces. .	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 and glazing.

2.2.1 Buildings

Buildings are designed in accordance with the Building Regulations (Part D Amendment) Regulations 2013, 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 provided to stair cores and corridors where possible.	Avoids the requirement for continuous artificial lighting
Openable window sections are provided to all stair cores within the development providing Natural/Passive ventilation to common circulation areas.	Openable window sections are provided to all stair cores within the development providing natural daylight and ventilation throughout all common areas. Avoids costly mechanical ventilation systems and associated maintenance and future replacement.

External paved and landscaped areas	All of these require low/minimal maintenance
Roof construction includes significant areas of traditional pitched roofs to the duplex and housing units.	Minimises ongoing 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. All common parts of the proposed 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 B 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 primary façade material of the apartment blocks is brickwork, with some areas of render. There will also be feature areas of pressed metal sheeting at amenities and building entrances. The render system specified will have algae and mould resistant properties which would result in low maintenance and counteract staining and discolouration.	These traditional materials will require minimal on-going maintenance and have a longer life-cycle expectancy.
Use of factory finished and uPVC windows and doors.	Requires no on-going maintenance.

2.3 Landscape

Measure	Description	Benefit
Site Planning	Generous and high-quality landscape inclusive of native habitats designed within the proposed development. A large area of communal garden and public parkland space is to be created. Significant tree planting and soft landscaping within courtyards and public spaces which will incorporate a SuDS, pond and wetland edge.	Natural attenuation and landscape maintenance preferable

Green Roofs	Use of green roofs and traditional roof coverings with robust and proven detailing to roof elements.		**Green Roofs**
Paving Materials	Use of 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. Within the key landscape spaces, a cohesive and robust suite of paving and furniture materials integrated with a considered soft landscape design are to provide for a flexible and long-lasting public and communal spaces.		Required ongoing maintenance significantly reduced through use of robust materials installed with proven details.
Planting details	Suitable plant species and specification combined with the provision of adequate soil growing medium, both into ground and over podium, are to ensure a well-established planting scheme.		Correctly specified planting will develop into well established and robust soft landscape reducing future maintenance.

2.4 Waste Management

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

Measure	Description	Benefit
Construction and Demolition Waste Management Plan	The application is accompanied by an Outline Construction and Demolition Waste Management Plan prepared by AECOM.	The report demonstrates how the scheme has been designed to comply with best practice.
Operational Waste Management Plan	The application is accompanied by an Operational Waste Management Plan prepared by Enviroguide Ltd.	The report demonstrates how the scheme has been designed to comply with best practice.
Storage of Non-Recyclable Waste and Recyclable Household Waste	Residential waste storage allows for a weekly (seven day) storage capacity for MDR, food, glass and residual (i.e. nonrecyclable). Residential bins will be provided within dedicated storage rooms within the core of each residential block.	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 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
Natural / Day Light	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.
Accessibility	All units will comply with the requirements of Part M/K and a universal access statement is provided as part of this application.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Natural Amenity	Large public areas of open space are evenly distributed throughout the site where they can be overlooked by surrounding residential units.	Facilitates community interaction, socialising and play – resulting in improved wellbeing
	Connections to local amenity.	Proximity and use of parks promote a healthy lifestyle.

2.6 Management

Consideration has been given to the ensuring the 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: • **Homeowner manual** – 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 utility connections/communication providers, contact details for all relevant suppliers, and user instructions for appliances and devices in the property. • **A 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.

2.7 Transport

Measure	Measure Description	Benefit
Access to Public Transport (DART)	The Greystones Dart station is located 2.1 km away within a convenient cycling distance of the proposed residential development. DART services run through the city to Malahide	The DART provides an alternative high frequency public transport option to the bus for commuting to the city center. The availability, proximity and ease of access to

	& Howth with regular services throughout the day serving the stations along the routes.	high quality public transport services contributes to reducing the reliance on the private motor vehicle for all journey types.
Access to Public Transport (Bus Services)	Local bus services operate near the subject development site. The closest bus stops are located north of the site on the R761, c. 80m away. They are served by the number 184 and 84 bus routes. There is a second stop, which is 260m from the development entrance and has additional routes stopping there. The stop is served by scheduled routes 84 and 184, by the route 84X (which operates to Dublin City at peak times only) and the Route 702 Aircoach service to Dublin Airport.	These bus services provide access to a range of additional destinations above that serviced by Irish Rail services. The proximity, frequency and range of additional destinations served by these local bus services enhance the accessibility levels of the proposed residential development in addition to providing a viable and practical sustainable alternative to journeys undertaken by the private motor car.
Permeable Connections	Provision and subsequent maintenance of dedicated pedestrian and cycle infrastructure on-site, with provision of future connections to adjoining lands, providing convenient access to local services including shops, schools, restaurants and doctor's surgeries.	Ensure the long-term attractiveness of walking and cycling to a range of local education, retail and community facilities/services.
Bicycle Storage	The provision of high quality secure bicycle parking facilities, for both short term and long-term parking requirements.	Accommodates the uptake of cycling and reducing the reliance on the private motor vehicle.
E-car Facilities	Ducting will be provided to designated E-car charging car park spaces.	To accommodate the growing demand for E-car which assist in decarbonising society and reducing oil dependency.
Car Share	Car share spaces are proposed to be included in the development.	The availability and ease of access to car share facilities contributes to reducing the reliance on the private motor vehicle.

APPENDIX A:

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	

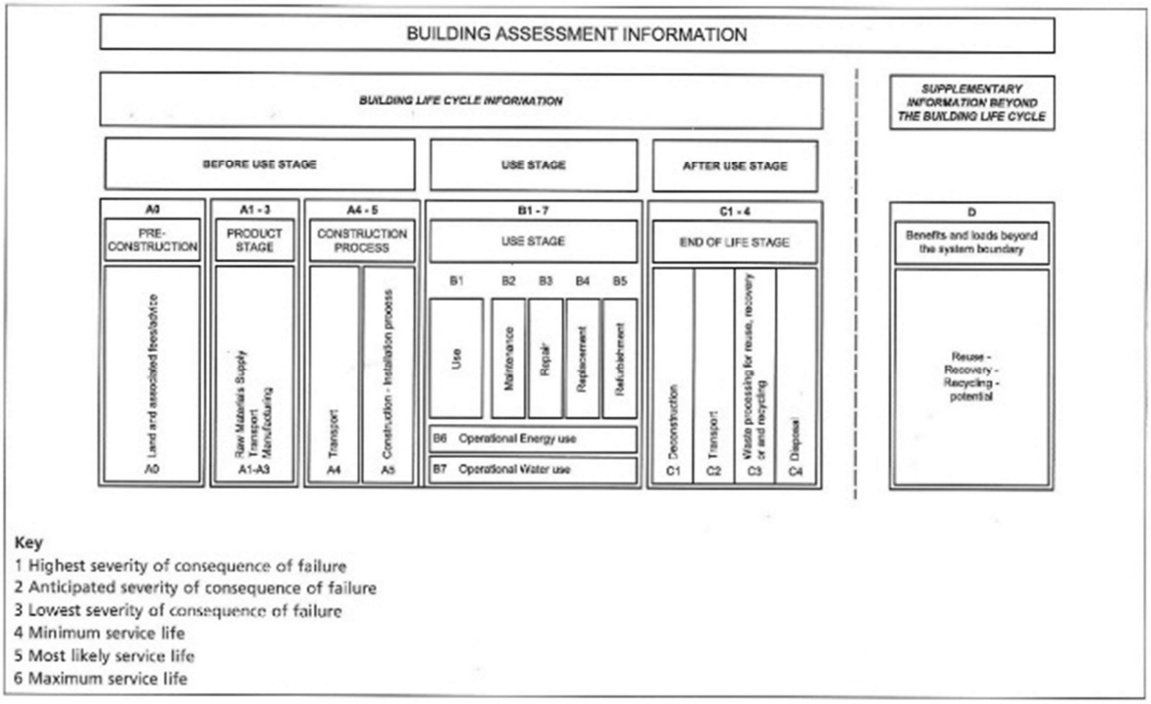
3.05	Replace carpets (stairwells & lobbies)	12	
3.06	Replace entrance mats	10	
3.07	Replace nosings	12	
3.08	Replace ceramic floors tiles Entrance lobbies	20	
3.09	Fixed Furniture & Equipment - Provisional Sum	18	
4.00	**Car Parking**		
4.02	Repaint parking spaces & Numbering	7	
4.04	Replace Bike stands	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 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 B:

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