BUILDING LIFE CYCLE REPORT

Newcastle South

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Newcastle South

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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 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

Cairn Homes Properties Ltd., intend to apply to An Bord Pleanála for a 7 year planning permission for a strategic housing development at this site within the townland of Newcastle South, Newcastle, Co. Dublin, on lands of c. 8.47 hectares (2 no. sites comprising main development site (8.4 ha.) and site relating to creche c. 0.07 ha. in 'Graydon'.

The development will consist of the construction of 280 no. dwellings, a creche, and open space as follows:

A) 128 no. 2 storey houses (8 no. 2 bedroom houses, 94 no. 3 bedroom houses, 25 no. 4 bedroom houses and 1 no. 5 bedroom house;
B) 116 no. apartments in 2 no. 5 storey buildings comprising (54 no. 1 bedroom apartments & 62 no. 2 bedroom apartments, all with terrace or balcony along with solar panels and green roofs at roof level as well as telecommunications infrastructure comprising 9 no. support poles on ballast mounts (to accommodate 1No. 2m 2G/3G/4G antenna & 1No. 5G antenna each) & 3 no. poles on lift overrun (to accommodate 2No. Ø0.3m Microwave links each at roof level of Apartment building B, together with associated equipment and cabinets/shrouds);
C) 36 no. apartments/duplex apartments in 3 no. 3 storey buildings – (18 no. 2 bedroom apartments and 18 no. 3 bedroom duplex apartments) all with terrace;
D) Amendment to permitted Creche (c. 518sqm) in 'Graydon' (ABP References: TA06S.305343 & ABP-305343-19) to now provide a Creche of c. 778 sq. m of 2 no. storeys;
E) Open space, hard and soft landscaping (including public lighting & boundary treatment), communal open space for duplex apartments and apartments; along with single storey bicycle/bin stores and ESB substations;
F) Vehicular access from the Athgoe Road from a new signalised junction along with upgrades to footpath and pedestrian crossing as well as provision of vehicular/pedestrian/cycle link to permitted 'Graydon' (TA06S.305343) 'Newcastle Boulevard' to the east, as well as 423 no. car parking spaces and 370 no. bicycle spaces and all internal roads, cycleways, green routes and paths;
G) Provision of Surface water attenuation measures and underground attenuation systems, connection to water supply, and provision of foul drainage infrastructure as well as underground local pumping station to Irish Water specifications and all ancillary site development/construction/landscaping works.

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 PSRA.

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

- Timely formation of a 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).

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 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></td></tr>
<tr><td>Fabric Energy Efficiency</td><td>The U-values being investigated will be in line with the requirements set out by the current regulatory requirements of the Technical Guidance Documents Part L, titled “Conservation of Fuel and Energy Buildings other than Dwellings”.

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

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

Pitched roof
- Insulation at ceiling
- Insulation on slope

Flat roof</td><td>

0.16
0.16

0.20</td><td>

0.3</td></tr><tr><td>Walls</td><td>0.21</td><td>0.6</td></tr><tr><td>Ground floors[3]</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[4]</td><td>3.0</td></tr></table>Notes:
1. The U-value includes the effect of unheated voids or other spaces.
2. For alternative method of showing compliance see paragraph 1.3.2.3.
3. For insulation of ground floors and exposed floors incorporating underfloor heating, see paragraph 1.3.2.2.
4. Windows, doors and rooflights should have a maximum U-value of 1.6 W/m²K when their combined area is 25% of floor area. However areas and U-values may be varied as set out in Table 2.</td><td>Lower U-values and improved air tightness is being considered to help minimise heat losses through the building fabric, lower of energy consumption and thus minimise carbon emissions to the environment.</td></tr>
<tr><td>Energy Labelled White Goods</td><td>The white good package 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 below appliance ratings will be provided:
Oven - A plus
Fridge Freezer - A plus
Dishwasher - AAA
Washer/Dryer - B</td><td>The provision of high rated appliances in turn reduces the amount of electricity required for occupants.</td></tr>
<tr><td>External Lighting</td><td>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; 15
Low level lighting
Minimal upward light spill
Low voltage LED lamps
Pre-approved by South Dublin County Council</td><td>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.</td></tr>
</table>

Measure	Description	Benefit
	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.	Having PECU allows for the optimum operation of lighting which minimizes costs.

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

Measure	Description	Benefit
	street parking spaces. This system operates on a single charge point access card. A full re-charge can take from one to eight hours using a standard charge point.	
Natural Ventilation	Natural ventilation is being evaluated as one ventilation strategy to minimise energy usage and noise levels.	The main advantages of natural ventilation are: • Completely passive therefore no energy required. • Reduced environmental impact as minimal equipment disposal over life cycle.

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

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

Measure Description	Benefit
Daylighting to circulation areas.	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 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	Ensures that the long-term durability and maintenance of Materials is an integral part of the Design and Specification of the proposed development.

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	
The architectural approach to the scheme proposed the extensive use of robust materials of brickwork and render to the building envelope.   	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 and powder coated steel balconies.	Requires no on-going maintenance.

2.3 Landscape

Measure	Description	Benefit
Site Layout and Design	Generous and high-quality mature landscape with ecological corridors designed within the proposed development. Pedestrians prioritized over the car. Significant street tree planting and soft landscaping within courtyards and public spaces.	SUDs drainage system and landscape maintenance preferable.
Green Roofs	Use of green roofs and traditional roof coverings with robust and proven detailing to roof elements. 	Attenuation reduces the burden on vulnerable rainwater goods, resulting in fewer elements that could require replacement or repair.
Paving and Decking 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.	Require no on-going maintenance.
Planting details	Proven trees staking details. Shrub, hedging, herbaceous and lawn installation planting details provided.	Correctly installed 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 a Construction and Demolition Waste Management Plan prepared by Byrne Environmental Consulting Ltd.	The report demonstrates how the scheme has been designed to comply with best practice.
Storage of Non-Recyclable Waste and Recyclable Household Waste	Inclusion of a centralized underground and surface bin storage systems.	Easily accessible by all residents and minimizes 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.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Security	The scheme is design to incorporate passive surveillance with the following security strategy likely to be adopted: • CCTV monitoring details • Car registration recognition at entrance to the basement carpark. • Secure bicycle stands – covered by CCTV • Routine access fob audits	Help to reduce potential security/management costs.
Natural Amenity	Public open space.	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 residents have a clear understanding of the property.

Measure	Description	Benefit
Home Owner 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 (Rail)	The Hazelhatch Train Station stop is located within a convenient distance of the proposed residential development.	The availability, proximity and ease of access to high quality public transport services contributes to reducing the reliance on the private motor vehicle for all journey types.
Access to Public Transport (Bus Services)	A total of 2 local Dublin bus services operate in close proximity to the subject development site on the main street.	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, and their connectivity with adjoining third party lands and the off-site networks, 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.
Motorcycle Parking	The implementation of secure, attractive, best practice motorcycle parking facilities for residents.	Reduces the reliance on the private motor vehicle in parallel with reducing oil dependency.

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.

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	

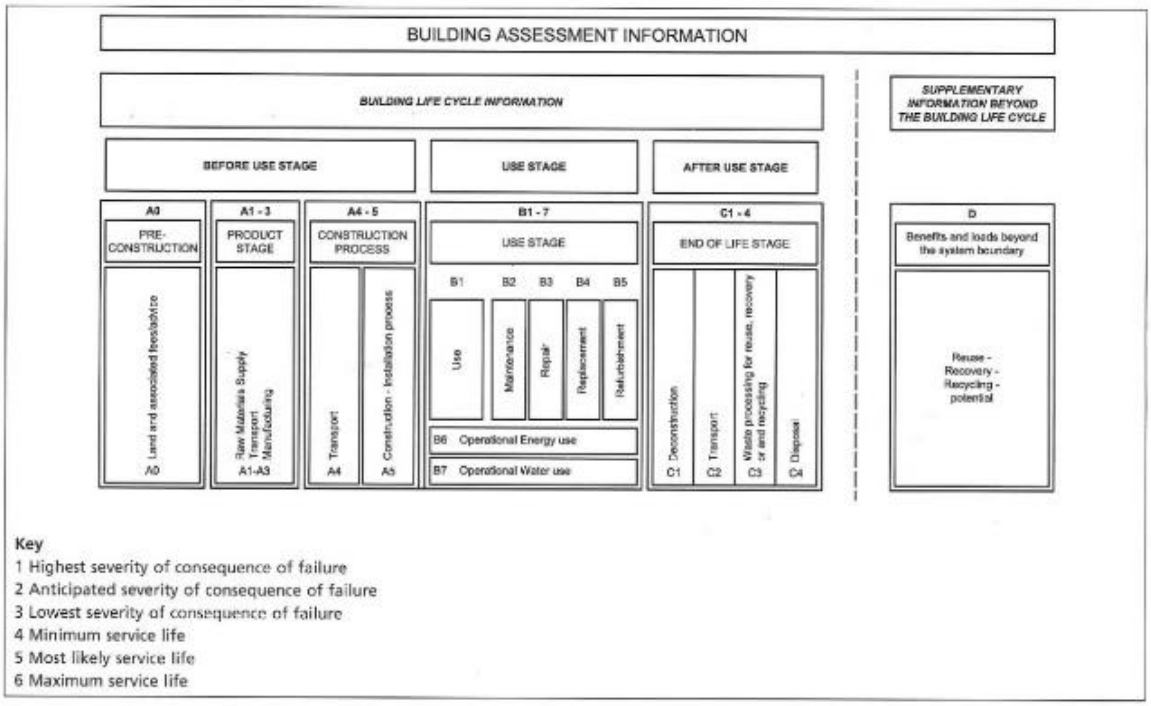
3.05	Replace carpets (stairwells & lobbies)	12	
3.06	Replace entrance mats	10	
3.07	Replace nosings	12	
3.08	Replace ceramic floors tiles Entrance lobbies	20	
3.09	Fixed Furniture & Equipment - Provisional Sum	18	
4.00	**Basement & Car Parking**		
4.01	Remove/replace ceiling insulation	25	
4.02	Repaint 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	
4.06	Repaint parking spaces & Numbering	7	
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