

# BUILDING LIFECYCLE REPORT

for

RESIDENTIAL DEVELOPMENT AT STONEY  
HILL ROAD, RATHCOOLE, CO. DUBLIN



# VIRTUS

9

June 2020



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## 1.0 INTRODUCTION AND TERMS OF REFERENCE

1.1 This Building Lifecycle Report is provided in compliance with the requirements of Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (March 2018).

1.2 Section 6.13 of the Guidelines requires that planning applications for apartment developments 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, as well as demonstrating what measures have been specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents”.*

1.3 This Building Lifecycle Report responds the requirements set out in Section 6.13 of the Apartment Guidelines.

1.4 Whilst it is noted that the proposed development comprises a mix of apartments and houses, it is considered appropriate that this Lifecycle Report refers to the scheme in its entirety. There are benefits to a sustainable lifecycle approach to all typologies in the scheme.

1.5 This report has been compiled by Virtus Project Management with inputs from:

- Romeville Developments Limited (the applicant)
- C&W O’Brien Architects
- Mande Consulting Engineers
- Aecom
- Doyle & O’Troithigh Landscape Architects

## 2.0 DESCRIPTION OF PROPOSED DEVELOPMENT

- 2.1 The development comprises of the demolition of 5 no. existing residential properties and associated outbuildings and will consist of the construction of a residential development of 204 no. units, comprising 151 no. houses (including duplexes) and 53 no. apartments.
- 2.2 The houses comprise of 7 no. typologies with a total of 123 no. units with a mix of semi-detached and terrace units and with a breakdown of 111 no. 3 bed units and 12 no. 4 bed units. Typologies F, H, L and M are two storey, typologies D, G and K are two storey plus dormer windows.
- 2.3 The duplex units comprise a total of 28 no. 3 storey units in a terrace arrangement with 10 no. two bed house units and 18 no. 3 bed house units, all below apartments at second floor level. The apartments above the duplex units comprise of 10 no. 2 bed units and 4 no. 3 bed units.
- 2.4 There are an additional 39 no. apartments in a single block comprising of 10 no. 1 bed units, 23 no. 2 bed units and 6 no. 3 bed units located in a single four storey, over basement/undercroft parking, block (with a setback top floor) to the north-west of the application site. The basement for the apartment block includes 49 no. car parking spaces, 87 no. bicycle parking spaces, circulation, plant areas, refuse storage areas and other associated facilities. There are an additional 12 no. visitor bicycle parking spaces for the apartment block provided at surface level. Access to the apartment block is directly from Stoney Hill Road via a new access from an existing dropped kerb.
- 2.5 The development also includes:
- (i) 306 no. surface car parking spaces (total car parking provision of 355 no. spaces including 49 no. spaces at the apartment block),
  - (ii) 169 no bicycle parking spaces (comprising of 99 no. spaces at basement and surface for the apartment block, 60 no. secure spaces for the apartments in the duplex units, and 10 no. visitor parking spaces at surface level),
  - (iii) communal open space for the apartments, public open space including a children's playground and a linear park to the south of the site,
  - (iv) new vehicular entrances from Stoney Hill Road (one to the apartment building to the north of the site at Stoney Hill Road and a second to the remainder of the development further south on Stoney Hill Road),
  - (v) a separate pedestrian and cycle access adjacent to the existing roundabout on Stoney Hill Road to the north-west of the site,
  - (vi) internal vehicular routes to include footpaths and cycleways,
  - (vii) 3 no. ESB substations (including 1 no. integral to the apartment building),
  - (viii) refuse/bin stores, public lighting, boundary treatment,
  - (ix) provision of potential pedestrian/cycle linkages to Rathcoole Park to the north,
  - (x) drainage and civils works to facilitate the development, and

- (xi) all other associated and ancillary development/works. The total gross floorspace of the development described above is circa 23,042.73 sq.m.

2.6 The proposed development also includes a 2 no. storey crèche building of 639.2 sq.m plus an outdoor play area of 624.31 sq.m located on an existing undeveloped portion of the Peyton site located to the west of Stoney Hill Road. The crèche includes 10 no. car parking spaces and 20 no. bicycle parking spaces. The crèche development includes all associated and ancillary works.

### **3.0 ASSESSMENT OF LONG TERM RUNNING AND MAINTENANCE COSTS**

#### **3.1 Property/Owners Management Company and Common Areas**

3.1.1 A Property Management Company will be engaged at an early stage of the development to ensure that all property management functions for the development are identified and agreed and that the maintenance and running costs of the development's common areas are kept within agreed budgets. The Property Management Company will enter into a contract directly within the Owners Management Company (OMC) for the ongoing management of the completed development (it is intended that this contract will be for a period of c. 1 – 3 years and in the form prescribed by the PSRA). The OMC will be incorporated by the developer in accordance with the Multi Unit Development (MUD) Act 2011 and all apartment purchasers will be obliged to become members of the OMC.

3.1.2 The Property Management Company will have the following responsibilities for the apartment development once completed:

- Preparation of annual service charge budgets for the development's common areas including sinking funds for lifts and building fabric repairs & maintenance.
- Apportioning of the annual operational charges in line with the MUD Act 2011 (equitable division).
- Engagement of independent legal representation on behalf of the OMC in keeping with the MUD Act 2011 – including completion of Developer OMC Agreement and transfer of the common areas.
- Insuring the common areas.
- Refuse collections.
- Servicing and maintaining the attenuation system including the stormcell, petrol interceptor and hydrobrake flow control device.
- Maintaining and repairing all infrastructure in the common area including: road, paving, paths, public lighting, sewers, manholes, underground services (electrical, comms, gas, etc).
- Maintenance of all mechanical and electrical systems outside of individual apartments.
- Maintenance of the building fabric.
- Servicing and repair of gates/doors including the access control system.
- Cleaning of common areas and windows.

- Car park management.
- General landscaping and upkeep of the common areas including: cutting lawns, pruning shrubs and plants, clearing litter and leaves, painting external boundary walls that are within the common areas.
- Third party contractors procurement and management.
- Collection of the service charge.
- Financial reporting, accounts and financial returns.
- Reporting to the OMC.

### **3.2 Service Charge Budget**

- 3.2.1 The Property Management Company will have a number of key responsibilities, most notably the compiling of the service charge budget for the development for agreement with the OMC.
- 3.2.2 In accordance with the MUD Act 2011, the service charge budget typically covers items such as cleaning, landscaping, external lighting, management of centralised plant, refuse management, utility bills, insurance, maintenance of mechanical, electrical, lifts, life safety systems, security, property management fee within the development common areas.
- 3.2.3 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 by the OMC.
- 3.2.4 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, as required by the MUD Act, 2011. In line with the requirements of the MUD Act 2011, 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.
- 3.2.5 Notwithstanding the above, it should be noted that the detail associated with each element heading in the BIF report, can only be determined after detailed design and the procurement and construction of the development.

## 4.0 MEASURES TO MANAGE & REDUCE COSTS

### 4.1 Treatments, Materials & Finishes

4.1.1 The practical implementation of the Design and Material principles has informed the design of the building envelope, internal layouts, facades and detailing has informed the materiality of the proposed development.

#### Housing Units

4.1.2 The proposed envelope of the housing units is brick, with aluminium double glazed window units and a concrete tiled roof. Based on comparison with similar schemes developed, the proposed materials are durable and would not require regular replacement or maintenance.

#### Apartment Units

4.1.3 The proposed envelope of the apartments block is comprised of a mixture of brick, zinc cladding, factory applied powdered coating feature steelwork and toughened glass balustrades, with aluminium double glazed window units and roofed with a Green Roof. Bio-diverse roofs are an excellent method of encouraging new wildlife into the development. These roofs can also help improve air quality, reduce the heat island effect and attenuate roof surface run-off, supporting Water Sensitive Urban Design (WSUD) approaches to developments. Based on comparison with similar schemes developed, the proposed materials are durable and would not require regular replacement or maintenance.

Materials have been selected with a view to longevity, durability and low maintenance. Consideration has been given to the current Building Regulations and includes reference to BS 7543:2015 "Guide to Durability of Buildings and Building elements, Products and Components".

### 4.2 Buildings

4.2.1 The proposed apartment building is 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 housing units, the apartment units and the communal / amenity parts of the development.

### Housing Units

- 4.2.2 There is a total of 151 housing units in the proposed development. This comprises of 10no. 2 bed duplex units, 18no. 3 bed duplex units, 111no. 3 bed houses and 12no. 4 bed houses. Each unit has a rear garden, in compliance with the Development Plan objectives and landscaping to the front where possible. The majority of units have secure access points and passageways to the rear private open space.

### Apartment Units

- 4.2.3 There is a total of 53 apartment units in the proposed scheme. 39 apartments are contained within a standalone apartment block, comprising 10no. 1 bed units, 23no. 2 bed units and 6no. 3 bed units. There are generally 11 apartments per floor, over a total of 3 stories, with set back fourth level. Each apartment benefits from a private amenity space, in the form of a balcony or terrace and has open space living areas and adequately sized bedrooms. Due consideration has been given to the orientation of the apartments to ensure each apartment receives adequate natural daylight. 54.5% of the apartments are dual aspect. Car & bicycle parking, plant room and waste facilities are provided in the basement. Communal amenity space for the apartments is located to the South and West of the block, optimizing the natural sunlight. The remaining 14 apartments are contained on the top floors of the duplex units and consist of 10no. 2 bed units and 4no. 3 bed units. Each unit has access to a large private terrace, with communal waste facilities located at ground level.

## **4.3 Construction Methodology**

### Housing Units

- 4.3.1 The design undertaken for the units allows for the flexibility of masonry or timber frame construction. This will be dependent on time of construction. Externally, the units will be finished in selected brickwork, and pre coloured render finish for selected units. Selected Upvc or similar joinery windows and doors are the secondary building elements.

### Apartment Units

4.3.2 The construction methodology proposed with high quality detailing and materials will maximise efficiency and indoor environment quality. The structural scheme for the proposed building consists of masonry construction, finished in brick or partially metal cladding. A flat roof system and associated sedum/ green roof system is proposed on tapered insulation designed to fall on the concrete slab. Selected Upvc or similar joinery windows and doors and powder coated balcony structure with flat rail balustrade to balconies are the secondary building elements that will help reduce construction and maintenance costs throughout the lifecycle of the building.

### **4.4 Material Specification**

4.4.1 Due consideration has been given to the requirements of all Building Regulations in relation to durability and design life. The development is designed to incorporate the guidance and best practice principles to ensure that the long-term durability and maintenance of materials is an integral part of the design and specifications of the proposed development.

### Housing Units

4.4.2 A mix of high quality brickwork and pre coloured render is proposed for the external facades of the units. These materials will not require ongoing maintenance or associated costs. The use of factory finished uPVC windows and external doors, along with concrete roofing tiles will also reduce ongoing maintenance costs.

### Apartment Units

4.4.3 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. 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. This allows for long-term durability and maintenance of materials as an integral part of the design and specification of the proposed development.

## 4.5 Landscaping

### Site Landscape planning

- 4.5.1 The design intent for the landscape draws from many items; including the relationship between the existing environment and envisaged scheme and the immediate surrounding environment. The design intent it to develop a landscape which will enrich the lives of the residents of the development, both in the short to long term.
- 4.5.2 A central core principal of the landscape design intent is the development of positive open spaces.

### The design of positive open space

- 4.5.3 Public spaces between buildings influence both the built form and the civic quality of the development. A balanced approach to the design of the public space, centered on the relationship between the buildings and their surrounding open space, will allow for the design, development and management of a public realm which can be used for a variety of amenities throughout the year; and in doing so, adding to the quality of life of the future end users.
- 4.5.4 The design of public open space must be 'open minded', in that it does not try to define specific activities but can accommodate a range of them. Whether large or small, good open space shall be human in scale.
- 4.5.5 Research undertaken for the UK's Commissions for Architecture and the Built Environment has shown that good quality public open space makes a tangible difference to people's lives.
- 4.5.6 Landscape design considerations have included:
- Manipulating the external environment to enhance the outdoor experience for all residents.
  - Working with the site settings, considering the influence of the elements and positioning amenity areas with consideration to aspect and micro-climate, and in doing so adding value to the landscape.
  - Providing external areas which can be used all year-round, adding value to the development and more
  - Importantly, acting in a positive way toward the creation of a community spirit and sense of ownership.
- 4.5.7 Key considerations during the landscape design process.
- Topography
  - Existing site features including mature tree and hedgerows
  - Aspect,
  - Wildlife and ecology,
  - Open space networks, connectivity and legibility (Making connections),
  - The development of landmarks, focal points and vistas,
  - Management post construction.
- 4.5.8 Second to the principal design for positive open space is the development of a palette of materials for both hard and soft landscaping; to both the amenity lands and the streetscape. To aid us during the process to select materials we developed a simple check list of both hard and soft landscape materials which is noted below.

4.5.9 Hard works materials must;

- Be of a high-quality material and finish,
- Allow for ease of movement for all users,
- Enhance the space and not conflict with the building materials,
- Work and look attractive in both wet and dry conditions,
- Be compliant with slip resistance standards,
- Have a long timeline appeal,
- Be robust allowing for minimum maintenance.

4.5.10 All selected materials must meet all seven points, and in doing will ensure a durable landscape public realm, with reduced maintenance.

4.5.11 Soft works plant materials were selected using the following;

- Plant suitability, plant selection in general shall:
- Be suitable for the Irish climate,
- Be non-invasive,
- Collectively provide visual interest all year round,
- Enhance biodiversity and habitat creation,
- Be disease resistant,
- Be cognisant of the local environment .

4.5.12 The use and mix of trees, shrubs and herbaceous plants have been considered in detail in order to be robust enough to establish and be easily maintained, while still offering seasonal interest, movement and a focused expression. Many of the herbaceous perennials have been under planted with bulb species to offer 'flurries' of colour from early to late spring. Leaf colour, bark colour and berries have all been considered for the scheme which allows for good contrast and seasonal variation.

4.5.13 In parallel to this, the development and enhancement of biodiversity and ecology have been considered through the retention of existing trees and hedgerows where possible, the inclusion of specie enriched meadows, infilling and new planting of native hedgerows and compensatory woodland blocks planted adjacent retained hedgerows.

### Whole Life Design

- 4.5.14 The landscape of site has been designed to cater for the needs and various age profiles of all residents. The open-minded nature of the design provided will not limit use of the open spaces because of age, gender or ability.
- 4.5.15 By approaching the overall landscape design using these design principals the scheme delivered will provide a high level of amenity, will be considered workable, aesthetically appealing and robust and designed to work both within the surrounding development. The selected plants and materials will have a long-life expectancy reducing maintenance and management costs.

## **4.6 Waste Management**

### Housing Units

- 4.6.1 Prior to commencement, a detailed Construction and Operational Waste Management Plan will be prepared.
- 4.6.2 Where possible, materials are selected to minimise on-going maintenance inputs. Domestic waste management strategy will be deployed allowing for Grey, Brown and Green bin distinction. Competitive tender process for waste management collection will be procured to achieve best quality and high value service. In mid-terrace units, bin storage units are provided in an enclosed structure to the front of the property. In the remaining units, which have access from a side or rear passage, bins will be stored in rear gardens. Organic waste bins to be provided throughout which helps reduce potential waste charges and helps to reduce the amount of waste being transferred to landfill.

### Apartment Units

- 4.6.3 Prior to commencement, a detailed Construction and Operational Waste Management Plan will be prepared.
- 4.6.4 Where possible, materials are selected to minimise on-going maintenance inputs. A centralised, covered and locked bin storage unit will be located adjacent to the apartment blocks. It will be easily accessible by all residents, will minimise potential littering of the scheme, and will reduce potential waste charges. Organic waste bins to be provided throughout which helps reduce potential waste charges and helps to reduce the amount of waste being transferred to landfill.

## 4.7 Human Health & Wellbeing

### Housing Units

- 4.7.1 The built environment has been designed in order to maximise the quality of life within the development, with the health and wellbeing of the user in mind. Generous open spaces surrounding the housing units have been defined and orientated for this purpose. Passive surveillance has been incorporated into the design. This reduces the risk of crime to all residents within the scheme, littering, and loitering of green spaces. The garden design of each unit in the scheme is integral to the health and wellbeing approach of the development, and has been maximised in specific units where possible.

### Apartment Units

- 4.7.2 The apartments have been designed with the health and wellbeing of the user in mind. The unit layouts have been devised with respect to equality with the provision of adequately sized bedrooms. The design team considered the quality of the shared living spaces and the importance of natural daylight by providing large glazed windows, and external balconies. In addition, all units will comply with the accessibility requirements of Part M / K, as included in the building regulations, and this results in a reduced level of adaption required, and associated costs, potentially necessitated by residents' future circumstances. The scheme is designed to incorporate passive surveillance of communal areas which reduces the risk of crime to all residents. This Demonstrates how the scheme has been designed to comply with best practice.

## 4.8 Residential Management

- 4.8.1 Handover packs and house rules will be provided to unit purchasers which will include information in relation to the unit they purchased, the building and the surrounding areas.
- 4.8.2 Handover packs typically include:
- information in relation to connections with utilities and communication providers
  - contact details for all relevant suppliers
  - instructions for the use of mechanical and electrical systems including heating and ventilation equipment
  - instructions for the use of appliances
  - contact details for the managing agent
  - emergency contact details
  - information on public transport links
- 4.8.3 House rules typically include:
- Refuse arrangements

- Noise constraints
- Alarm systems
- Bicycle storage
- Pet policy
- Balcony policy
- Satellite dishes
- Car parking

## 4.9 Energy & Carbon Emissions

4.9.1 This section sets out various energy conservation measures which are proposed in order to reduce costs for future residents of the scheme.

4.9.2 The proposed development will comply with Part L 2019 (NZEB). As part of the development's efforts to further reduce energy consumption, the project is targeting an A2 BER (Building Energy Rating) throughout. Extensive work has been carried out to develop a balanced design approach to achieve these onerous targets with a number of sustainable features being incorporated into the design from the early stages.

### Near Zero Energy Building Standard (NZEB)

4.9.3 Technical Guidance Document Part L – Conservation of Fuel and Energy – Dwellings sets out the requirements for the minimum fabric and air permeability requirements, maximum primary energy use and carbon dioxide (CO<sub>2</sub>) emissions as well as the minimum amount of energy derived from renewable sources, as calculated using the Domestic Energy Assessment Procedure (DEAP) methodology. The compliance with the requirements of this document is compulsory for all new dwellings.

4.9.4 The current edition of the Building regulations "TGD-L 2019" was published in July 2019 and sets out the design requirements for Nearly Zero Energy Buildings (NZEB). In accordance with the requirements of The European Energy Performance of Buildings Directive Recast (EPBD) all new buildings must achieve the Nearly Zero Energy Building (NZEB) standard by 1<sup>st</sup> November 2019.

4.9.5 As a result of the analysis carried out on the proposed development, it can be concluded that, all units within the proposed development are shown to achieve Part L (2019) compliance with respect to MPEPC and MPCPC values for both energy and carbon performance requirements. As a result of this, overall NZEB compliance can be shown throughout the proposed development.

### Detailed Design

4.9.6 The dwellings shall include a number of energy conservation measures to achieve a high energy rating for each property:

- High-performance thermal envelope with low U-values for the fabric,

- Airtight construction,
- Ventilation system,
- Heat Pump (HP) Technology and or Photo-Voltaic (PV) Panels,
- Energy efficient lighting to be used throughout.

4.9.7 The sustainable design of the proposed development ensures that each unit in the development performs efficiently and complies with the upcoming NZEB criteria. The sections below outline the elements (based on passive and active measures) that aid in the reduction of energy consumption, carbon emissions and cost throughout the building lifecycle. The table also provides information to be used in the DEAP assessment for each specific unit in the development:

#### High Performance Construction Fabric

4.9.8 The construction U-values for each dwelling within the development is outlined in the building regulations Technical Guidance Document – Part L (2019).

Building Fabric Element	TGD-L 2019 / NZEB
	U-value (W/m <sup>2</sup> K)
- Pitched Roof	0.16
- Flat Roof	0.20
- External Walls	0.18
- Ground Floor / Exposed Floor	0.18
- External doors, Windows, Rooflights	1.40
- Air Permeability (Air Tightness)	5.0 m <sup>3</sup> /h m <sup>2</sup> @ 50Pa

4.9.9 High-performance building fabric elements are being considered and selected in order to minimise unnecessary heat loss from the internal spaces.

4.9.10 In addition to the reduction in energy consumption and associated carbon emissions for space heating and ventilation through a high performance fabric, high efficiency heating systems are being proposed for use throughout the development, minimising heat losses through the buildings fabric as well as a lower than required air permeability rate, helps to ensure lower energy consumption rates and associated carbon emissions are achieved throughout the year thus reducing the overall cost of heating for the end user.

#### Air Tightness Construction

4.9.11 The building will be designed to ensure it will achieve compliance and also exceed the air tightness requirements outlined in the Part L (2019) TGD document.

4.9.12 The current proposal for air tightness in the Part L document is set to a maximum value of 5.0 m<sup>3</sup>/hr/m<sup>2</sup> @50Pa.

### Thermal Bridging

- 4.9.13 The limitation of thermal bridging will be achieved in accordance with guidance outlined in the Technical Guidance Document Part L (2019) regulations.
- 4.9.14 To account for thermal bridging performance from Part L (2019), this should be achieved by adherence to the BR Part L 2011 Acceptable Construction Details and monitoring during the construction.

### HVAC systems

#### *Ventilation System*

- 4.9.15 There are three options currently being analysed for use within the development. The solution will be confirmed in the detailed design.
- i) The first system is Natural Ventilation + Intermittent Extract Fans
  - ii) The second option is the introduction of a 'whole house extract ventilation system' (MEV), which like option 1, operates by extracting warm, stale air from dwelling wetrooms either centrally or decentralised.
  - iii) The third option is a whole dwelling approach with 'mechanical ventilation with heat recovery system' (MVHR). The unit works by extracting warm, stale air from 'wetrooms' (kitchen, utility, bathroom, etc.), and extracting the embodied energy (heat) from this exhaust air and re-introducing this captured energy into the incoming fresh air.

#### *Heating system*

- 4.9.16 Individual Air Source Heat Pump or Exhaust Air Heat Pump will be installed in each dwelling subject to detailed design. The dwelling shall be heated by means of either underfloor heating or low temperature radiators / fan coil units. In addition, electrical radiant panel heaters shall be considered during the detailed design.
- 4.9.17 Modern heat pumps will typically provide 4 to 5 times more heat energy to the dwelling than the electrical energy they consume. They have a lower consumption of energy and therefore lower carbon emissions.

### Renewable Technologies (heat pumps and PV)

- 4.9.18 In order to comply with building regulations, 20% of the primary energy delivered to a dwelling (i.e. apartment) must be achieved through the use of renewable energy technologies. Both CHP and EAHP systems are classified as renewable technologies under Part L (2019).

Element	TGD-L 2019 / NZEB
Maximum Permitted Energy Performance Coefficient (MPEPC)	0.300
Maximum Permitted Carbon Performance Coefficient (MPCPC)	0.350

Renewables	TGD-L 2019 / NZEB
Minimum Amount of Energy from Renewable Sources	20%

- 4.9.19 As a result, the inclusion of solar PV panels shall be analysed in the detailed design in order to ensure that the required renewable energy targets can be achieved within the proposed development.

#### Lighting

- 4.9.20 Provision for natural daylight in modern buildings helps to create a better internal environment for occupants and helping to assist in the well-being of the inhabitants.
- 4.9.21 All light fittings are to be based on LED type (A+ Rated bulb) located throughout each occupiable space, such as bedroom, lobby, living/dining etc. A significant reduction in electrical energy usage may therefore be achievable through the use of high efficiency lights.

#### Water Conservation Measures

- 4.9.22 The requirements for Low flow sanitary ware (circa 6 ltrs/min) in each dwelling shall be considered in the detailed design. This is a water conservation initiative and reduces waste by restricting water flowrates to a shower within the dwelling. The shower head fittings could be provided with a reduced flow to allow for the conservation of water use as well as reducing energy used to heat hot water.

### **4.10 Transport and Accessibility**

- 4.10.1 The subject site will be highly accessible to pedestrians and cyclists from the adjacent Stoney Hill Road. The proposed development achieves filtered permeability, primarily for walking and cycling at three locations along Stoney Hill Road:
- There is a pedestrian/cycle only access provided to the north of the site which leads to unit numbers 131-135, and subsequently Access Road 4 and the apartment block.
  - At the apartment block access junction, pedestrians are provided with dedicated footways along both sides of the access route.

- At the southern site access junction, pedestrians are provided with a dedicated footway along the northern side of the access route. In addition along the southern side of the route, there is a pedestrian access which connects with the linear path which travels along the southern extents of the site.
- 4.10.2 The arrangement at the two site access junctions includes the provision of uncontrolled crossing points with associated tactile paving and dropped kerbs to allow pedestrians and cyclists to continue their journey along Stoney Hill Road. Whilst the arrangement at the crèche site access junction includes the provision of uncontrolled crossing points with associated tactile paving and dropped kerbs to allow pedestrians to continue their journey along the Peyton access road.
- 4.10.3 The internal pedestrian routes within the site were derived from the location of the apartment block, residential dwellings and associated facilities. This has led to the creation of pedestrian routes that lead to/from and around the development and ties into the existing pedestrian facilities along Stoney Hill Road.
- 4.10.4 Pedestrians are given priority within the internal site layout to ensure desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict with vehicles is minimised.
- 4.10.5 The alignment and layout of the pedestrian routes along Access Roads 1&4 can facilitate future extension to enable pedestrian access to the SDCC RES-N zoned lands at a later date.
- 4.10.6 The houses and duplex units benefit from the provision of rear / side accesses therefore these residents can park/ store their bicycles within their own property boundary.
- 4.10.7 The proposed development provides 99 bicycle parking spaces for the apartment block and 20 bicycle parking spaces for the creche facility (119 in total).

#### Public Transport

- 4.10.8 The site is situated approximately 550m from the nearest bus stop to the north of the site. These bus stops are served by Dublin Bus Routes 69 and 69X with the 69 bus having a service every hour from Monday to Saturday.
- 4.10.9 The closest railway station to the site is Hazelhatch and Celbridge, located 8.5km to the north of the development. It provides services east to Dublin Heuston and Dublin Grand Canal Dock; westwards to Portlaoise and southwards to Waterford
- 4.10.10 The Dublin Luas is accessible approximately 3.3 km east of the site, which is within a comfortable cycling distance. The Saggart LUAS stop is a terminal stop for the red line and provides high frequency services into Dublin City Centre, at a very high average daytime frequency of one every 6 to 7 minutes.

### Mobility Management

- 4.10.11 As part of the Traffic and Transport Assessment, a chapter detailing an outline Mobility Management Plan has also been included. Upon completion of the development, when the scheme is occupied, it is recommended an updated Mobility Management Plan is undertaken in unison with travel surveys for residents, staff and visitors, which will inform travel targets for site users.

## 5 CONCLUSION

- 5.1 This Building Lifecycle Report provides significant and relevant detail in relation to the building lifecycle of the proposed development, in compliance with the requirements of Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (March 2018).
- 5.2 As demonstrated in this report, the proposed development will be constructed to high building standards and will provide a sustainable, energy efficient development for future occupants.