

Henry J Lyons

Life Cycle Report  
Spencer Place City Block 2

August 2019





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## 0.0 INTRODUCTION

# INTRODUCTION

The Sustainable Urban Housing; Design Standards for New Apartments - Guidelines for Planning Authorities were published in March 2018 (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*'.

Section 6.13 of the Apartment Guidelines requires that apartment applications :

*'include a building life cycle 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 sets out to address the requirements of Section 6.13 of the Apartment Guidelines. The report is broken into two sections as follows:

Section 1: An assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application

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

This report has been prepared by the following consultants on behalf of Spencer Place Development Company Limited:

- Henry J Lyons
- Cronin & Sutton Consulting Engineers
- Axiseng Consulting Engineers
- John Spain Associates
- Niall Montgomery & Partners

# PROPOSED DEVELOPMENT

Spencer Place Development Company Limited seeks amendments to the previously permitted development permitted under Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at a site of 1.26 hectares located at City Block 2, Spencer Dock, Dublin 1. The site is bound by Sheriff Street Upper to the north, Mayor Street Upper to the south, New Wapping Street to the east and a development site to the west (also part of Block 2). The development site also includes the existing operational North Lotts Pumping Station and its associated infrastructure

The application relates to a proposed development within a Strategic Development Zone Planning Scheme area.

The proposed development comprises of amendments to previously permitted development DSDZ4279/18 incorporating:

- The reconfiguration of the permitted residential scheme to provides for an additional 122 no. units increasing the total number of residential units from 349 to 464 no. The total breakdown of units will comprise of 229 no. 1 bed and 235 no. 2 bed units (18no. 2 bed 3 person and 217no. 2 bed 4 person) with ancillary residential amenity spaces.
- A revision of the building heights and design articulation throughout sees the height of Block 1 increase from 7 no. storeys (27.5m) to part 10 no. part 13 no. storeys (46.8m) and the height of Block 2 increase from part 3 no. storeys / part 7 no. storeys (27.5m) to a range of 3 no. storeys to 10 no. storeys (40.5m)

- Block 1 will comprise of 298 no. units (141 no. 1 beds and 157 no. 2 beds)

- Block 2 will comprise of 119 no. units (56 no. 1 beds and 63 no. 2 beds), and also include the provision for a shared accommodation layout to provide 200 no. bedspaces in lieu of a previous aparthotel layout,

- The revised block layout will result in amendments to all elevations including location and materiality of private balconies / terraces and revised resident amenity facilities;

- Revised undercroft layout to include an increase in car parking spaces from 77 no. car parking spaces to 78 no. car parking and increase in bicycle parking from 462 no. spaces to 726 no. spaces;

- Revised landscaping and boundary treatment;

- Revisions to plant at roof level;

- The development also includes, SUDs drainage, the provision of a green roof on both blocks and all associated site development works necessary to facilitate the development.



CGI of Proposal



CGI of Proposal





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## 1.0 SECTION 1

# PROPERTY MANAGEMENT OF COMMON AREAS

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 are kept within the agreed annual operational budget.

The property management company will enter into a contract directly with the Owner 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 PRSA.

The property management company also has the following responsibilities for the apartment development once constructed:

- Timely formation of an Owners Management Company (OMC) - which will be a company limited by guarantee having no share capital. All future purchasers will be obliged to become members of this OMC.
- Preparation of annual service charge budget for the development's common areas.
- Fair and equitable apportionment of the annual operational charges in line with the MUD Act 2011.
- 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 common areas.
- Transfer of documentation in line with Schedule 3 of MUD Act 2011.
- Estate Management
- Third Party Contractors Procurement & Management.
- OMC Reporting
- Accounting & Corporate Services
- Insurance Management
- After Hours Services
- Staff Administration

# 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, lift, life safety systems, security, property management fee etc., to the development common areas in accordance with 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. The BIF report will identify those works which are necessary to maintain, repair, and enhance the premises over the 30 year life cycle, as required by the MUD Act 2011.

In line with 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.

*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.*

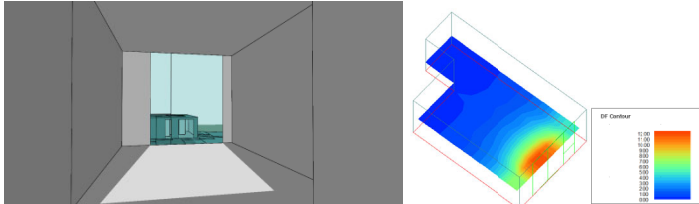


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## 2.0 SECTION 2

# ENERGY & CARBON EMISSIONS

Measures	Description	Outcome																																																																																																
<p><b>High Performance Construction Fabric</b></p>	<p>The construction u-values are being considered and design to meet or are lower than those required by Building Regulation Technical Guidance Documents Part L for Dwelling and Buildings other than Dwellings applied to residential and non-residential building block identified in Spencer North Block.</p> <p>See below Table 1 list U-value set out for building:</p> <table border="1" data-bbox="284 510 1026 792"> <thead> <tr> <th colspan="3">Non-residential Building</th> <th colspan="3">Residential Building</th> </tr> <tr> <th colspan="3">Table 1 Maximum elemental U-value<sup>1</sup> (W/m<sup>2</sup>K)</th> <th colspan="3">Table 1 Maximum elemental U-value (W/m<sup>2</sup>K)<sup>1,2</sup></th> </tr> <tr> <th>Column 1 Fabric Elements</th> <th>Column 2 Area – weighted Average Elemental U-Value (U<sub>e</sub>)</th> <th>Column 3 Average Elemental U-value Individual element or section of element</th> <th>Column 1 Fabric Elements</th> <th>Column 2 Area-weighted Average Elemental U-Value (U<sub>e</sub>)</th> <th>Column 3 Average Elemental U-value – Individual element or section of element</th> </tr> </thead> <tbody> <tr> <td>Roofs<sup>1</sup></td> <td></td> <td></td> <td>Roofs</td> <td></td> <td></td> </tr> <tr> <td>Pitched roof</td> <td></td> <td></td> <td>Pitched roof</td> <td></td> <td></td> </tr> <tr> <td>- Insulation at ceiling</td> <td>0.16</td> <td></td> <td>- Insulation at ceiling</td> <td>0.16</td> <td>0.3</td> </tr> <tr> <td>- Insulation on slope</td> <td>0.16</td> <td>0.3</td> <td>- Insulation on slope</td> <td>0.16</td> <td></td> </tr> <tr> <td>Flat roof</td> <td>0.20</td> <td></td> <td>Flat roof</td> <td>0.20</td> <td></td> </tr> <tr> <td>Walls<sup>1</sup></td> <td>0.21</td> <td>0.6</td> <td>Walls</td> <td>.21</td> <td>0.6</td> </tr> <tr> <td>Ground Floors<sup>1,2</sup></td> <td>0.21</td> <td>0.6</td> <td>Ground floors<sup>1</sup></td> <td>.21</td> <td>0.6</td> </tr> <tr> <td>Other exposed floors<sup>2</sup></td> <td>0.21</td> <td>0.6</td> <td>Other exposed floors</td> <td>.21</td> <td>0.6</td> </tr> <tr> <td>External personnel doors, windows and rooflights<sup>1</sup></td> <td>1.6<sup>2</sup></td> <td>3.0</td> <td>External doors, windows and rooflights</td> <td>1.6</td> <td>3.0</td> </tr> <tr> <td>Curtain Walling</td> <td>1.6</td> <td>3.0</td> <td>Curtain Walling</td> <td>1.6</td> <td>3.0</td> </tr> <tr> <td>Vehicle access and similar large doors</td> <td>1.5</td> <td>3.0</td> <td>Vehicle access and similar large doors</td> <td>1.5</td> <td>3.0</td> </tr> <tr> <td>High usage entrance door<sup>1</sup></td> <td>3.0</td> <td>3.0</td> <td>High usage entrance door</td> <td>3.0</td> <td>3.0</td> </tr> <tr> <td>Swimming Pool Basin<sup>1</sup></td> <td>0.25</td> <td>0.6</td> <td>Swimming Pool Basin</td> <td>0.25</td> <td>0.6</td> </tr> </tbody> </table> <p>The U-value requirement set out for dwelling building set out in the building regulation 2018 technical guidance Document L is still under public consultation and is lower than U-values requirement set out in the building regulation 2017.</p> <p>A number of passive solar design has been considered including the window design option to maximising daylight and solar heat gains during winter to reduce the artificial lighting and space heating load, whilst minimising summer gains to reduce the cooling load.</p> <p>The high-performance wall, roof and glazing is being considered and selected to minimise the heat transfer into the internal spaces. Aside from the reduction in heating and cooling energy consumption and carbon emissions, the reduction in loads results in reduced central plant capacity and size. This has the net effect of reducing embodied energy consumption associated with manufacture and transportation associated with the plant, as well as the reduced input from the national electricity grid (for cooling), and natural gas (for heating).</p>	Non-residential Building			Residential Building			Table 1 Maximum elemental U-value <sup>1</sup> (W/m <sup>2</sup> K)			Table 1 Maximum elemental U-value (W/m <sup>2</sup> K) <sup>1,2</sup>			Column 1 Fabric Elements	Column 2 Area – weighted Average Elemental U-Value (U <sub>e</sub> )	Column 3 Average Elemental U-value Individual element or section of element	Column 1 Fabric Elements	Column 2 Area-weighted Average Elemental U-Value (U <sub>e</sub> )	Column 3 Average Elemental U-value – Individual element or section of element	Roofs <sup>1</sup>			Roofs			Pitched roof			Pitched roof			- Insulation at ceiling	0.16		- Insulation at ceiling	0.16	0.3	- Insulation on slope	0.16	0.3	- Insulation on slope	0.16		Flat roof	0.20		Flat roof	0.20		Walls <sup>1</sup>	0.21	0.6	Walls	.21	0.6	Ground Floors <sup>1,2</sup>	0.21	0.6	Ground floors <sup>1</sup>	.21	0.6	Other exposed floors <sup>2</sup>	0.21	0.6	Other exposed floors	.21	0.6	External personnel doors, windows and rooflights <sup>1</sup>	1.6 <sup>2</sup>	3.0	External doors, windows and rooflights	1.6	3.0	Curtain Walling	1.6	3.0	Curtain Walling	1.6	3.0	Vehicle access and similar large doors	1.5	3.0	Vehicle access and similar large doors	1.5	3.0	High usage entrance door <sup>1</sup>	3.0	3.0	High usage entrance door	3.0	3.0	Swimming Pool Basin <sup>1</sup>	0.25	0.6	Swimming Pool Basin	0.25	0.6	<p>Minimise heat losses through the building fabric thus lowering energy consumption and carbon emission</p> <p>Minimise heat loss and gain impact on heating and cooling load requirement all-time during year, thus lowering energy and carbon footprint impact.</p>
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<p><b>Air Tightness Construction</b></p>	<p>Airtightness construction, the building will be designed to ensure it is in compliant with the building regulation and achieving air tightness of 3.0 m<sup>3</sup>/(h.m<sup>2</sup>). It is technically feasible to reduce the air permeability between 2.5 to 1.5 m<sup>3</sup>/(h.m<sup>2</sup>), this can be achieved if the on-site inspection and quality control is in place to ensure the design intention is achieve in the place.</p>	<p>Minimise heat losses through the building fabric thus lowering energy consumption and carbon emission.</p>																																																																																																
<p><b>Thermal Bridging</b></p>	<p>The limitation of thermal bridging will be achieved in according with guidance under section 1.3 within technical guidance Part L regulation. See below Table C2 on thermal</p> <table border="1" data-bbox="284 1787 791 1928"> <thead> <tr> <th>Junction Type of junction</th> <th>W/mK Involving metal cladding</th> <th>W/mK Not involving metal-cladding</th> </tr> </thead> <tbody> <tr> <td>Roof to wall</td> <td>0.28</td> <td>0.12</td> </tr> <tr> <td>Wall to ground floor</td> <td>1.0</td> <td>0.16</td> </tr> <tr> <td>Wall to wall (corner)</td> <td>0.2</td> <td>0.09</td> </tr> <tr> <td>Wall to floor (not ground floor)</td> <td>0.0</td> <td>0.07</td> </tr> <tr> <td>Lintel above window or door</td> <td>1.0</td> <td>0.30</td> </tr> <tr> <td>Sill below window</td> <td>0.95</td> <td>0.04</td> </tr> <tr> <td>Jamb at window or door</td> <td>0.95</td> <td>0.05</td> </tr> </tbody> </table> <p>On-site inspection and quality control will be carried to ensure continuity of insulation and to limit local thermal bridging at junction between construction element and other locations e.g. around windows, door and other wall openings.</p>	Junction Type of junction	W/mK Involving metal cladding	W/mK Not involving metal-cladding	Roof to wall	0.28	0.12	Wall to ground floor	1.0	0.16	Wall to wall (corner)	0.2	0.09	Wall to floor (not ground floor)	0.0	0.07	Lintel above window or door	1.0	0.30	Sill below window	0.95	0.04	Jamb at window or door	0.95	0.05	<p>Minimise heat losses at junctions between construction element, thus lowering energy consumption and carbon emission</p>																																																																								
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<b>Daylight &amp; Lighting</b>	<p>Provision of natural daylight in buildings creates a positive environment by providing connectivity with the outside world, and assisting in the well-being of the building inhabitants. Daylight also represents an energy source - reducing the reliance on artificial lighting. The provision of full-height glazing on the elevations maximise the use of natural daylight to enhance visual comfort, without compromising thermal performance.</p>  <p><i>Figure: Daylight modelling &amp; daylight factor result taken from radiance toolkit, IESVE software</i></p> <p>Majority of lamps selection will be based LED type located externally, and internally in circulation spaces, bedroom, lobby, basement car-park, cores and reception. LED technology results in 30-35% reduction in electrical energy usage. Expected lamp life is 50,000-hours, compared to T5 lamps that require replacement and disposal (WEEE Directive 2006) after 12,000-hours.</p> <p>Automatic daylight lighting control (automatic dimming) complete with combined PIR detection. Intelligent lighting controls in reception/Cafe allow electrical energy savings of up to 40%, as well as increasing the occupant exposure to natural daylight - thereby promoting a healthier work environment.</p>	<p>Reducing lighting electricity energy consumption, thus reducing carbon emission footprint overall.</p> <p>Enhance healthier working and leisure environment through the use of natural daylight</p> <p>Minimise the personnel resource and time in controlling the lighting system, thus reducing cost.</p>
<b>HVAC system</b>	<p><b>Exhaust Air Heat Pump</b></p> <p>Exhaust Air Heat Pump in residential units will provide ventilation, heating and hot water to the apartment. Exhaust air heat pump is an energy recycling system, where it collects energy from warm inside air via the ventilation system and re-use it to heat up fresh air incoming and tap water and reduce electricity consumption by 50%.</p>	<p>The lower capital cost in comparison to central plant installation. Heat pump provides 4 to 5 times more heat energy than the electricity consumed, comparing to other heat generator types. Lower energy and running cost.</p>
	<p><b>Hot Water appliances – Flow restrictor</b></p> <p>All hot water taps including the shower head fitting in the residential apartment are to be fitted with intelligent water flow regulators to all for full water flow until the discharge rate reaches six litres per minute, to allow for the conservation of water uses well as energy used to heat hot water.</p>	<p>Minimise hot water usage, thus reducing heating energy load and increasing heat pump operating performance and reducing the cost.</p>
	<p><b>Heat Recovery in centralised mechanical ventilation system</b></p>	

	<p>The inclusion of heat recovery unit into the centralised ventilation system allows for heat transfer between exhaust and supply air before the heating and cooling coils thus reducing heating and cooling load.</p>	<p>Reduction in energy consumption and carbon emission.</p>
	<p><b>Multi-purpose Chiller</b></p> <p>The Shared Accommodation block will be provided with a roof-mounted chiller that will provide heating and cooling medium to serve a central low hot water and chiller water before the Fan Coil Units. Heat pump technology is embedded inside the unit allow for heat rejection to be recover and reuse for heating and DHW, thus contributing to energy saving and carbon emission reduction.</p>	<p>Small footprint plant space. Heating output recovery to be reusable. Eliminate the need of boilers and its capital cost.</p>
	<p><b>Gas Absorption Heat Pumps</b></p> <p>The Co-living block will be with a gas absorption heat pump that will provide heating to service hot water load. The gas absorption heat pump delivery a high level of fuel efficiency during operation comparing to a typical heating boiler.</p>	<p>Low carbon and integrated renewable energy system with Multi-purpose unit (heat pump). High efficiencies, lowering energy consumption and carbon emission.</p>
	<p><b>District Heating</b></p> <p>Heating systems have been designed to facilitate integration of a future District Heating (DH) system. The design philosophy includes the following provisions for future connections:</p> <ul style="list-style-type: none"> <li>- Space allocations for future heat exchanging plant.</li> <li>- Centralised primary/secondary heating systems with low loss headers to facilitate integration of DH services.</li> <li>- Incoming pipework installed through the basement box wall to facilitate ease of future connection and to eliminate future builder's work.</li> <li>- Space allocation provision in service risers for future heating pipework.</li> </ul> <p>District heating offers many benefits and real cost-saving advantages. It will allow users to decide when, where and how much energy they need, ensuing maximum comfort, whilst providing hot water on demand.</p>	<p>A future district heating system comes from a sustainable and efficient process and eliminates any carbon emissions produced on site for heating.</p>
<p><b>Building Energy Management System</b></p>	<p>Central BMS – check metering (heating/cooling/power) of all individual floors and wings to monitor &amp; optimise substantive energy use. The energy management system will continuously review and fine-tune the operational efficiencies and strategy for the various building services, significantly reducing clients' overall energy consumption and carbon footprint, and reducing energy costs by up to 25%</p>	<p>Continuously energy monitoring allows for further energy saving quantified through building lifecycle thus lowering overall cost and carbon footprint.</p>



# MATERIALS

Action	Commentary	Benefits
	<p>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 of buildings and their parts.</p> <p>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:</p> <ul style="list-style-type: none"> <li>• Annex A – Climatic Agents affecting durability</li> <li>• Annex B – Guidance on materials and durability</li> <li>• Annex C – Examples of material or component failures</li> <li>• Annex D – Design Life data sheets</li> </ul>	<p>Ensures the long term durability and maintenance of materials is an integral part of the design and specification of the proposed development.</p>
<b>Cladding Materials</b>	<p>Use of brickwork, glazed balconies and solid metal panels are used throughout. Metalwork is to have marine grade PPC finish.</p>	<p>Choosing robust materials reduces ongoing maintenance and repairs.</p>
<b>Windows</b>	<p>Use of factory finished alu clad windows and doors</p>	<p>Requires no ongoing maintenance.</p>

# LANDSCAPE

Action	Commentary	Benefits
<b>Site Layout &amp; Design</b>	Generous and high quality landscaped courtyards have been designed within the proposed development. This includes street tree planting and soft and hard landscaping within the courtyards and the new east west pedestrian street.	An improved environment and access to natural elements within the development.
<b>Green Roofs</b>	Use of green roofs throughout the development	Attenuation provided by the green roof reduces the burden on rainwater goods, resulting in fewer elements that could require repair.
<b>Materials</b>	Use of robust materials with high slip resistance to be used for paving. Durable and robust equipment to be used throughout.	Robust materials and elements reduce the frequency of required repair and maintenance.

# MANAGEMENT

Measure	Description	Benefits
<b>Home User Guide</b>	<p>Once a purchaser completes their sale, a homeowner box will be provided which will include:</p> <p><b>Homeowner Manual</b> – This will provide important information for the purchases 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.</p> <p><b>A Residents Pack</b> – This is 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 the rules and regulations.</p>	Residents are as informed as possible so that any issues can be addressed in a timely and efficient manner.

# HEALTH & WELL BEING

Action	Commentary	Benefits
<b>Daylight &amp; Sunlight</b>	The design, separation distances and layout of the apartment blocks have been designed to optimise the ingress of natural daylight & sunlight to the proposed apartments to provide good levels of natural light.	Reduces the reliance on artificial lighting thereby reducing running costs.
<b>Accessibility</b>	All units will comply with the requirements of Part M and Part K.	Reduces the level of adaption and associated costs potentially necessitated by residents future circumstances.
<b>Security</b>	<p>The scheme is designed to incorporate natural surveillance wherever possible and supplemented by the following strategies:</p> <ul style="list-style-type: none"> <li>• CCTV monitoring</li> <li>• Access control to lower ground car park</li> <li>• Secure bicycle stands covered by CCTV</li> <li>• Routine access fob audits</li> </ul>	Help to reduce potential security & management costs.
<b>Natural Amenity</b>	Communal open spaces at the centre of both blocks	Facilitates community interaction, socialising and play resulting in improved well being.
<b>Central Location</b>	The site is located in a very central location with good access to public transport, parks and public spaces	Encourages interaction with the city and the outdoors to promote a healthy lifestyle.

# WASTE MANAGEMENT

As part of the parent application (Reg. Ref. DSDZ4279/18), a Waste Management Statement for Construction & Operation was submitted by the Developer. This document illustrates how, at all times, industry best practises will be employed during the life cycle of the Development.

Mitigation measures proposed during the Construction phase include: -

1. On-site segregation of all waste materials into appropriate categories including:
  - made ground, soil, subsoil, bedrock
  - concrete, bricks, tiles, ceramics, plasterboard
  - metals
  - dry recyclables e.g. cardboard, plastic, timber
2. All waste materials will be stored in skips or other suitable receptacles in a designated area of the site.
3. Wherever possible, left over materials (e.g. timber off cuts) and any suitable demolition materials shall be re-used on-site.
4. Any potentially contaminated soil to be removed from site will be tested to confirm its contamination status and subsequent management requirements.
5. All waste leaving site will be recycled, recovered or reused where possible, with the exception of those waste streams where appropriate facilities are currently not available.
6. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably licensed or permitted facilities.
7. All waste leaving the site will be recorded and copies of relevant documentation maintained.

During the operational phase, In order to minimise the disposal of waste material to landfill, the mantra of “reduce, reuse, recycle” will be promoted throughout the development. In addition, the following mitigation measures will be employed;

1. Suitable waste materials will be stored in bins or other receptacles in designated, easily accessible locations.
2. Waste leaving the site will be transported by suitable permitted contractors and taken to suitably permitted/licensed facilities.
3. Where necessary, waste leaving the site will be recorded and copies of relevant documentation maintained.
4. Where necessary, waste from the development will be segregated and stored in designated centralised waste storage areas in the basement.
5. These mitigation measures will ensure the waste arising from the Development is dealt with in compliance with the provisions of the Waste Management Act 1996 (as amended 2001), and associated Regulations, the Litter Act of 1997 and the Dublin Waste Management Plan (2005 - 2010), and achieve optimum levels of waste reduction, re-use and recycling.

# TRANSPORT

Action	Commentary	Benefits
<b>Access to Public Transport (LUAS/ Light Rail)</b>	The Spencer Dock LUAS stop is located immediately adjacent to the proposed 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.
<b>Access to Public Transport (Bus Services &amp; Rail Services)</b>	<p>A number of bus stops are located within a 5-minute walk of the subject site. These stops collectively are served by 7no. Dublin Bus routes.</p> <p>The subject site is located approx. 200m east of the Docklands railway station. Services from this station operate towards Sligo, serving commuter towns in Meath and Kildare. Pearse Street railway station is approx. 1km to the southwest of the subject site; Connolly Railway station, to which the subject site is connected by the LUAS light rail line, is approx. 900m to the west. Intercity rail services from these stations operate towards Belfast, Sligo and Rosslare, serving commuter towns in counties Dublin, Meath, Louth, Kildare, Wicklow and Wexford. Frequent DART rail services also operate via these stations, between Malahide/Howth in the north and Greystones in the south. A limited number of commuter rail services also operate from these stations to Newbridge in southern Kildare, via the newly reopened Phoenix Park rail tunnel.</p>	These bus services provide access to a range of additional destinations above that serviced by the LUAS 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.
<b>Permeable Connections</b>	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.
<b>Bicycle Storage</b>	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.
<b>Motorcycle Parking</b>	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.
<b>Car Sharing</b>	The scheme will include designated car club spaces for exclusive use of the residents.	Reduces the reliance on the private motor vehicle and reducing oil dependency.





