Planning Stage - Sustainability Report

For the

Mechanical & Electrical Services Installations

At

Spencer Place North Development
Dublin 1

For

Spencer Place Development Company Limited

08/08/2019 Rev: 4

Document History

Revision No.	Description	Prepared By	Reviewed By	Date
Rev 0	Planning Stage - Sustainability Report	AOD	KW	08/10/2018
1	Planning Stage	KW	KW	25/10/2018
2	Planning Stage	AOD	KW	08/02/2019
3	Planning Stage	RW	AOD	29/07/2019
4	Planning Stage	RW	AOD	08/08/2019

Contents

1. Introduction

The proposed development, located at Spencer Place North, Spencer Dock, Dublin 1 includes a combined shared accommodation and residential development.

The site is bound by Sheriff Street Upper to the North, Mayor Street to the South, New Wapping Street to the East and a development site to the West.

The application site is currently under construction for planning application reference Reg. Ref. 2896/18 as amended by Re. REF DSDZ42479/18 for 349 no. residential units and an aparthotel scheme (102 no. units) over basement level. The development under construction has not been subject to an EIAR as it did not exceed the threshold as set out in schedule 5. The proposed development seeks alterations to this development currently under construction to provide for 464 no. residential apartment units and 200 no. shared accommodation bed spaces. The proposed footprint of the building and basement excavation remains the as per the permitted development on the site. Site utility services have been designed as per drawing no. SPN3-AXE-ZZ-ZZ-DR-E-60101.

It should be noted that the proposed development does not exceed the 500 no. units threshold for residential development, however considering the combination of both the shared accommodation (102 no. units) and the apartment units (464 no.).

The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

Each Block has an under-croft basement car park.

2. Overview

This report will demonstrate that the design philosophy for the proposed Spencer Place North Development will employ a holistic approach to the construction and integration of the buildings, their systems and users. This philosophy is supported by the use of sustainable options and energy efficient systems.

With consideration to the EU energy performance of Buildings Directive (EPBD), the Building Regulations Technical Guidance Document, Part L, current edition, and Dublin City Council's strategy for sustainable urban design and reductions in energy and carbon emissions, the building services design strategy for the Spencer Place North Development, Spencer Dock, Dublin 1 is to utilise as many sustainable design options and energy efficient systems that are technically, environmentally and economically feasible for the project to achieve a suitably sustainable status.

The design team recognises the need for the Development to be designed and operated in a manner that reduces its environmental impact.

The approach to sustainable design and energy efficiency will lead to the development being able to take advantage of efficient mechanical and electrical design solutions, complimented with the improvement of building construction elements to reduce the requirements for energy.

The sustainability strategy for the residential block has been derived using an IES assessment to comply with and surpass Technical Guidance Document (TGD), Part L, 2017.

The following design measures have been implemented to obtain a minimum pre-construction A2 BER rating for all residential units:

- Extract air source heat pumps
- High efficiency LED lighting
- Regenerative lift motors
- Low water usage (low flow fittings)
- Building management software
- Building fabric U-values meeting and where possible exceeding Building Regulations

The following design measures have been implemented to obtain a minimum pre-construction A3 BER rating for the shared accommodation development:

- Multi-purpose chiller for heating and cooling
- High efficiency LED lighting
- Regenerative lift motors
- Low water usage (low flow fittings)
- Building management software
- Building fabric U-values meeting and where possible exceeding Building Regulation

The reduction of fabric losses from the buildings will be achieved by using material with U-values which are in line with or lower than those required by Building Regulations, demonstrating the energy efficient approach being adopted.

Active and sustainable measures have been considered to ensure minimal energy requirements, robust design, optimal operation and minimal life cycle costs are achieved.

The active energy measures considered, include the following technologies:

1. Exhaust air source heat pump will be used for heating and hot water generation for all residential units. This system will recycle the heat from the ventilation system. This uses air drawn through ducts to the heat pump from the bathrooms, utility and kitchen areas. The colder 'waste' air is then discharged to the atmosphere through a separate duct. This intake and discharge system is used to inject heat into a refrigeration system (heat pump) which in turn provides heat to the space via radiators. This system also provides the ventilation required within the unit.

2. Centralised multi-purpose chiller for heating and cooling generation serving Fan Coil Units (FCUs) in each of the shared accommodation units. The chiller will be located at roof level with the redesigned option to locate the plant in the basement. This space allocation has been allowed for within the Planning General Arrangements from the Architect, in response to Planning Condition 6.

3. Central extract system to serve all shared accommodation ensuites, supplemented with local supply air fan complete with heater battery for each unit.

4. Heating systems have been designed to facilitate integration of a District Heating (DH) system. The design philosophy includes the following provisions to comply with Planning Condition 23:
   - Space allocations for future heat exchanging plant
   - Centralised primary/secondary heating systems with low loss headers to facilitate integration of DH services
   - Incoming pipework installed through the basement box wall to facilitate ease of future connection and to eliminate future builder's work
   - Space allocation provision in service risers for future heating pipework

5. Air-tight building construction methods and materials will be used to support the efficient operation of the heat recovery mechanical ventilation and heating systems (maximum air permeability of 3.0m^3/hour/m^2). The building will be pressure tested in accordance with BSRIA standards to ensure this maximum leakage rate is not exceeded

6. Pressurised water services using variable speed drive multi-stage booster pump sets. Variable Speed Drive (VSD) technology can realise energy savings of up to 50% compared to standard fixed-speed pumps, as the pump motors ramp up and down to accurately match the load requirements

7. Water services will incorporate low-flow fittings (push-type percussion spray taps and aerated shower heads)

8. Use of low-energy compact fluorescent (A-rated) lighting through, whereas incandescent lamps have an energy rating of F. Compact fluorescent lamps (CFL) will save approximately 80% electricity and last 15-times longer than standard incandescent lamps

9. LED lighting, both externally and internally in common areas, circulation spaces and basement car parks. LED technology results in 30-35% reduction in electrical energy usage over the CFL equivalent. Expected LED lamp life is 50,000 hours, compared to CFL T5 lamps that require replacement and disposal after 12,000 hours (WEEE Directive 2006)

10. Intelligent lighting controls in the form of Presence Detectors (PIR) and operational timers shall be used in common areas to ensure that lighting is not in operation when areas are not in use

11. Power factor correction on main electrical boards, correcting the power factor to 0.95 (a 5% saving on total electrical energy consumption)
12. Facility for electric car charging. By 2020, it is projected that every tenth car on Irish roads will be fully powered by electricity. This reflects international commitments to the reduction of CO_2 emissions under the Kyoto Protocol, because e-cards have zero exhaust pipe emissions

13. Machine-room-less (MRL) gear-less electric traction passenger lifts, complete with full collective control and traffic prediction software

14. 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 buildings' inhabitants. Daylight also represents an energy source – reducing the reliance on artificial lighting. The provision of full height glazing on the residential block elevations maximises the use of natural daylight to enhance visual comfort, without compromising thermal performance

15. The active measures have been designed to reduce the primary energy consumption through intelligent control and highly efficient plant and equipment

16. Central BMS systems to monitor usage, controls and metering (heating/cooling/power) optimises energy use. The energy management system will continuously review and fine-tune the operational efficiencies and strategy for the building services, to aid reduction of the overall energy consumption and carbon footprint

17. The high-performance glazing, limits the direct 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

3. Conclusion

The sustainable design elements of the proposed Spencer Place North Development, Spencer Dock, Dublin 1 contributes to a scheme that significantly exceeds the Building Regulations in terms of primary energy consumption and carbon dioxide emissions.

The preliminary building energy ratings for the residential elements of the scheme are consistent with those achieved for comparable high specification developments in Dublin.

The passive measures included in the design, such as maximising the use of daylight and minimising solar gain (glazing selection), reducing fabric heat loss through the building envelope and improving the air tightness significantly contribute towards reducing the loads on the active systems within the building Blocks.