Adamstown Health Centre

Sustainability / Energy Statement

CEL

Conlon Engineering Ltd
Building Services Consultants
T: 01-6334711
A: 21/22 Grafton Street Dublin 2
W:www.conloneng.com

21-22 Grafton Street, Dublin 2. | Phone: +353 16334711
brian@conloneng.com | www.conloneng.com

CEL

Conlon Engineering Ltd
Building Services Consultants
T: 01 6334711
A: 2102 Grafton Street Dublin 2
W: www.conlonengr.com

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Report Date Jul 27th 2022
Revision 4

1 Introduction

The purpose of this report is to outline the approach to design of the proposed Health Centre in Adamstown (specifically the external façade), explaining the Sustainability / Energy Assessment design decisions being made to ensure this project meets the required Building Energy Rating targets, relevant FUTURE TENANTS requirements and relative Irish Building Regulations standards as a result.

There are 2 factors driving design decisions relating to the overall fabric, sustainable design and the overall energy rating target of the Health Centre, namely:

- The future tenants Performance Specification requirements which insist that the building must be predominantly naturally ventilated but must not exceed a certain average temperature for a certain period of the occupied duration
- The future tenants Performance Specification requirements for all buildings to be NZEB rated. This condition has been relaxed to a B3 BER energy rating since the building frame/fabric is existing

These 2 factors above in-turn trigger Part L – Irish Building Regulation compliance since more the 25% of the external façade is affected as a result.

2 Sustainable Design – Effect on Energy Rating

As the existing building stands, it would have a poor BER rating being fully glazed.

The building appears to have been built for office use essentially and therefore would rely on large overall air change rates and standard air conditioning to provide comfort for occupants.
Existing windows are also not openable and therefore natural ventilation would not be an option with the existing windows, meaning that air conditioning would be needed everywhere which would be detrimental for BER rating.

To improve the buildings BER rating, and to reduce the risk of it overheating, the external façade must be upgraded for two reasons:

- Firstly, the external wall U-value is the largest single contributor to a BER rating, and as glazing has a poor U value, a new external insulated wall is essential
- Secondly the largest single offender to overheating is excessive glazing

Leaving the existing glazing and trying to achieve an improved BER by use of "renewables" would not work either as the overall impact renewables have is dwarfed by the effect of a poorly performing external façade.

The external façade needs also to be upgraded to allow the maximisation of the architectural footprint as there is a gap between the existing floorplate and the existing glass façade.

3 NZEB/BER CALCULATION METHODOLOGY

With consideration to the EU Energy Performance of Buildings Directive (EPBD), the Building Regulations Technical Guidance Document, Part L, 2019 edition (No.2), the building services design strategy for Adamstown Health Centre, will have to utilise sustainable design options and energy efficient systems that are technically, environmentally feasible for the project to achieve a suitably sustainable status as dictated by the NZEB guidelines.

For all new builds, an equivalent to a 60% improvement in energy performance on the 2008 Building Regulations is required. This means an improved energy performance for the fabric, services and lighting specification. It also introduces a mandatory requirement for renewable sources. The renewable sources must in general provide 20% of the primary energy use. The SEAI SBEMie software version 5.5h will be used to demonstrate compliance with NZEB requirements for the proposed Health Centre.

The approach to sustainable design and energy efficiency will lead to a building that will take advantage of highly efficient mechanical and electrical design solutions along with the improvement of building construction elements to reduce the requirements for energy.

The sustainability strategy for the building will be derived using a DEAP BER assessment to comply with TGD Part L 2019 & 2018 Amendments to EPBD (Energy Performance of Buildings Directive 2010/30/EU)

The objective is to obtain an NZEB rating for the proposed Health Centre while including the following elements in the overall design:

- Air Source Heat Pump (ASHP) for space heating & hot water generation
- Bi-valent technology to utilise natural gas/ASHP for seasonal efficient hot water generation
- Regenerative lift motors, machine-room-less gear-less electric traction passenger lifts complete with collective control and traffic prediction software.
- Building fabric U- Values exceeding the Building Regulations
- Part window automation for automatic space thermal control and possible night-time cooling in summer.
- Air-tight building construction to support the efficient operation of the heat-recovery mechanical ventilation system and heating. Air permeability of $5m^3/hr.m^2$ at 50 pa or less. The building will be pressure-tested in accordance with BSRIA standards to ensure that this maximum leakage rate is not exceeded.
- Pressurised water services using variable-speed drive multi stage booster pump sets. Variable-speed drive technology can realise energy saving up to 50% compared to standard fixed-speed pumps, as the pump motors ramp up & down to accurately match the load requirements.
- Water services will incorporate low-flow fittings (push-type percussion spray taps and aerated shower heads).
- Use of LED and A rated light fittings externally, internally, in common areas and circulation spaces. LED technology results in 30-35% reduction in electrical energy usage over the compact fluorescent lamps equivalent.

- Intelligent lighting controls in the form of motion sensor detection shall be used in common areas to ensure that lighting is not in operation when areas are not in use.
- Power factor correction on main electrical boards.
- General services and lighting sub metering on common areas sub distribution boards.
- Infrastructure for electric car charging.
- Building Energy Management System and software to control all HVAC plant and building services systems

The active measures will be designed to reduce the primary energy consumption through intelligent control and highly efficient plant and equipment.

On completion of the planning process for this Health Centre a provisional NZEB certificate application will be completed in advance of any construction work on site to ensure the centre design complies with the required energy rating.