O'Donnell + Tuomey

St Andrews Court

Lifecycle Report

Volumetric Bundle 3

Lifecycle Report
September 2024

Client
Dublin City Council

Contents

Section 1: Introduction

1.0 Introduction

1.01 Report Structure & Project Description

This report relates to the proposed development for Dublin City Council (DCC) at St. Andrew's Court, on the corner of Fenian Street and Sandwith Street.

Statutory Guidance: DSfNA
Sections 6.11 to 6.14 of the Sustainable Urban Housing: Design Standards for New Apartments (DSfNA) provide guidance on the 'Operation and Management of Apartment Developments.' Section 6.13 specifically states, *'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.'*

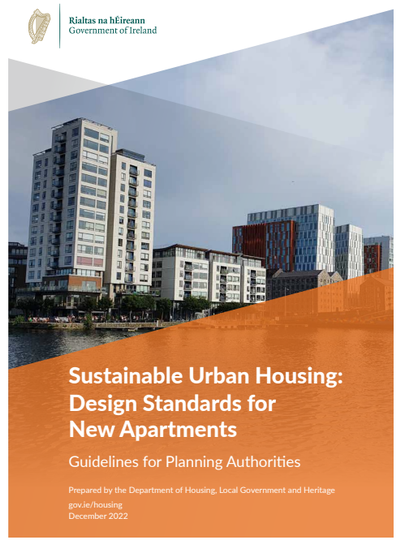
Statutory Guidance: Development Plan
Furthermore, the Dublin City Development Plan 2022-2028 states, *'All residential developments should include a building lifecycle report that sets out the long term management and maintenance strategy of a scheme. The lifecycle report should include an assessment of the materials and finishes proposed, the ongoing management strategy, the protocol for maintenance and repair, the long term maintenance costs for residents and the specific measures that have been taken to effectively manage and reduce the costs for the benefit of residents.'*

Report Structure
Accordingly, the report aims to address the requirements specified in section 6.13 of the DSfNA and the Dublin City Development Plan 2022-2028. It is structured in two sections:

Section 2 provides a comprehensive assessment of the long-term running and maintenance costs associated with the project at the time of the application.

Section 3 outlines the measures and strategies that will be implemented to manage and reduce these costs for the benefit of the residents.

Project Description
The proposal is for construction of a new development consisting of 33 no. residential units, all with private amenity space in two interconnected blocks arranged around a communal courtyard. These new homes will be for social housing and will be managed by Dublin City Council. Bike parking, bin store and plant rooms are also provided at ground floor level. The building ranges in height from four to seven stories, with a communal roof garden located on the four storey block. To facilitate the proposed development the scheme will require demolition of an existing three storey building which is currently vacant.



▲ DSfNA 2022

▲ Development Plan 2022-2028

Section 2: Assessment of Long Term Running & Maintenance Costs

2.0 Assessment of Long Term Running & Maintenance Costs

2.01 Long Term Running Costs

From the outset of the project, the Design Team have taken care to consider the long-term running costs for residents. As such, the following measures have been taken to minimise unnecessarily high running and maintenance costs running costs for all residents:

Exhaust Air Heat Pumps
All homes benefit from an Exhaust Air Heat Pump (EAHP). EAHPs recover heat from the exhaust air of a building, which would otherwise be wasted, and use it to heat fresh incoming air. This recycling of energy significantly improves overall energy efficiency. By reusing heat from exhaust air, EAHPs reduce the need for additional energy for heating, thus leading to lower utility bills.

Furthermore, as EAHPs often have fewer components than separate heating and ventilation systems, they can be easier and less expensive to maintain.

Floor to Ceiling Fenestration
Floor to ceiling fenestration is utilised in all apartments. These large windows allow more natural light to enter each apartment, thus reducing the need for artificial lighting during the day. This can significantly lower electricity usage for lighting.

During colder months, floor-to-ceiling windows allow increased levels of solar energy to be harnessed which naturally increases the internal temperature of each apartment. This in turn, reduces the need for heating and its associated costs.

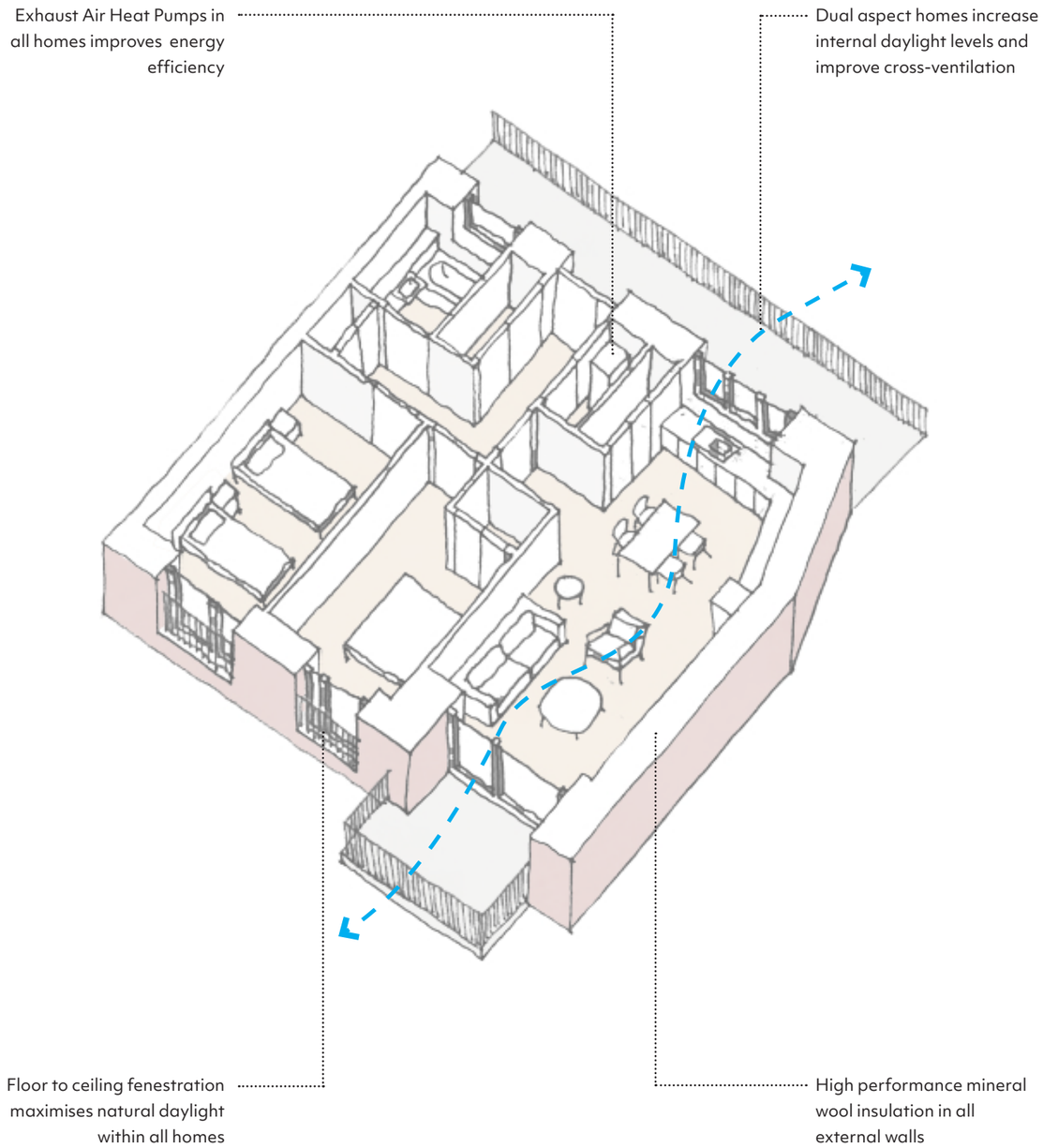
Dual Aspect Homes
All apartment layouts within the scheme are dual aspect, again increasing the levels of natural light within apartments. This in turn, further reduces artifical lighting and its associated costs.

With windows on multiple facades, dual aspect homes can achieve better cross-ventilation. This natural airflow helps cool the home during warmer months, reducing the reliance on air conditioning and lowering energy costs.

During colder months, dual aspect can help warm homes naturally by capturing sunlight from different angles thus reducing heating costs further.

Well Insulated Homes
High performing mineral wool insulation within the external envelope of the building ensures heat is retained during winter and kept out during summer. This mitigates against the reliance on constant heating and cooling systems which reduces energy consumption and associated utility costs.

External wall build-ups for all homes will be designed to achieve a U-Value of 0.13 W/m2K which is below the maximal value of 0.18 W/m2K as indicated in Table 1 of Technical Guidance Document L.



2.0 Assessment of Long Term Running & Maintenance Costs

2.02 Property Management of Common Areas

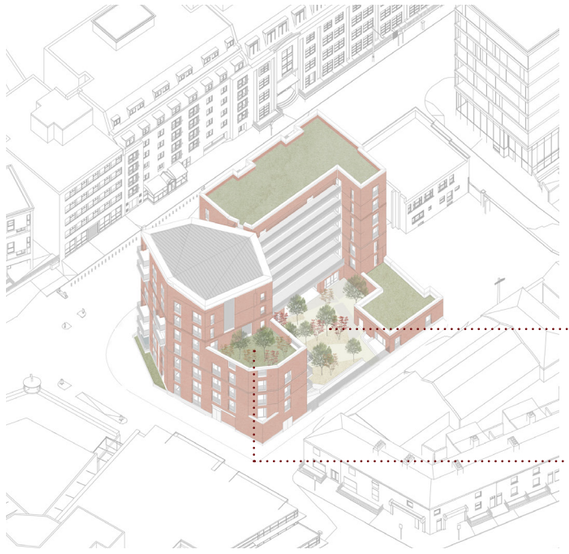
Common Areas

The day to day upkeep of the following common areas will be overseen by Dublin City Council's maintenance team:

- Ground floor courtyard,
- Level 04 roof garden,
- Street planters,
- Communal stair serving upper levels,
- Communal passenger lifts serving upper levels,
- External access decks to apartments at upper levels (Level 01 - Level 06)
- Bin Store
- Bike Store

Future Refurbishment & Maintenance

Any future refurbishment, improvement or maintenance of a non-recurring nature will be carried out, and funded by Dublin City Council.



▲ Communal Residents' Garden at ground floor

Section 3:
Measures to Manage and Reduce Costs

3.0 Measures to Manage and Reduce Costs

3.01 Treatment, Materials & Finishes

Measure	Description	Benefit
General	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 areas of the scheme and the durability and performance of the materials comprising them are designed and specified in accordance with Figure 4; Phases of the Life Cycle of BS7543; 2015, including: - Annex A Climatic Agents affecting Durability - Annex B Guidance on materials and durability - Annex C Examples of UK material or component failures and - Annex D Design Life Data sheets.	Long-term durability and maintenance of materials are integral drivers of the Design, since the early stages, and the proposed Specification of the works will reflect the same principles.
General	The primary materials are: brickwork and render, with complementary use of spandrel panels, galvanised and painted metal railings.	Proposed materials intend to ensure long term durability, counteract staining and require minimal ongoing maintenance.
General	Pitched roofs are proposed to be standing seam zinc roofs. Zinc is a self-weathering material with no need for maintenance. Installation of a fall arrest system is not necessary.	Zero to minimal maintenance required.
Building - Natural / DayLight	Daylighting to circulation areas where possible. Circulation areas are open spaces, well lit and ventilated.	Avoids the requirement for continuous artificial lighting.
Building - Natural / DayLight	Hard paving and low shrubbery are selected, with robust trees within the residential courtyard.	Robust materials selected, requiring low/minimal maintenance.
Building - Windows	Factory finished aluclad windows and doors will be installed throughout the development.	No maintenance required.
Building - Window Cleaning	Balcony doors are cleaned from the balcony area and windows open fully inwards, allowing residents to clean all fenestration themselves, with safety.	Reduces maintenance cost and reliance on 3rd party maintenance & cleaning contractors.

3.0 Measures to Manage and Reduce Costs

3.02 Landscaping

Measure	Description	Benefit
Materials - Hard Landscape	Robust, locally sourced materials, with high slip resistance to be used for paving. Anti-slip screed proposed for walkway areas. Durable and robust furniture and equipment (e.g. play, fencing etc.) to be used throughout.	Minimal maintenance / reduced frequency of maintenance and upkeep as a direct result of the use of robust materials, detailed and installed to high standards.
Materials - Soft Landscape	The planting has been carefully selected to suit the north-facing aspect of the courtyard. Tree species are selected for longevity, suitability to local soil conditions and microclimate, biodiversity (native species) and where required suitability to close proximity to residential buildings. The low planting is conceived as subtle layering of greens within the open spaces.	Reduction in the frequency / intensity of maintenance and upkeep required for planted areas.
Materials - Fittings	All external metal fittings are proposed to be galvanised and/ or powder coated to minimise painting requirements.	Minimal maintenance / reduced frequency of maintenance and upkeep as a direct result of the use of robust materials, detailed and installed to high standards.
Green Roofs	High percentage of green roofs achieved, as per the New Dublin Development Plan 2022-2028. Robust and proven detailing is proposed.	Increased biodiversity of the development.
Site Layout	The main courtyard creates a visual break within the built environment, a moment of openness and greening between streets and buildings within a densely-built central area of Dublin.	Increased biodiversity of the development.
Maintenance & Management	Planting (trees and lower planting) has been judiciously selected and used, with maintenance and management requirements in mind. Avoidance of complex planting arrangements has been favoured.	Reduced management and upkeep costs.
Sustainability & Biodiversity	North-facing aspect of the courtyard has been considered, with selected trees suitable to thrive in a north aspect. Other, lower planting species, have been selected based on their intended use and compatibility with the available space. Perimeter planting (courtyard and main street) is greening the site boundary throughout. Sedum roofs, combined with the selected plant species at ground levels, further enhance biodiversiy.	Reduces maintenance cost and reliance on 3rd party maintenance & cleaning contractors.

3.0 Measures to Manage and Reduce Costs

3.03 Waste Management

Measure	Description	Benefit
Construction and Demolition Waste Management Plan	Details regarding a Construction and Demolition Waste	The Construction and Demolition Waste Management Plan illustrates how the project adheres to best practices.
Operational Waste Management Plan	Details regarding operational waste management are set out in Construction and Environmental Management Plan preparted by Horgan Lynch Consulting Engineers	This report illustrates how the project adheres to best practice
Storage of Non- Recyclable Waste and Recyclable Household Waste	A communal bin store is located on the ground floor, offering ample space to accommodate an adequate number of bins based on the building's maximum occupancy to be collected on a weekly basis.	The communal bin store is conveniently accessible to all residents, reducing the likelihood of littering.
Domestic Waste Management Strategy	Separate bins provided for general waste, mixed recyclables, glass, and organic waste.	Helps reduce potential cross-contamination of waste, general waste charges and is in full compliance with the New Dublin Development Plan 2022-2028.
Securely Restricted Bin Store	Residents access the bin store via the courtyard, which is not open to the public. Street access is restricted to the DCC Waste Management team only.	This reduces the likelihood of the bins being used by neighboring residents or being targeted for fly-tipping by the public.
Clear Signage	Clearly signed waste storage rooms with obvious distinctions between bins for general waste, mixed recyclable, glass and organic waste.	This helps reduce potential littering, cross-contamination of waste and overall waste charges.
Composting	Organic waste bins intended to be provided in waste storage areas.	Helps reduce potential waste charges and is in full compliance with the New Dublin Development Plan 2022-2028.

3.0 Measures to Manage and Reduce Costs

3.04 Human Health & Well-being

Measure	Description	Benefit
Natural Daylight/Sunlight	The design and layout aim to maximize natural daylight in every dwelling. Floor-to-ceiling fenestration is incorporated into all main facades to provide each home with abundant natural light. Additionally, sufficient separation distances from neighboring approved developments have been carefully considered.	Reduces reliance on artifical lighting and its associated running costs.
Accessibility	All homes comply with regulations and requirements set out in Technical Guidance Documents Part M and Part K. All communal circulation spaces comply with guidance set out in 'Universal Design Guidelines For Homes in Ireland,' Section 2, 'Entering and Moving Around'	Minimises the need for adjustments and the related costs that might arise from future changes in residents' circumstances.
Universal Design Compliant Homes	The scheme provides 3 no. UD+ compliant apartments at ground floor with level access from the street and to the communal courtyard. A further 5no. apartments are UD compliant. Each of these homes have been designed in ine with guidance set out in 'Universal Design Guidelines For Homes in Ireland.'	Provides homes which meet the needs of occupants regardless of their age, size, ability or disability. UD/UD+ compliant homes also meet changing needs of residents over time so they can continue living in their own homes and communities as they get older or if they become disabled.
Security	Passive surveillance has been a key consideration from the early design stages. Upper-level external access decks overlook the ground floor communal courtyard. Street-level apartments have direct street access, enhancing active frontage. Access to back-of-house plant spaces is restricted to authorized personnel only. Additional security measures will include: - CCTV monitoring; - Fob access to entrance gates, ensuring access to residents only; - Open views towards all circulation areas, avoiding potential 'blind-spots' or hiding places; - Secure bike storage area, accessible to residents only; - Appropriately lit external spaces	Enhances safety for residents and visitors and reduces potential secuirty management costs
Communal Amenity	A more attractive public streetscape is achieved through active frontages and street-level planting. A well-lit external communal courtyard, accessible to all residents, is located at ground floor with an abundance of greenery, trees and a play space for children. Another communal amentiy space for residents is provided at level 04 which offers views towards the city.	Communal amenity spaces provide increased opportunities for fostering a strong sense of community through regular interaction with neighbours. These green areas offer a healthy environment that enhances social engagement and overall well-being for residents.

3.0 Measures to Manage and Reduce Costs

3.05 Residential Management

Measure	Description	Benefit
Home User Guide	Upon moving into their home, all residents will recieve a home user guide including: A User Information Manual This will provide important information for the resident about their new home. It will typically include information in relation to connecting with utilities and communication providers, contact details for all relevant suppliers and user Instructions for appliances and devices in the property such as EAHPs. A Residents Pack prepared by DCC This will provide information and contact details for mainteance personnel, the 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.

3.0 Measures to Manage and Reduce Costs

3.06 Transport

Measure	Description	Benefit
Access to Public Transport	Located in the core of the historic city within 5 minutes' walk of Merrion Square and Trinity College, the site is well served by public transport. In detail, Dublin Pearse is 350m away and multiple bus stops can be found within a 400m distance. Luas stops Dawson and Trinity are both within a 15min walking distance.	The proximity, frequency and range of destinations served by means of public transport enhance the accessibility levels of the proposed residential development.
Bicycle storage	There is provision of 59 secure bicycle storage spaces, within an enclosed bike store accessible from the residential courtyard.	This provision is in line with the New Dublin Development Plan 2022-2028 and promotes the uptake of cycling, an activity directly associated with decreased emissions and increased health and wellbeing.
Cycling Facilities around the site	On-street bicycle parking is available along the adjacent streets in the vicinity of the site for visitors to use. In detail, there is a Dublin Bike docking station directly across the development, on Fenian Street (station no63). Furthermore, two additional Dublin Bike docking stations are located within a 5min radius from the main entrance of St Andrews Court (stations no 25 and 57). Furthermore, there are 14 free, public locations furnished with Sheffield stands within a 5min walking radius - one of which is located directly to the left of the development, along Fenian Street (station ID: 16519).	The central location promotes the uptake of cycling, an activity directly associated with decreased emissions and increased health and wellbeing.

3.0 Measures to Manage and Reduce Costs

3.07 Energy Performance and Carbon Emissions

Measure	Description	Benefit
BER Certificates	A Building Energy Rating (BER) certificate will be supplied for each unit in the proposed development, which provides detail of the energy performance of the dwellings. A BER is calculated assessing energy use for space and hot water heating, ventilation, and lighting and occupancy. It is proposed to target an A2 rating for the apartments as a minimum, which will equate to the following emissions: A2: 25-50 kwh/m2/yr with CO2 emissions circa 10kgCO2/m2 year This is in line with the brieg requirement to achieve NZEB compliance and HPi certified status.	Higher BER ratings reduce energy consumption and running costs. Target ratings for this project are BER A2.
Building Fabric Efficiency - U-values	Thermal transmittance, also known as U-value, is the rate of transfer of heat through a structure (which can be a single material or a composite), divided by the difference in temperature across that structure. The units of measurement are W/m²K. The better-insulated a structure is, the lower the U-value will be. The proposed u-values are mandated by two driving factors: - Compliance to Building Regulation TGD Part L for Dwellings. - Achieving NZEB, as per brief requirement. The brief sets outs higher efficiencies that TGD. See below the U-values set out for the building. - External Walls 0.13W/m²K - Roofs 0.13W/m²K - Ground floor 0.13W/m²K - Windows 1.2W/m²K, G Value: 0.6 - External doors 0.7W/m²K The proposed u-values result in a highly efficient building fabric that minimises the plantroom area required. Reduction in plantrom areas have further benefits, such as reduced construction, installation, maintenance costs and a reduced building footprint within the national energy grid.	Lower energy consumption and carbon emissions projected due to the high performance of the building fabric. Heat losses and heat gains are minimised throughout the year.

3.0 Measures to Manage and Reduce Costs

3.07 Energy Performance and Carbon Emissions

Measure	Description	Benefit
Building Fabric Efficiency - Thermal bridging	Thermal bridges are areas where heat can escape the building due to lack of insulation continuity - junctions of the building fabric are more prone to heat losses. Limiting thermal bridging shall be achieved through careful design and detailing and shall be in line with Building Regulation Technical Guidance Documents Part L for Dwellings, section 1.5. Building junctions will either be designed in line with Acceptable Construction Details or be tested by an NSAI accredited thermal modeller, if deviating from the ACDs. Further on-site inspection and quality control will be described in the works requirements to ensure continuity of insulation and to limit local thermal bridging at junctions between construction elements and other locations e.g. around windows, door and other wall openings, party walls etc.	Avoidance of excessive heat losses at junctions - lower energy consumption and carbon emission.
Air tightness	The proposed air permeability goals are in line with Building Regulation Technical Guidance Documents Part L for Dwellings, setting the performance at a minimum of $3m^3/(h.m^2)$ at 50 Pa. In order to ensure that a sufficient level of air tightness is achieved, air permeability testing will be specified in the General Requirements, with the responsibility being placed on the main contractor to carry out testing and achieve the targets identified in the tender documents. Testing is to be carried out by an independent third party (National Standards Authority of Ireland or equivalent certification body).	Avoidance of excessive heat losses through the building fabric - lower energy consumption and carbon emission.
Lighting Efficiency	High efficiency LED lighting is used to reduce the heat gains from lighting with optimised lighting control in communal areas.	Reduction in the consumption of electricity and the associated carbon emissions and operating costs.
Water Consumption	Hot water taps throughout the development are to be fitted with flow restrictors to 6L/s, as per DHLGH Employer's Requirements for Detail Design of Quality Housing 2020.	Efficient water usage. Reduction in energy consumption / heat pump operational cost for hot water provision.

3.0 Measures to Manage and Reduce Costs

3.07 Energy Performance and Carbon Emissions

Measure	Description	Benefit
Air Source Heat Pump (ASHP) per Apartment	With the development identified as being outside a district heat network area with no immediate plans for a future heat network currently existing, Air Source Heat Pump (ASHP) based heating solutions were considered for the heating strategy. Heating strategies considered include ASHP high temperature communal heat network with dwelling heat interface units, ASHP ambient temperature communal heat network with dwelling water source heat pumps, dwelling balcony type split ASHP units and dwelling exhaust air heat pumps combined with Mechanical ventilation and heat recovery system. Communal type heat networks were not carried forward due to the project budget constraints. A detailed lifecycle cost analysis was carried out by the energy consultant between the split type ASHP units and Exhaust air heat pumps considering capital costs, operational costs, maintenance & plant replacement costs and resultant CO2 emissions.	Lowest life cycle cost achieved due to lower capital costs and maintenance / replacement costs.
Mechanical ventilation	MVHR units are provided in dwellings for mechanical ventilation. The units are equipped with full summer bypass function to make use of free cooling during the summer months. MVHR units are provided with a boost mode to enable occupants to increase the ventilation rate if required.	Reduction in energy consumption / carbon emission. Increase in fresh air flow ensures a healthier living environment.
Passive Ventilation	High levels of passive ventilation have been considered to reduce the likelihood of the dwellings overheating. The dwelling and window designs are provided to maximise the openable area available to each occupied space. The dwelling floor plates are relatively shallow and so occupied spaces are provided close to the façade openings. Most dwellings will benefit from cross ventilation.	Reduction in energy consumption / carbon emission. Low noise impact for neighbouring dwellings (within and around the development). Less equipment to be maintained / disposed of during the life of the building. Increase in fresh air flow ensures a healthier living environment.

3.0 Measures to Manage and Reduce Costs

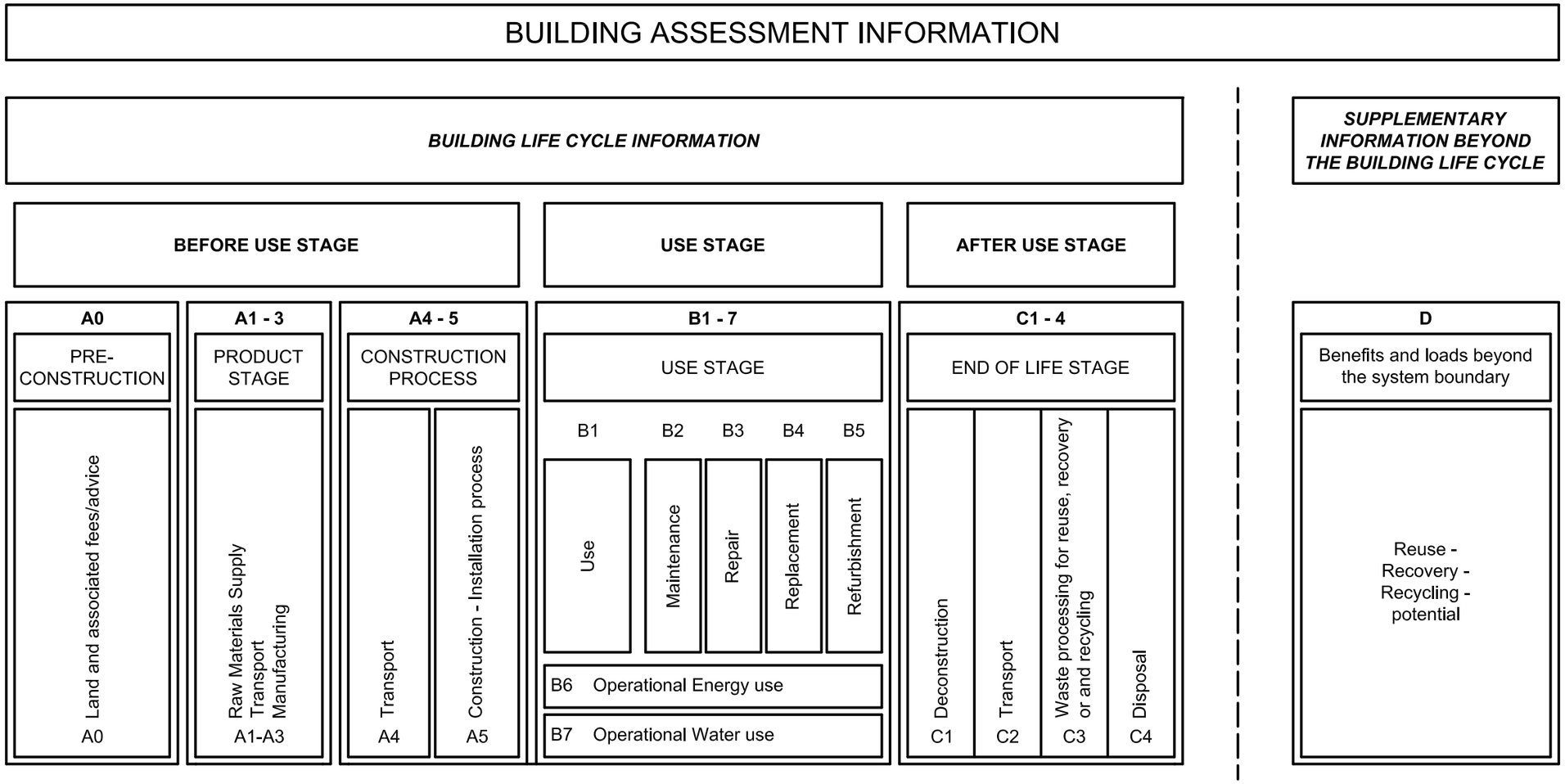
3.07 Energy Performance and Carbon Emissions

Measure	Description	Benefit
PV Panel Provision	PV panels produce high grade electricity. If generated electricity is used on site, the cost of installation is mitigated as PV eventually pays back itself throughout its lifetime. PVs could play an important role in the project becoming zero carbon in years to come. The viability of this will depend on the rate of change for; rising cost of electricity, efficiency increase of the panels, and overall cost of the installation continuing to fall. It's a viable measure in order to comply with the objectives set out in the New Dublin Development Plan 2022-2028.	Reduced fossil fuel consumption / carbon emissions. Reduced requirement for electricity directly fed from the national grid.
Overheating Mitigation	Measures to reduce the risk of overheating have been incorporated in the development since the early design stages: - Reduce the amount of heat entering the building Balconies and deck access roofs provide external shading to the dwellings below. High efficiency building fabric with low U-values incorporated in design would reduce the heat transfer from outside during summer months. The g-value and glazing ratio of windows has been selected to optimise the amount of solar heat gains and natural daylight levels throughout the year. - Minimise internal heat generation The heat distribution infrastructure and building services within the building are designed to avoid overheating. Standalone ASHPs will have no communal distribution heating pipework compared to a standard communal heat network mitigating overheating risk in communal areas. Where required pipework and ductwork are insulated to exceed the requirements of Building Regulations to reduce heat losses.	Unnecessary heat losses / gains are kept to a minimum. Reduction in energy consumption / carbon emission.

Section 4: Appendices

1.0 Appendices

1.01 Phases of the Life Cycle - BS7543; 2015



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