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ARCHITECTS

**SOCIAL HOUSING BUNDLE 4
DEVELOPMENT AT CROKE VILLAS**

LIFECYCLE ASSESSMENT REPORT

for

Dublin City Council

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1. Introduction

1.1 Requirements Of The Apartment Guidelines

The Sustainable Urban Housing; Design Standards for New Apartments – Guidelines for Planning Authorities were published in March 2018 and updated in December 2020 (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”, specifically Section 6.13.

Section 6.13 of the Apartment Guidelines 2018 requires that apartment applications shall:

“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”

“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 document sets out to address the requirements of Section 6.13 of the Apartment Guidelines.

1.2 Proposed Development

This report was prepared by Coady Architects on behalf of the National Development Finance Agency (NDFA) and Dublin City Council, to accompany a Part 8 proposal for development described as follows in the public notices.

The construction of 52 no. residential dwellings at a site c.0.88 ha at Croke Villas, Sackville Avenue, and bounded by Ballybough Road, Sackville Gardens, Sackville Avenue, Ardilaun Square, Ardilaun Road and GAA National Handball Centre, Dublin 3, which will consist of the following:

- Clearance works at the site will comprise the removal of walls and perimeter fencing and an allotment garden at the Croke Villas site bounded by Ballybough Road, Sackville Gardens, Sackville Avenue, Ardilaun Square, Ardilaun Road and GAA National Handball Centre. A wall along the boundary of the site and Irish Rail lands and railway line (to the south) will also be removed and replaced with a new boundary wall. Demolition of the remaining Croke Villas flat block is approved under Planning Authority Reg. Ref. 2946/16.
- Two apartment blocks between 4 to 5 storeys, consisting of a total of 52 no. residential units:
- Block A consists of 35 no. residential units (1 no. 1 bed and 34 no. 2 bed);
- Block B consists of 17 no. residential units (4 no. 1 bed and 13 no. 2 bed) and 152 sqm of internal community, arts, and cultural space at ground floor.
- 4 no. car parking spaces and 129 no. cycle spaces.
- Sackville Gardens street will be extended to join with Ardilaun Square to form a new perimeter street to the southern edge of Block A, which will function as a new pedestrian and cycle link and also serve as an emergency vehicle access
- Removal of undesignated car parking spaces along Sackville Avenue and construction of a new Boulevard on Sackville Avenue from the Ballybough Road junction to Ardilaun Road, which will also facilitate vehicular access.
- Provision of c. 961 sqm public open space, c.500 sqm communal open space, c.367 sqm private open space and 68 sqm of outdoor community, arts and cultural space (55 sqm facing Sackville Avenue and 13 sqm in internal courtyard).
- Boundary treatments, public lighting, site drainage works, road surfacing and footpaths, ESB substation, ESB meter rooms, plant rooms, stores, bin and bicycle storage, landscaping; and
- All ancillary site services and development works above and below ground.

2. Long-Term Running and Maintenance Costs

2.1 Procurement Method & Maintenance

It is intended that the development will be delivered through a Public Private Partnership (PPP) structure which will include maintenance and tenancy management services. Under this arrangement, the appointed PPP Company in partnership with an Approved Housing Body, will be responsible for the maintenance and management of the development and the life cycling of building elements on behalf of Dublin City Council and the residents over a 25-year period. Thereafter the maintenance and management of the development will be handed over to Dublin City Council.

Appendix A contains sample headings for a Building Investment Fund (Sinking Fund) report that identifies those works which are necessary to maintain, repair, and enhance the premises. This could be used to by the PPP Company and Dublin City Council to guide the preparation of maintenance and renewal budgets over the lifecycle of the development.

2.2 Property Management of the Apartment Units and Common Areas

The units are not planned for individual re sale. The MUDS Act and in particular the requirement to establish an Owners Management Company (OMC) shall not apply to these units unless at some stage in the future it is decided to offer the units for individual sale. In that event an OMC would be required but at this stage that is not envisaged.

2.3 Maintenance Costs/Lifecycle Costs

As part of the appointment of the PPP Company, a performance specification will be developed that will outline the level of robustness and life expectancy of materials to be used, the required maintenance regimes and the residual life of building elements at the end of the 25-year period. The performance specification will cover external envelope materials, internal and external communal areas and all areas within the public realm including approaches to providing lighting, heating, hot water provision and other services.

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.

At this planning stage, consideration has been given to the external materials to buildings, boundaries, and the public realm, and outline energy and carbon reduction strategies. The materials and services proposed will be durable and will provide a long life and low maintenance requirements for the residents.

3. Measures Considered to Effectively Manage And Reduce Costs For The Benefit Of Residents

3.1 Energy And Carbon Emissions

The following are an illustration of the energy measures that have been designed for and which the PPP Company will be able to consider for the units to assist in reducing costs for the occupants.

Measure	Description	Benefit
BER Certificates	A Building Energy Rating (BER) certificate will be provided for each dwelling in the proposed development which will provide detail of the energy performance of the dwellings. A BER is calculated through 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, and this will equate to the following emissions. A2-25-50 kwh/m2/yr with CO2 emissions c.10kgCO2/m2 /year	Higher BER ratings reduce energy consumption and running costs.
Fabric Energy Efficiency	The U-values being investigated will improve upon the requirements set out by the current regulatory requirements of the Technical Guidance Documents Part L, titled "Conservation of Fuel and Energy Buildings other than Dwellings". The overall envelope value will be based on the figures contained in the Sustainability and Climate Action Report included in this application.	Lower U-values and improved air tightness is being considered to help minimise heat losses through the building fabric, lower of energy consumption and thus minimise carbon emissions to the environment.
Lighting Efficiency	Low energy luminaires and automatic controls such as motion sensors are to be provided for electric lighting to maximize efficiency in use. LED lamps will be preferred as far as is practical. Lighting will be provided to ensure a safe environment for pedestrians, cyclists and moving vehicles, to deter anti-social behaviour and to limit the environmental impact of artificial lighting on existing flora and fauna in the area.	Low energy lamps and automatic controls improve energy efficiency. Adequate lighting levels ensure safe environments.
Energy Labelled White Goods	The white good package (where provided) in the dwellings will be of a very high standard and have a high energy efficiency rating.	The provision of high rated appliances in turn reduces the amount of electricity required for occupants.

The following are Low energy technologies that are being considered for the development and during the design stage of the development the specific combination from the list below will be decided on and then implemented to achieve the BER Rating.

Measure	Description	Benefit
Heat pumps	Air source heat pump or internal exhaust air heat pump units have been designed for and are to be considered to provide heating and hot water demands.	Heat pumps operate with efficiencies >400%. Air to water heat pumps utilise external cold air as the air source for the heat pump. Through compression, heat pumps can 'pump up' heat at low temperature and release it at a higher temperature so that it may be used again.
Mechanical Ventilation Heat Recovery (MVHR) or Demand Controlled Ventilation (DCV)	<p>With air tightness of housing improving to reduce heat loss and energy and healthy environment is needed to be considered to ensure fresh air is provided and that condensation is not an issue.</p> <p>Mechanical Ventilation Heat Recovery or Demand-controlled ventilation will be considered to provide ventilation with low energy usage.</p>	<p>MVHR provides continuous ventilation to habitable rooms with low energy usage. Continuous extract is also provided from wet rooms, with exhausted air preheating the incoming fresh air via a heat exchanger in the unit. 90% of the heat can be recovered through this process that would otherwise be wasted.</p> <p>DCV relies on continuous extract from wet rooms, without heat recovery. It incorporates automated wall vents which open/close dependent on internal humidity conditions.</p> <p>DCV is more power efficient than the MVH. MVHR is more beneficial in energy terms when the outdoor air is cold and provides a superior internal environment for occupants.</p>
Thermal Storage	<p>The application of thermal energy storage (TES) vessels coupled with heat pump technologies is being considered for several purposes:</p> <p>TES enables low energy technologies such as heat pumps to operate at low night time electricity tariffs to generate low temperature hot water for heating and DHW at night which will be drawn off during the day to offset a proportion of the heating load.</p> <p>TES also increases scope to implement other low energy technologies such as CHP</p>	<p>Reduction in operating costs.</p> <p>TES may also decrease peak electrical infrastructure required on site.</p> <p>Extend the life of plant by preventing On / Off short cycling of plant which occur at times of low heat demand</p>
District Heating System	<p>District heating (DHS) is a system for distributing heat generated in a centralised location through a system of insulated pipes space and water heating. The heat can be produced from gas boilers, CHP (Combined Heat and Power Systems) or waster heat from a third-party source such as a data centre.</p> <p>District heating is an efficient method of cutting carbon emissions. A DHS has the ability to ramp</p>	Reduction in the consumption of gas & electricity and the associated carbon emissions and operating costs.

	up and down temperatures based on external temperatures and can be used in conjunction with traditional radiator or underfloor heating systems.	
PV Solar Panels	PV Solar Panels have been considered as part of the planning application. The panels are typically placed on the South facing roof of the building for maximum heat gain and in some instances, can also be used to assist the heating system.	PV Solar Panels offer the benefit of reducing fossil fuel consumption and carbon emissions to the environment. They also reduce the overall requirement to purchase electricity from the grid.
E-Car Charging Points	A percentage of parking spaces will be provided with EV charging points in accordance with the development plan requirements. The balance of the spaces will be ducted for future installation of EV charging. Refer to Building Service Engineering drawings within the application documentation for details	Providing the option of E-car charging points will allow occupants to avail of the ever-improving efficient electric car technologies.

3.2 **Materials**

The practical implementation of the Design and Material principles has informed design of building facades, internal layouts and detailing of the proposed buildings. The façade materials are identified on the architectural drawings within this planning application.

3.3 **Buildings**

All dwellings are 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 apartment units and the common parts of the building and specific measures taken include:

Measure Description	Benefit
Natural/Passive ventilation system to circulation areas	Avoids costly mechanical ventilation systems and associated maintenance and future replacement.
External paved and landscaped areas	All of these require low/minimal maintenance.
Daylighting to circulation areas where possible	Avoids the requirement for continuous artificial lighting.

3.4 **Material Specification**

Measure Description	Benefit
<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 life of buildings and their parts.</p> <p>The common parts are designed to incorporate the guidance, best practice principles and mitigations of Annexes of BS 7543: 2015 including:</p> <p>Annex A Climatic Agents Affecting Durability</p> <p>Annex B Guidance on Materials and Durability</p> <p>Annex C Examples of UK material or component failures.</p>	Ensures that the long-term durability and maintenance of materials is an integral part of the design and specification of the proposed development.

Annex D Design Life Data sheets	
Built up warm roof system	Built up warm roof system with green roof layer over as identified in architectural drawings, reduced maintenance & easy to repair.
Brickwork to the majority of the building envelope	Requires minimal on-going maintenance
Powder-coated windows, doors	Requires minimal on-going maintenance
Powder-coated metal balustrades	Requires minimal on-going maintenance
Powder-coated metal rainwater goods	Requires minimal on-going maintenance
Aluminum louvred fins to facades	Requires minimal on-going maintenance

3.5 External Material Typical Performance Indicators

The following tables typical performance indicators for a range of external materials as described on the planning drawings:

Roof	
Description	Built up warm roof system
Typical Life Expectancy	20 years +
Robustness & Security	High – generally not in vulnerable locations
Replacement & Repair	High- easily replaced in case of damage
Typical Maintenance	Very low maintenance
External Walls	
Description	Clay brick
Typical Life Expectancy	50-80 years. Pointing, 25-50 years
Robustness & Security	Very high resistance to accidental damage
Replacement & Repair	Excellent- easily replaced
Typical Maintenance	Very low maintenance
Windows & Doors	
Description	Powder-coated aluminium
Typical Life Expectancy	30 -50 years
Robustness & Security	Good resistance to accidental damage
Replacement & Repair	Moderate- able to be touched up
Typical Maintenance	Low maintenance
Balconies & Railings	
Description	Powder-coated metal
Typical Life Expectancy	Metal structure typically 70 years
Robustness & Security	High resistance to accidental damage
Replacement & Repair	Moderate- able to be touched up
Typical Maintenance	Low maintenance
Rainwater Goods	
Description	Powder-coated metal

Typical Life Expectancy	30 -50 years
Robustness & Security	Good resistance to accidental damage
Replacement & Repair	Excellent- easily replaced
Typical Maintenance	Low maintenance
Louvres and Fins	
Description	Powder-coated metal
Typical Life Expectancy	30 -50 years
Robustness & Security	Good resistance to accidental damage
Replacement & Repair	Excellent- easily replaced
Typical Maintenance	Low maintenance

3.6 **Landscape**

Measure	Description	Benefit
Site Layout and Design	Pedestrian and cyclist friendly hierarchy of streets and open spaces are complemented by generous and high-quality landscape treatments including street tree planting and soft landscaping within public spaces providing long term high quality residential environments. Please refer to Landscape Report for further detail.	Safe, high quality residential environments reduce vandalism and antisocial behaviour issues
Hard Landscape Materials	Sustainable, robust materials, with high slip resistance to be used for paving. Durable and robust finishes to be selected for all play elements, fencing, furniture, bin and bicycle storage units.	Materials selected to minimise on-going maintenance inputs.
Soft Landscape Materials	Planting proposals have been formulated to complement the local setting as well as being proven fit for purpose in respect of private, communal and public realm uses and spatial constraints imposed by the site.	Reduction in the frequency of required soft landscape maintenance
Maintenance & Management	Maintenance and management requirements have been considered through the design process. Complex planting arrangements have been omitted thus avoiding onerous maintenance and management requirements.	Estate maintenance costs reduced
Sustainability & Biodiversity	Sustainability aspects of the proposed development include the use of native trees where possible across the site. Other species have been carefully selected for compatibility with the size of available spaces which is an important factor in long term management. The overall objective is to enhance the biodiversity potential of the site in addition to providing seasonal interest and variety. Judiciously placed flowering shrub and groundcover planting have been included to further promote biodiversity (pollinator species attracting insects and birdlife). Sedum is also included to roofs, for both SUDs benefit and biodiversity gains.	Enhanced sustainability of long-term management

3.7 Waste Management

The following measures illustrate the intentions for the management of Waste:

Measure	Description	Benefit
Construction Waste Management Plan	A Construction and Operational Waste Management Plan will be developed by the Contractor in due course	Achieving best practice in the segregation of waste, recycling and reusing where possible, reducing material to landfill and promoting the circular economy.
Operational Waste Management Plan	This application includes by an Operational Waste Management Plan prepared by a specialist consultant.	The report demonstrates how the scheme has been designed to comply with local, regional, and national waste legislation.
Storage of Non-Recyclable and Recyclable Household Waste	Inclusion of centralised waste storage areas Domestic waste management strategy: Grey, Brown and Green bin distinction. Enough space to accommodate regular collection of bins.	Easily accessible by all residents, minimizes potential littering of the scheme, reduce potential waste charges and not limit waste contractor selection
	Domestic waste management strategy: General waste, mixed recyclable and organic bin distinction.	Helps reduce potential waste charges and not limit waste contractor selection
	Security restricted waste storage rooms	Reduce potential for fly tipping by residents and non-residents
	Well signed waste storage rooms and bins	Help reduce potential cross contamination of waste and reduce waste charges.
Composting	Organic waste bins to be provided in waste storage areas	Reduces materials to landfill and waste charges

3.8 Health and Wellbeing

The following are illustrations of how the health and wellbeing of future residents are considered:

Measure	Description	Benefit
Natural / Day Light	The design, separation distances and layout of the proposed scheme has been designed to optimize natural daylight/sunlight and to provide good levels of natural light.	Reduces reliance on artificial lighting thereby reducing costs.
Accessibility	All units will comply with the requirements of Part M and Part K.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Security	The scheme is designed to incorporate passive surveillance with the following security strategies available for adaption into the design: <ul style="list-style-type: none"> • CCTV monitoring • Fobbed access into communal bin and shared bicycle facilities. • Controlled Access to individual circulation cores 	Aids in reducing potential security/management costs. Enhances safety for residents and visitors.

	<ul style="list-style-type: none"> Controlled access between Public Spaces and Residents Communal Spaces Appropriately lit external spaces 	
Natural Amenity	External spaces being provided separately for residents (communal courtyard & private balconies) and public (Quality Public Open Space)	Facilitates community interaction, socialising, and play – resulting in improved wellbeing. Proximity and use of external green spaces promotes a healthy lifestyle.

3.9 Management

Consideration has been given to ensuring the residents have a clear understanding of the subject property. COA_Report-No_Level_3

Measure	Description	Benefit
Home User Guide	<p>Consideration will be given to providing all residents with a home user guide including:</p> <p><i>User information manual</i> – this will provide important information for the purchaser on details of their new property. It typically includes details of the property such as MPRN and GPRN, Information in relation to connect with utilities and communication providers, contact details for all relevant suppliers and User Instructions for appliances and devices in the property.</p> <p><i>A Residents Pack</i> prepared by the OMC or AHB 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 rules and regulations.</p>	Residents are kept as informed as possible so that any issues can be addressed in a timely and efficient manner.

3.10 Transport

Measure	Description	Benefit
Access to Public Transport	The Croke Villas site is within 5 minutes walk of bus stops on Ballybough Road and less than 20 minutes walk from Drumcondra train station.	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.
Permeable Connections	Dedicated pedestrian and cycle infrastructure on-site, and their connectivity with adjoining lands and off-site networks.	Permeable connections for residents
Bicycle Storage	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 vehicles.
E - Car Facilities	EV charging facilities and ducting for future charging provided from a local landlord distribution board.	To accommodate the growing demand for electric vehicles which assist in decarbonising society and reducing fossil fuel dependency.

Appendix.A. Items Included in a Typical Building Investment Fund.

The table below illustrates what would be incorporated for the calculation of a Building Investment Fund Sinking Fund (Sinking Fund).

Building Investment Fund (Sinking Fund)	
Building Element	Minimum Service life (years) at Service Commencement Date*
Structure/ sub structure	60
Floor Structure	60
Roof Structure	60
Roof covering – up to 5 degree pitch	40
Roof covering – over 5 degree pitch	40
Windows	40
External wall/ cladding inc. openings	40
External doors	40
Internal partitions inc. openings	40
Internal finishes	15
Ceilings	40
Internal doors	30
Internal fixtures and fittings	15
Sanitary fittings	20
Kitchen sanitary fittings	20
Built-in furniture	20
Mechanical plant	As CIBSE Guide, Vol. B
Electrical plant	As CIBSE Guide, Vol. B
Engineering services distribution systems	As CIBSE Guide, Vol. B
CCTV installations	20
Fire installations	20
Security installations	20
Communications installations	20
Lifts	15
Underground drainage	60
External finishes -decorative coatings	25
External fences	30

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