Volume I - Non-Technical Summary of Environmental Impact Assessment Report

Proposed Residential Development

Lands West of Old Belgard Road and North, South & West of Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24

Joseph Costello, Absolute Limousines Ltd and Boherkill Property Development Ltd.

February 2021

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Preface

The Applicants, Joseph Costello, Absolute Limousines Ltd and Boherkill Property Development Ltd, has acquired the subject land) with the intention of securing the optimum land use on these underutilised sites within the Cookstown Industrial Estate. The Cookstown Industrial Estate is an area identified for 'regeneration' in the South Dublin County Development Plan 2016-2022 and is expected to be the subject of extensive urban renewal in the coming years.

The design of the subject proposal has evolved during the planning process in response to the feedback received at S247 pre-planning consultations with South Dublin County Council and SHD pre-planning consultations with An Bord Pleanala; the policies and objectives outlined in the Tallaght Town Centre Local Area Plan 2020-2026 and South Dublin County Development Plan 2016-2022; and the input of the Environmental Impact Assessment team.

The proposed development comprises of a 4-11 storey mixed-use development, comprising 1,104 no. Build-to-Rent' residential apartments, 4 no. commercial units, 1500sqm of office space and a creche. The proposed development will result in a highly accessible and sustainable modern high-quality urban residential neighbourhood having regard to the design/quality of the development proposed as well as the employment opportunities existing in the surrounding area and the sites proximity to multiple public transport services, the Tallaght Town Centre and a public open space area proposed immediately south-east under the Tallaght Town Centre Local Area Plan 2020-2026. The proposed development will improve greatly upon the existing industrial context, as illustrated in the images included below (images of the existing built environment shown on the left and verified view montages of the proposed development on the right).






1.0 Introduction

This Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) relates to a Planning Application by Joseph Costello, Absolute Limousines Ltd. and Boherkill Property Development Ltd. (referred to as the Applicant throughout) for a proposed strategic housing development comprising the demolition of the existing industrial units on site (save for the for the existing Circle K petrol station) and the construction of a mixed use development featuring 1104 no. 'build-to-rent' apartments with ancillary resident facilities, 4 no. commercial units (totalling 762sqm), 1,500sqm of office space and a 245sqm crèche, in 4 no. blocks varying in height from four to eleven storeys; road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road; construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop; and construction of a public plaza in the south-western corner of the site on lands west of Old Belgard Road and north, south & west of Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24.

Article 5(1)(e) of the EIA Directive requires that an Environmental Impact Assessment Report (EIAR) is accompanied by a NTS of the EIAR and it is transposed into Irish law under article 94(c) of the Planning and Development Regulations 2001, as amended.

This NTS presents a general overview of the proposed residential development and of associated potential environmental impacts. The term 'non-technical' indicates that this summary is intended for the educated lay person but avoids the use of technical terms, the presentation of detailed data and complex scientific discussion, that detail is presented in Volume II of the EIAR.

2.0 Environmental Impact Assessment Requirements

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, defines an EIAR as:

> *'A report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.'*

The subject development is not of a type or size that would require mandatory EIA under Annex I. With respect to Annex II, the subject proposal would constitute an "infrastructure project" under Class 10. Given the no. of units proposed, EIA is required under Class 10(b)(i) and Class 10(b)(iv). Class 10(b)(i) relates to:

> *"Construction of more than 500 dwelling units."*

In order to ensure that all potential impacts associated with the development proposal are identified and addressed, this EIAR provides a systematic and integrated evaluation of the direct, indirect and secondary effects of the project on the natural and socio-economic environment.

The aim of the approach is to identify and predict (for a given proposed development) any impacts of consequence; to describe the means and extent by which they can be avoided in the first instance or reduced or ameliorated; to interpret and communicate information about the impacts; and to provide an input into the decision making and planning process.

The aim of the EIAR is to:

- Describe the project using information on the site, design and size of the proposed development;
- Identify and predict any impacts on environmental features likely to be affected, having regard to the specific characteristics of the proposed development;
- Describe the measures envisaged in order to avoid, reduce and, where possible, remedy significant adverse effects;
- Provide the data required to identify and assess the main effects which the proposed development is likely to have on the environment; and
- Provide a Non-Technical Summary of the information.

2.1 EIAR Study Team

The EIAR was completed by a project team led by Hughes Planning and Development Consultants, who also prepared a number of the chapters.

The members of the team and their respective inputs are outlined below in Table 1.0 below.

In accordance with EIA Directive 2014/52/EU, we confirm that experts involved in the preparation of the EIAR are fully qualified and competent in their respective field. Each has extensive proven expertise in the relevant field concerned, thus ensuring that the information provided herein is complete and of high quality.

Chapter No.	Chapter Title	Contributor
Chapter 1	Introduction	Hughes Planning and Development Consultants (HPDC)
Chapter 2	Project Description and Alternatives Examined	HPDC
Chapter 3	Planning and Development Context	HPDC
Chapter 4	Population and Health	HPDC
Chapter 5	Biodiversity	Altemar Environmental Consultants
Chapter 6	Land, Soils and Geology	GDCL Consulting Engineers
Chapter 7	Water and Hydrology	GDCL Consulting Engineers
Chapter 8	Noise and Vibration	AWN Consulting Ltd
Chapter 9	Air Quality and Climate	AWN Consulting Ltd
Chapter 10	Material Assets	GDCL Consulting Engineers and NRB Consulting Engineers
Chapter 11	Archaeology, Architectural and Cultural Heritage	Courtney Deery Heritage Consultancy Ltd
Chapter 12	Landscape and Visual Amenity	Cunnane Stratton Reynolds
Chapter 13	Wind and Microclimate	B-Fluid Ltd
Chapter 14	Interactions Between Environmental Factors	HPDC in conjunction with above consultants
Chapter 15	Principle Mitigation and Monitoring Measures	HPDC in conjunction with above consultants

Table 1.0 EIAR Chapters and Contributors

3.0 Project Description

3.1 Site Location and Context

The subject application involves a large parcel of land west of Old Belgard Road and north, south & west of Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24. The subject site comprises an area of approximately 4.99Ha (12.3 acres). It includes a no. of existing industrial/commercial premises fronting Cookstown Road, Old Belgard Road and First Avenue; the Circle K Belgard petrol station and associated commercial premises; 0.98Ha of South Dublin County Council owned land; and 0.19 Ha of Dublin City Council owned land. The South Dublin County Council owned land comprises parts of First Avenue, Cookstown Road and Old Belgard Road and the Dublin City Council owned land comprises a strip to the north of Unit 5 First Avenue and Unit 4 Cookstown Road which provides access to the Belgard Luas Stop. There are existing low-rise (1-3 storeys) industrial buildings featuring on the subject site. These are proposed for demolition as part of the subject proposal.

The site is located within an area comprising industrial land use immediately east, west, south and north (in part). The western part of the subject site's northern boundary is flanked by an access road and open space area featuring 110kV power lines. Further north, is the Red Luas line and Katherine Tynan Road. In the context of the Red Luas Line, the subject site is immediately adjacent to the Belgard Road

Luas Stop which affords the subject site access to a high capacity high frequency modern public transport service.

The area immediately surrounding the subject site is known as the Cookstown Industrial Estate and features industrial and commercial land uses. The Cookstown Industrial Estate is expected to be the subject of extensive urban renewal in the coming years, with existing industrial buildings being replaced with higher density development and multi-national corporations, such as Amazon, commencing operation in the area. Currently, the majority of the immediately surrounding buildings are older building stock, save for a recently constructed 4-storey office building featuring at the Old Belgard Road and Cookstown Road roundabout. However, a number of large scale residential and mixed-use developments have been approved in the surrounding area in recent times.

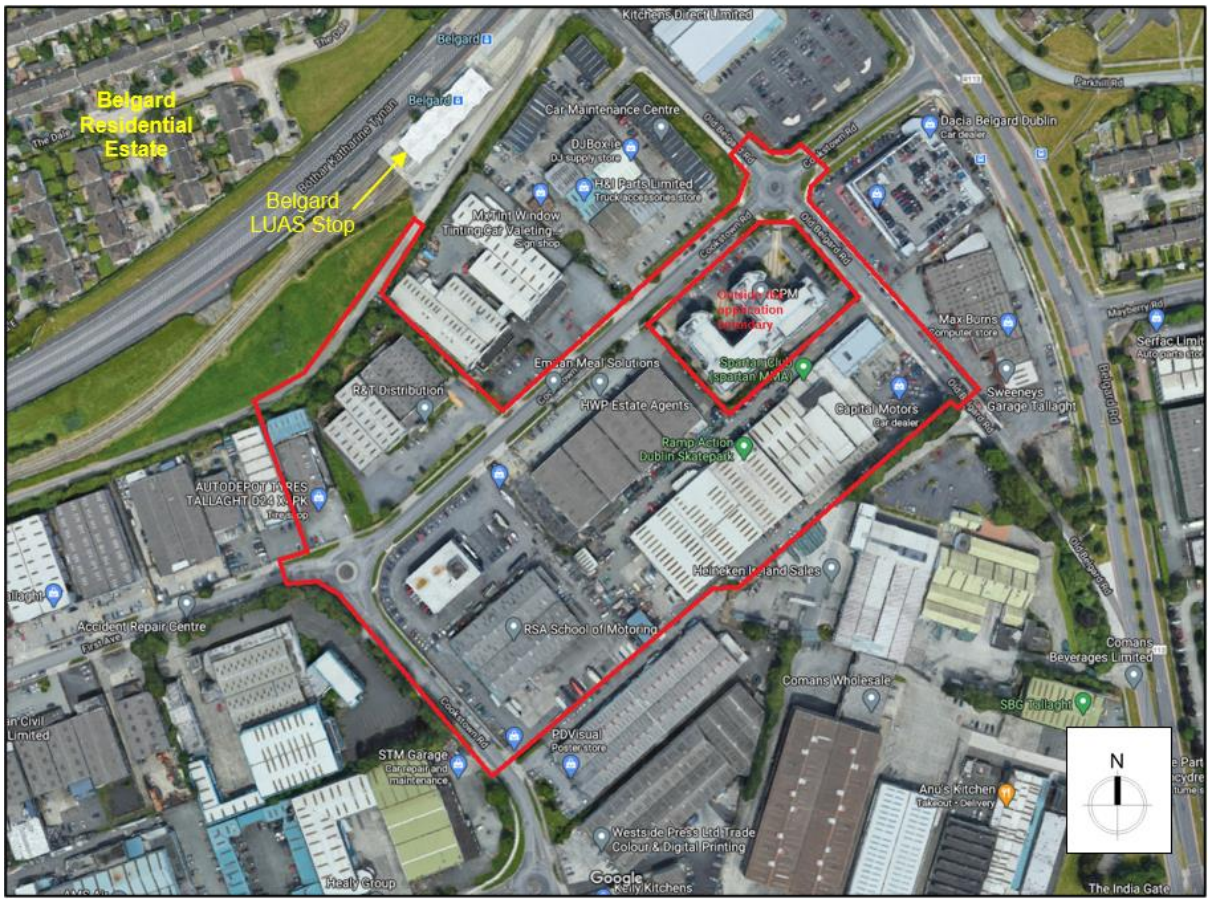

Figure 1.0 Aerial image showing the application site (outlined in red) in the context of the immediate area

Figure 2.0 Existing view of the subject site as viewed from the intersection of Cookstown Road & First Avenue looking south-east (left) and Cookstown Road (north) looking south (right)

Figure 3.0 Existing view of subject site as viewed from Cookstown Road (west) looking east (left) and Old Belgard Road looking west (right)

Figure 4.0 Existing view of subject site as viewed from the intersection of First Avenue and Cookstown Road, looking north (110kV power lines featuring in the background)

3.2 Proposed Development

The proposed development was strongly influenced by the policies and objectives contained in the Tallaght Town Centre Local Area Plan 2020-2026, as well as national planning policy objectives and requirements. The design team sought to achieve the following design principles and objectives in the proposed development:

- Creation of a vibrant mixed-use residential-led self-sustaining neighbourhood served by high quality apartments, open space areas and services/facilities and featuring buildings of high quality in terms of architecture, design, visual interest, materials/finishes, energy efficiency and residential amenity;
- Promotion of walking and cycle through the provision of road, junction and streetscape upgrade works (consistent with the Design Manual for Urban Streets, 2019) along First Avenue, Cookstown Road and Old Belgard Road; cycle parking provision in excess of the requirements set out in the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, 2018; and reduced car parking provision;
- Promotion of sustainable transport modes through the provision of a pedestrian/cycle link between Cookstown Road and the Belgard Luas Stop; improved access to the existing bus network as a result of the proposed road, junction and streetscape upgrade works; and the provision of car share facilities within the development;
- Improvements to the subject site's and surrounding area's legibility through the introduction of a new urban block structure and the provision of new streets to increase permeability through

the site and links to nearby employment opportunities/facilities and services and to Tallaght Town Centre, as well as the aforementioned road, junction and streetscape upgrade works; and

- Adoption of the recommended mitigation measures prescribed by the EIAR team to limit/negate potential environmental impacts; and
- Incorporation of appropriate setbacks from the 110kV power lines located immediately north.

The proposed development, as designed by C+W O'Brien Architects, involves the demolition of the existing industrial units on site (save for the existing Circle K petrol station) and the construction of a mixed-use development featuring 1104 no. 'build-to-rent' apartments with ancillary resident facilities, 4 no. commercial units (totalling 762sqm), 1,500sqm of office space and a 245sqm crèche, in 4 no. blocks varying in height from four to eleven storeys, on the 4.99Ha site.

The development provides a total of 1,860 no. bicycle spaces, inclusive of 1464 no. spaces to serve the proposed residents of the development and 396 no. spaces to serve the visitors. This, in addition to the pedestrian links to the Belgard Luas Stop immediately north-east, will promote sustainable travel among residents of the development and the surrounding area more broadly in the context of the pedestrian/cycle links provided.

Further to bicycle parking, the development will be served by 351 no. parking spaces (including 17 no. limited mobility parking spaces and 16 no. car share spaces), provided in 4 no. podium level car parks (1 no. provided per block), in a car park provided south of the Circle K petrol station being retained on site and on the street.

The proposed development also includes road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop; and construction of a public plaza in the south-western corner of the site.

Figure 2.0 Site layout plan of proposed mixed use development

Figure 3.0 Ground and first floor landscape masterplan for the proposed development

Figure 4.0 CGI of the proposed development

Figure 5.0 CGI of the proposed development

Figure 6.0 CGI of the proposed development

Figure 7.0 CGI R5 of the proposed development

Figure 8.0 CGI R1 of the proposed development

The proposed development will be constructed in 4 no. phases commencing with Phase A immediately adjacent to the Luas line and ending with Phase D abutting the petrol station on the Old Belgard Road. The diagram included in Figure 9.0 overleaf indicates the phasing of the proposed development.

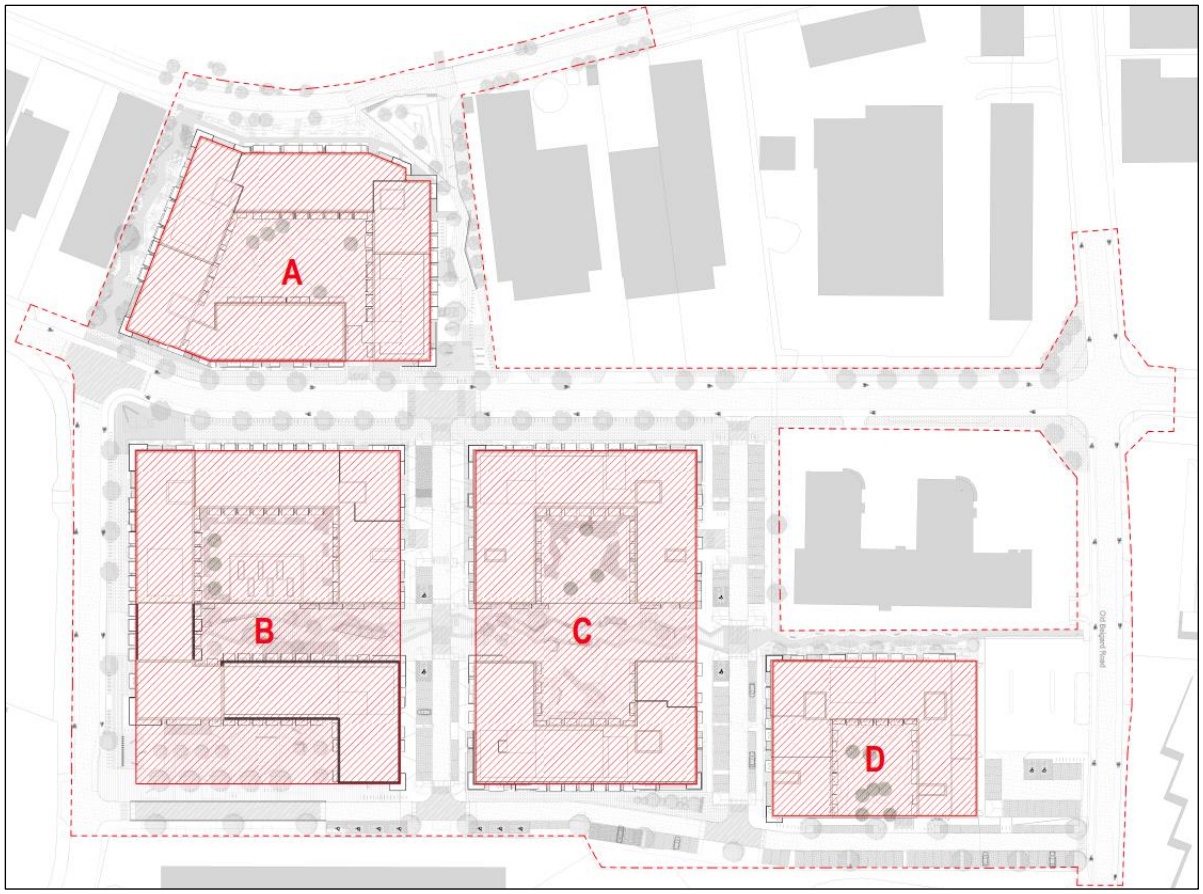

Figure 9.0 Proposed phasing of development

3.3 Alternatives Considered

The Planning and Development Regulations, 2001, as amended, require:

> *"A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment."*

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics.

With regards to alternative locations, given the zoning objectives of the subject site as a proposed regeneration area in the South Dublin County Development Plan 2016-2022, and having regard to the project's objectives, no alternative locations were considered.

The main alternatives studied during the development of this application comprise of alternative design and layout options for a largely residential development at the subject site.

The initial design stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed. These included the constraint presented by the 110kV power lines located north of the subject site.

As the design process progressed, the main alternatives studied in respect of the proposal were alternative design layouts (which generally achieved fewer unit numbers and a lower net residential density) and various options for the location of duplex apartments/apartment blocks within the scheme, pedestrian/cyclist/vehicular connections and provision of open space. These were not

pursued for reasons relating to residential amenity, consistency with the Tallaght Town Centre Local Area Plan 2020-2026 and traffic safety, among others.

Alternative design and layout options, were heavily informed by extensive pre-planning consultations undertaken with South Dublin County Council and An Bord Pleanala during preparation of the application (their feedback resulting in the inclusion of additional lands, the lodging of a single application for the entirity of the site, the phasing of the development, the inclusion of a pedestrian link to the Belgard Luas Stop and improvements to the road crossing at the Belgard Luas stop), as well as consultation with the EIAR Team. Alternative site layouts and siting progressed throughout the design process in order to minimise the impact on the receiving environment at the earliest opportunity. A series of plan excerpts illustrating the design and layout changes that occurred during the consultation process are included at Figures 10.0 to 16.0 (inclusive) below and overleaf. Section 2.4.4 in Chapter 2.0 of the EIAR includes a more extensive discussion on alternative design and layout options explored. Further to this, the Design Statement, prepared by C+W O'Brien Architects, Landscape Strategy/Design Report, prepared by Cunnane Stratton Reynolds, and Statement of Consistency & Planning Report, prepared by Hughes Planning and Development Consultants, which accompany the planning application also provide a detailed planning rationale for the development of the final layout.

Figure 10.0 Indicative site layout tabled at first S247 meeting with South Dublin County Council in May 2019

Figure 11.0 3D drawing illustrating the massing of the proposed blocks across the site tabled at first S247 meeting with South Dublin County Council in May 2019

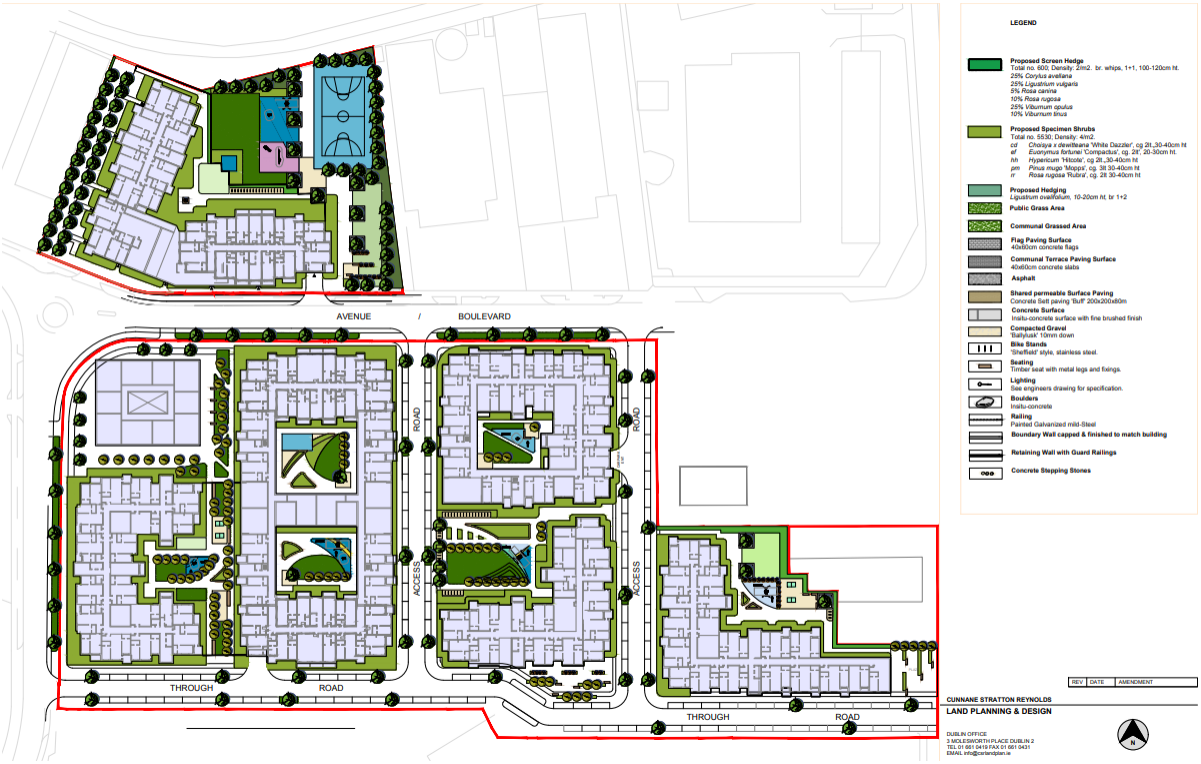

Figure 12.0 Site layout of the proposed development tabled at second S247 meeting with South Dublin County Council in July 2019

Figure 13.0 Massing/layout model for development proposed on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

Figure 14.0 Massing model for development proposed on the northern parcel tabled at the S247 meeting with South Dublin County Council in October 2019

Figure 15.0 Proposed ground floor plan tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Figure 16.0 Western elevation as viewed from Cookstown Way tabled at the pre-planning consultation with An Bord Pleanála in February 2020

The scheme proposed in this application for permission has evolved from its original form and the consideration of alternative designs has resulted in significant environmental improvements in terms of the landscape and visual contribution that the proposed development will contribute to this area as well as very significant accessibility improvements to the Belgard Luas stop.

4.0 Population and Health

The Population and Health chapter was prepared by Hughes Planning and Development Consultants and describes the significant effects of the development on the surrounding human environment in the general area of the subject site at lands west of Old Belgard Road and north, south & west of Cookstown Road, Cookstown Industrial Estate, Dublin 24. The assessment of the effects of the proposed development focuses on: population levels; impact on employment and economic activity; land use and settlement patterns; housing; community infrastructure and social facilities; health and safety; and risk of major accidents and disasters. In considering the impacts of the proposed development on the above key items, the chapter will assess the impacts of the works both during the construction phase and operation phase.

In order to assess the likely significant impacts of the proposed development on population and human health, an analysis of recent Census data was undertaken. Data relating to the Electoral Division of Tallaght Springfield (Electoral Division No. 03039), Tallaght, South Dublin County and the State, were examined.

The construction phase of the proposed development is likely to result in a positive net improvement in employment and economic activity particularly in the construction sector and in associated and secondary building services industries.

The construction phase of the project may have some short-term negative impacts on local residents during the construction phase, associated with construction traffic and possible nuisances associated with noise impact due to construction activity. However, such impacts will be short term and the implementation of the range of remedial and mitigation measures included throughout this EIAR document have been included to limit any likely adverse environmental impacts of the construction and operational phase of the proposed development on population and human health. In the longer term, the completed scheme will have long-term beneficial impacts for local businesses, residents and the wider community.

Once constructed, the proposed development will result in a positive alteration to the existing underutilised brownfield sites in terms of the provision of high quality well designed residential apartments and significant areas of open space to serve the growing need for quality housing in the Tallaght area in accordance with local, regional and national planning policy guidance. The proposed development will bring about an increase in population in the wider area, which has experienced strong population growth during the 2011-2016 intercensal period.

A diverse range of housing types are provided to satisfy different elements of housing demand and to ensure that the development is attractive to a varied cross section of the population. The proposed development will result in the addition of 1104 no. apartments to the supply of housing in the Tallaght area. These will be a mixture of studio, 1, 2 and 3 bedroom apartments. In addition, the development also complies with its Part V obligations to provide 10% of the proposed apartments for social housing and thus ensures a strong socioeconomic mix. The proposed development also features a creche located centrally on the site; 4 no. commercial units located in Blocks B and D; and internal and external communal amenity spaces scattered throughout the development, which will serve the residents of the development and the wider area.

The proposal also includes large landscaped open spaces, adjacent to the public park proposed immediately south of the subject site by the Tallaght Town Centre Local Area Plan 2020-2026 and centrally in the development, as well as a pedestrian and cycle link to the Belgard Luas Stop and footpaths/cycle paths throughout the site which link to adjacent road, pedestrian and cycle networks. These features will significantly impact the social amenities of the surrounding area in a positive manner. It will facilitate residents and visitors to gain safe pedestrian access to the Belgard Luas Stop and connect to the existing infrastructure in Tallaght Town Centre. These high quality slow mode links will improve residential amenity and support a healthy lifestyle. This will provide a significant positive impact for existing and future residents.

Residents of the proposed development as well as the surrounding area will be served by/or find employment opportunities in the 4 no. commercial units, 1,500sqm of office, crèche and open space areas provided within the proposed development. Further to this, the population growth that will occur in the area as a result of the development will contribute to the existing social and community infrastructure. The new residents of the development would likely lead to increased patronage of existing services and facilities in the wider area and the critical mass generated by the proposal would likely enhance demand for new facilities and services, which would indirectly benefit the wider area.

Having assessed the residual effects (post-mitigation), it is considered that the proposed development will not result in any significant negative effects on population and human health. It is anticipated that the proposed development will instead significantly improve the existing area, including the quality of the existing environment and have very beneficial effects on population and human health, through the creation of a mixed use, high quality, neighbourhood and by means of the delivery of residential accommodation at a time of national housing crisis.

5.0 Biodiversity

A review of the biodiversity of the site was carried out by Bryan Deegan (MCIEEM) of Altemar Ltd and this included a study of existing information from the area and a site survey.

5.1 Existing Environment

The majority of the site (>90%) comprised buildings and artificial surfaces, including warehouses, a petrol station (to be retained), hardstanding roads, footpaths and other buildings. No flora or terrestrial fauna species or habitats of National or international conservation importance were noted on site during the surveys. No evidence of bats utilising the buildings or foraging was noted on site. No invasive plant or animal species listed under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) Section 49, the Third Schedule: Part 1 Plants, Third Schedule: Part 2A Animals were noted on site. No flora species of conservation importance, or invasive species, were noted on site by the NPWS or NBDC. No amphibians or reptiles were noted on site. In relation to bird Species, no bird species on Annex I of the EU Birds Directive were noted on site by the NPWS or NBDC. However, several herring gulls were observed on site on the buildings. It should also be noted that as outlined in the infrastructure report there is currently no attenuation on site. There is no direct pathway to Natura 2000 sites.

Desk and field studies, including a bat assessment, were carried out to obtain relevant biodiversity information within the zone of influence (ZOI). An environmental ground investigation was also carried out in May 2020 by RSK Ireland Limited. A contamination assessment of the site is addressed in their report titled Generic Quantitative Risk Assessment. The soil quality assessment carried out by RSK confirmed no evidence of contamination.

No difficulties were encountered in relation to the preparation of the Biodiversity Chapter of the EIAR. There are no conservation sites within one kilometre of the proposed development site. The nearest conservation site is the Dodder Valley pNHA at 2.3km. The closest Natura 2000 site is the Glenasmole Valley SAC at 4.1 km and the nearest SPA is the Wicklow Mountains SPA at 8.1km.

5.2 Impact Assessment

Do Nothing

The site appears to be suffering from a lack of landscape maintenance. It is anticipated that should the proposed development not take place biodiversity value on site would increase assuming the maintenance continues to be neglected.

Demolition Phase

The proposed construction of the development, would potentially impact on the existing ecology of the site and the surrounding area. These potential construction impacts would include impacts that may arise during the site clearance, re-profiling of the site and the building phases of the proposed development. The proposed demolition of existing structures and development of the new onsite buildings will entail the loss of amenity grassland, built land as well as scrub and flower beds and borders. Potential Impacts are assessed below for each of the ecological components.

Construction Phase

As per demolition phase above.

Operational Phase

There is little evidence of SUDS drainage present on site with a significant un-attenuated hardstanding and roof areas. Following construction all surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures. Surface water discharge from site will be developed in accordance with the requirements of the Drainage Division as set out in the Greater Dublin Strategic Drainage Study's 'Technical Document on New Development' with regard to SUDS and Water Pollution Acts. The proposed development site is within a significant urban area

with both domestic and industrial pressures. During operation surface water would be connected to the public surface water network, while foul sewers will also connect to the existing wastewater network.

Once constructed, the proposed development will improve the existing ecological environment in terms of increased landscaping/planting and public realm improvements.

5.3 Cumulative Impact

There were no significant planning permissions identified in immediate proximity to the subject site which could, in combination with the subject proposal, have a significant cumulative effect on biodiversity. Therefore, the significance of the impact of the proposed development, is imperceptible and is considered not to change in combination with the other projects.

5.4 Mitigation

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential impacts on the ecology within the ZOI. These measures are not necessary for the protection of Natura 2000 sites.

Demolition & Construction Phases

During construction standard construction phase controls will be in place to remove silt and petrochemicals prior to discharge of surface water to the existing combined sewer which discharges to Ringsend WWTP. Additional treatment will take place in Ringsend WWTP. All measures outlined in the biodiversity chapter of the EIAR will be followed.

Operational Phase

No significant adverse effects are predicted for the operational phase thus mitigation measures are not proposed.

5.5 Residual Impact Assessment

The overall impact on the ecology of the proposed development will result in a long term positive residual impact on the ecology of the site and locality overall. This is primarily as a result of the implementation of SUDS measures on site.

5.6 Monitoring

During demolition and construction filtering of surface water prior to discharge to separate sewer and dust and silt control measures will be in place.

6.0 Lands, Soil and Geology

The Lands, Soil and Geology Chapter was prepared by GDCL Consulting Engineers. This chapter assesses the likely significant effects that the proposed development may have on land, soils and geology and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

The site is currently within an industrial estate and is predominantly covered by paved carparking areas and warehouse buildings. The ground level within the site is relatively flat and slopes down gently from west to east.

The ground conditions on the site generally comprises up to 1m of Made Ground over a Brown Boulder Clay (sandy gravelly Clay) that is stiff to hard from a depth of between 0.9m and 2m below ground level. The boreholes terminated on refusal at depths of 3.4-4.6mbgl. The Geological Survey of Ireland mapping indicates that the rock type in the vicinity of the site is from the Lucan Formation (LU) which is described as ‘Dark Limestone and Shale (Calp)’.

Construction will require the removal of soil to provide competent foundations and 6 no. small basement areas accommodating services. The depth of excavation required is estimated to be 0.7m to 1mbgl, which would be expected to be within the overburden. Therefore, excavation in rock is not required.

The hydrogeological feature identified on this site is the locally important (LI) bedrock aquifer beneath the site which is rated as having a ***Medium Importance***. The proposed development is considered to have a ***Negligible to Small Adverse*** impact significance and the overall impact significance on the Environment is considered to be ***Slight.*** The management of surface water drainage and wastewater will be via a sealed system.

A construction management plan (CMP) is to be prepared for the proposed development. This CMP will ensure effective soil and water management during construction. The CMP will cover potentially polluting activities and include emergency response procedures. The specific measures included within the CMP which are relevant to this chapter are as follows:

- **Soil Removal, Compaction and Disposal**: For example, temporary storage of soil will be carefully managed to prevent environmental impact, impact on soil structure and generation of dust. e.g. storing stockpiles away from any open surface water drains, managing height and slope of stockpile and minimising soil movement.
- **Fuel and Chemical Handling**: For example, refuelling of construction vehicles, and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off site) which will be away from surface water gulleys or drains. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area and made available.
- **Accidental Spills & Leaks:** For example, emergency response procedures for any oil leaks shall be outlined in the CMP for the site. All relevant personnel working on the site will be trained in the implementation of the procedures.

The risk to the hydrogeological feature during the construction phase is considered to be ***Not Significant*** provided the mitigation measures included in this report are implemented.

During the operational phase, the water will be supplied from the public mains and a surface water drainage design will be implemented which will discharge surface water to the public surface water network. Foul effluent will be discharged to the public foul sewer system.

It is considered that, given that the site is already predominantly covered by paved areas and that the excavation is shallow (<1mbgl) which will not require excavation into the underyling bedrock, there will be no significant changes on the overall hydrogeological regime of the area. The risk to the hydrogeological feature in the operational phase is considered to be ***Imperceptible.***

Therefore, the potential residual impacts on the hydrogeological feature are considered to be ***Not Significant***.

With the implementation of the measures highlighted above and in the construction management plan, the cumulative effect on the land, soils, geology and hydrogeology of the local environment is deemed to be ***Not Significant***.

No significant impacts on land, soil and geological environmental are anticipated.

7.0 Water and Hydrology

The Water and Hydrology Chapter was prepared by GDCL Consulting Engineers. This chapter of the EIAR comprises an assessment of the likely impact of the proposed development on existing surface water, water supply and foul drainage in the vicinity of the site as well as identifying proposed mitigation measures to minimise any impacts.

7.1 Surface Water Drainage

Assessment of the likely impact of the proposed development on surface water runoff was carried out in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), while the foul drainage discharge and water usage was carried out in accordance with the method outlined in Irish Water's Code of Practice. Two existing 300mm & 450mm diameter surface water drainage lines traverse the site which will provide a suitable surface water discharge point for the proposed development. The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging off site via an attenuation tank, flow control device and separator arrangement.

7.2 Foul Drainage

The proposed foul drainage system will be completely separate from the surface water system and will comprise a network of 225 mm diameter pipelines. The proposed foul drainage system for the entire site has been designed as one catchment, discharging to the existing 225mm diameter foul sewer located at Airton Road. Each block will be connected to the proposed 225mm diameter foul drainage system via individual 225mm pipe connections as per Irish Water Code of Practice for Wastewater Infrastructure. The existing 300mm diameter foul sewer in running in a southerly direction from Cookstown road to the existing 450mm diameter foul sewer located within the existing access lane south of the existing warehouse will be diverted. It is proposed to relocate this foul sewer under the proposed roadway and tie back into the existing 450mm diameter foul sewer located within the existing access lane. All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Irish Water's Code of Practice / Standard Details. Extensive pre-planning consultation has taken place with both South Dublin County Council (Water Services) and also with Irish Water (foul sewer drainage network and water supply). Irish Water have confirmed in writing the feasibility and acceptance of the proposed drainage and water services design by issuance of the following:

(i) Irish Water Confirmation of Feasibility Letter
(ii) Irish Water Statement of Design Acceptance
(iii) Confirmation of Feasibility of Diversion of existing 300mm foul sewer

7.3 Water Supply

An existing 100mm diameter public watermain runs along the Cookstown Estate Road which runs within the footprint of the proposed site. A 150mm diameter public watermain is located at the eastern boundary of the site. Two connections will be made to the existing watermain located within the Cookstown Estate Road watermain at the proposed eastern access to the site. A 150mm diameter (nominal bore) ring watermains will be provided along outer access roads within the site, with a number of 100mm diameter looped branch watermains provided internally to service the individual blocks. All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Irish Water's Code of Practice / Standard Details.

7.4 Hydrology

No adverse effects on surrounding hydrology is anticipated as the site is located relatively remote from the Whitestown Stream, is not located in an area subject to fluvial flooding and attenuation of surface water flows to greenfield runoff rates is being provided. In accordance with the GDSDS surface water runoff from the proposed development will be attenuated using vortex control devices (Hydrobrake or equivalent) at each outfall, limiting discharge to greenfield runoff rates. In order to adhere to this requirement, the calculated allowable surface water runoff for the entire development has been calculated as 8.4 l/s. It has been determined that a total attenuation volume of 2284 m^3 will therefore be required on site to accommodate for the 100-year storm event (provision for climate change included), as required by the GDSDS.

7.5 Flood Risk

Based on a review of Eastern CFRAM Study, the OPW's Flood Hazard Mapping, the Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022 and the South Dublin County Council Development Plan 2016-2022 the site is deemed to be at a low probability of flooding.

8.0 Noise and Vibration

AWN Consulting Ltd. have carried out an assessment of the potential noise and vibration impacts associated with the proposed residential development at Cookstown, Tallaght, Co. Dublin. The assessment identifies potential noise and vibration impacts on the environment, during both the short-term construction and longer-term operational phases. The assessment was conducted in the context of current relevant standards and guidance and used to specify appropriate limit values and mitigation measures to ensure that the impact is minimised.

The existing noise climate in the vicinity of the proposed development has been surveyed across the site over the course of a period of two typical weekdays. The key noise sources are industrial activity, road traffic noise from Bóthar Katharine Tynan and Belgard Road, and also LUAS movements.

During the construction phase of the project there is the potential for temporary noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable. For the duration of the construction period, construction noise impacts will be short-term, negative, slight to moderate. Vibration impacts during the construction phase will be short-term and negligible.

The predicted change in noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall contribution of induced traffic is considered to be of neutral, imperceptible and long-term impact to nearby residential locations. Noise levels associated with building services plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, imperceptible, long term impact.

No significant sources of vibration are expected to arise during the operational phase of the development.

The potential for inward noise impact on the proposed development has been assessed. The assessment has been carried out with reference to the guidance contained in Professional Guidance on Planning & Noise (ProPG), BS 8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings* (BSI); and the local and national Noise Action Plans relevant to the area. To achieve suitable internal noise levels within buildings located closest to the boundary with the Bóthar Katharine Tynan minimum sound insulation specifications have been provided for windows and vents.

By their nature noise and vibration impacts are localised to the area immediately adjacent to the development site. Therefore, the potential for cumulative impacts are low. The exception to this is the additional noise generated by increased traffic volumes on the surrounding road network, where the increased traffic flow can occur at locations remote from the development. However, in the context of noise, the potential for impact is low, given that very large increases in traffic volume are required to generate a noticeable noise impact. In summary, the potential for cumulative noise and vibration impacts has been assessed as part of the overall impact assessment and found to be low.

9.0 Air Quality and Climate

AWN Consulting Limited has been commissioned to conduct an assessment of the likely impact on air quality and climate associated with the proposed mixed-use development.

In terms of the existing air quality environment, data available from similar environments indicates that

levels of nitrogen dioxide (NO_2), particulate matter less than 10 microns and particulate matter less than 2.5 microns (PM_{10}/$PM_{2.5}$) are, generally, well within the National and European Union (EU) ambient air quality standards.

The existing climate baseline can be determined by reference to data from the EPA on Ireland's total greenhouse gas (GHG) emissions and compliance with European Union's Effort Sharing Decision "EU 2020 Strategy" (Decision 406/2009/EC). The EPA state that Ireland had total GHG emissions of 60.93 Mt CO_2eq in 2018. This is 5.59 Mt CO_2eq higher than Ireland's annual target for emissions in 2018. Emissions are predicted to continue to exceed the targets in future years.

The greatest potential impact on air quality during the construction phase is predicted to be from construction dust emissions and the potential for nuisance dust. In order to minimise dust emissions during construction, a series of mitigation measures were prepared in the form of a Dust Management Plan. When the dust minimisation set out in the plan are implemented, fugitive emissions of dust from the site will be imperceptible and pose no nuisance at nearby receptors (such as local residences or commercial properties).

Based on the scale and short-term nature of the construction works, the potential impact on climate change and transboundary pollution from the construction of the proposed development is deemed to be short-term and imperceptible in relation to Ireland's climate target obligations.

Traffic emissions for vehicles accessing the site during the operational phase have the potential to impact local air quality. The air dispersion modelling of traffic emissions found that levels of NO_2 and PM_{10} are in compliance with the ambient air quality standards. Operational phase impacts to air quality are deemed long-term, negative and imperceptible. The reduced car parking provision adopted in the proposed scheme seeks to minimise additional vehicular traffic and, in combination with the large no. of bicycle parking spaces, go-car spaces and pedestrian link to the Belgard Luas Stop provided, encourage sustainable transport use. This will help mitigate air and noise pollution resulting from vehicular traffic.

Traffic emissions, specifically carbon dioxide (CO_2) emissions during operation have the potential to impact climate. Dispersion modelling of operation CO_2 emissions found that levels are significantly less than Ireland's 2020 and 2030 climate targets. The impact is deemed long-term, negative and imperceptible.

The best practice dust mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the proposed development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be short-term and imperceptible with respect to human health. Operational phase traffic emissions are predicted to be in compliance with the ambient air quality limit values, therefore, impacts will be long-term, negative and imperceptible with regard to human health.

Once the mitigation measures outlined in this assessment are implemented, there will be no residual impacts of significance on air quality or climate from the construction or operational phases of the proposed development.

10.0 Material Assets

Traffic/Transportation/Roads

The Traffic/Transportation/Roads component of the Material Assets Chapter has been prepared by Mr. Eoin Reynolds, Director of NRB Consulting Engineers Ltd.

Initial reports and studies were prepared and submitted to An Bord Pleanala as part of the Pre-Application process. Chapter 10 includes a detailed response to the accessibility concerns raised by ABP and in particular to the ABP Opinion Item #2 - see Section 10.5 below. The design evolved to include lands within the control of Dublin City Council and South Dublin County Council to ensure that the layout accords with the requirements of the Tallaght Town Centre Local Area Plan 2020-2026 and DMURS in terms of creating a well-connected integrated community. This design approach has ensured

that best practice Transportation & Sustainable Planning Policies have informed the current design of the development.

A full Transportation Assessment has been undertaken in order to assess the effect of the proposed development, of 1,104 apartments/duplex apartments & the ancillary commercial elements, in accordance with the TII Guidelines for Traffic/Transportation Assessment, and having due regard also to the provisions of the local planning and transport policies of the SDCC Development Plan and the Tallaght Local Area Plan.

10.1 Receiving Environment

The site is within the long-established Cookstown Industrial Estate, which clearly has roads and kerbing which is commercial/industrial in nature and design, with high kerb and infrastructure links that were constructed to support industrial uses, but which are inappropriate for an emerging residential area. The inappropriate nature and design of the existing roads and links is being addressed as part of the planning application. The sites are currently accessed by vehicular traffic by way of Belgard Road, Old Belgard Road, and Cookstown Road.

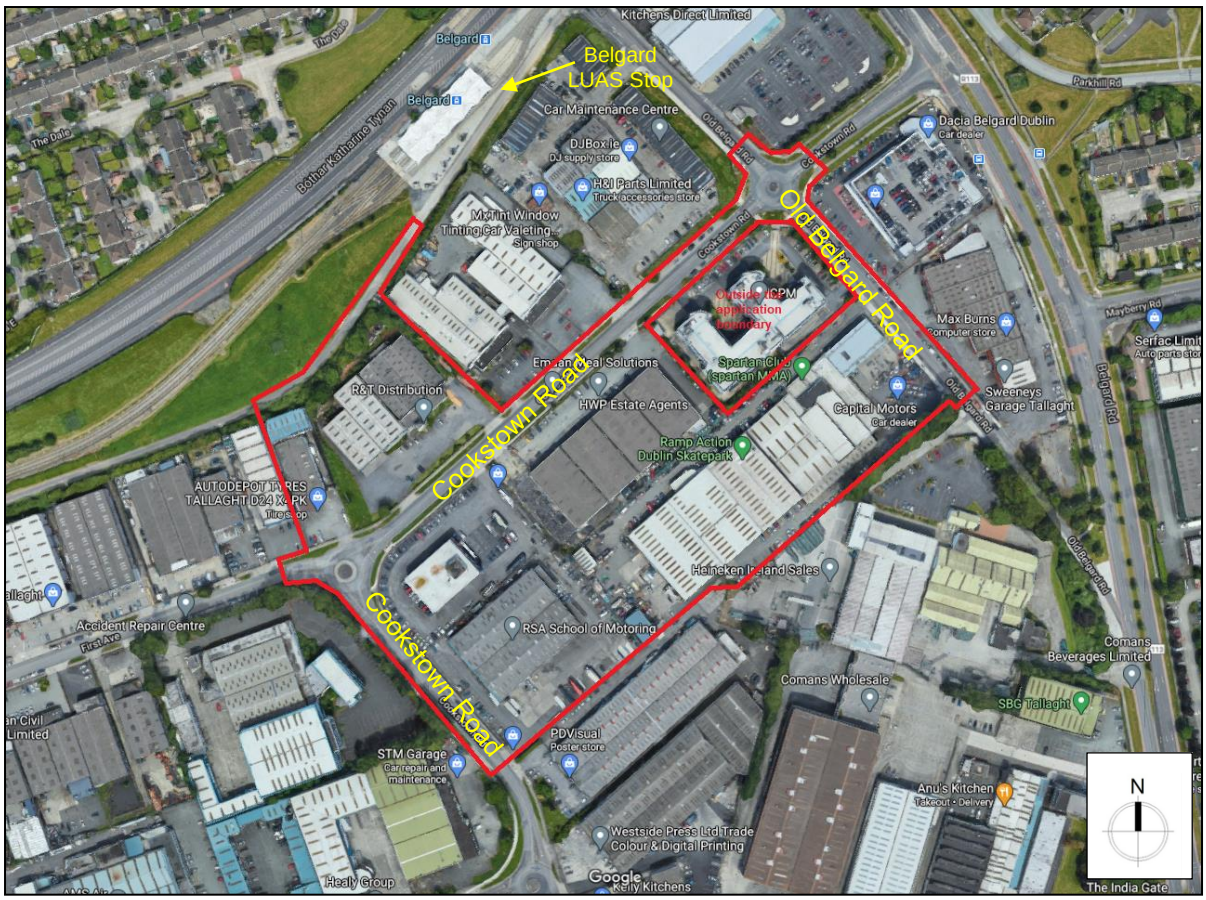

Figure 17.0 Aerial image showing the application site (outlined in red) illustrating existing access routes and road/street and site layouts

Cookstown Road is a single carriageway 2-way road, with high protective (kassel) kerbing, verges and footpaths along both sides (as illustrated in the photographs included below). It is currently subject to a 50kph speed restriction and is relatively lightly trafficked. It runs in an approximate E-W orientation through the site (as an extension to First Avenue), and also extends along the western boundary of the site where it is oriented in an approximate N-S direction. The Traffic survey indicated that the road carries a weekday AM Peak Hour 2-Way traffic flow of approximately 600 Passenger Car Units (PCUs) and a 2-way flow of 590 PCUs in the PM Peak Hour. In these terms, the road is considered moderately trafficked in terms of its link carrying capacity.

Figure 18.0 Existing view of the subject site as viewed from Cookstown Road (north) looking south (left) and Cookstown Road (west) looking east (right)

First Avenue consists of a single carriageway 2-way road, running generally in an E-W orientation, located west of the development site. It too is subject to a 50kph speed limit, and has pedestrian footpaths along its length, combined with intermittent verges and parallel parking areas. The Traffic Survey indicated that the First Avenue to the west carries a weekday AM Peak Hour traffic flow of approximately 190 PCUs, and a traffic flow of approximately 140 PCUs in the PM Peak Hour. In these terms, the road is considered very lightly trafficked in terms of its link carrying capacity.

10.2 Characteristics of the Proposed Development

The content of the individual Blocks in terms of Traffic/Transportation Assessment is outlined in detail in Table 10.1 included in Chapter 10. In summary, the entire site has a total of 1,104 Apartments set out in individual blocks with streets and infrastructure arranged in traditional N-S and E-W blocks, consistent with the Tallaght Town Centre Local Area Plan 2020-2026.

The development is served by a reduced level of car parking, a sustainable development design concept having been adopted for the scheme given the site's proximity to a high capacity LUAS and Bus Public transport network. The development includes copious secure bicycle parking and refuse management/residential storage areas within the dedicated areas. Importantly, it is proposed to remove and reconstruct the existing industrial estate roads consistent with the best practice design requirements of a residential urban area, removing and replacing the existing Industrial-type roads and road infrastructure, with the benefit of improved linkage to Belgard LUAS Stop.

The Trip Rate Information Computer System (TRICS) database is used to ascertain vehicular trip generation associated with the use of any particular site. In this case, the worst case assessment is based on TRICS, and a robust and onerous assessment has been undertaken in order to ensure that we thoroughly assess the impact, in terms of stress-testing the access junctions and the road capacity impact of the scheme. The assessment has not considered the beneficial diluting effect of the proposed road improvements, apart from the recommended upgrade of the adjacent roundabouts to traffic signal control, and this therefore represents a robust assessment of impact as traffic generated is assumed to be concentrated within the existing network rather than within a more permeable network as planned by SDCC. The Trip Rates applied in this case for each individual Block are summarised Tables 10.2, 10.3, 10.4 and 10.5 included in Chapter 10.

10.3 Mitigation and Remedial Measures

All existing roads infrastructure, and footpaths, which were designed to facilitate the historic operation of Cookstown Industrial Estate will be removed and replaced with modern high quality DMURS compliant roads, cycleways and footpaths that create an accessible residential street network within the boundary of the proposed development site (as illustrated by the image and verified view montage excerpt included in Figure 19.0 overleaf). In addition, an improved direct pedestrian link to Belgard LUAS is proposed. Copious bicycle parking is provided, together with limited and managed car parking.

Figure 19.0 Image of existing junction/roads (left) and verified view montage of the proposed junction/roads (right), taken by 3D Design Bureau, at the intersection of First Avenue and Cookstown Road

Car parking is being provided significantly below the maximum standards as set out within the South Dublin County Development Plan 2016-2022, with on average an approximate ratio of 0.3 per residential unit, including on-street provision. The lower provision of car parking will act as a demand management measure, ensuring that the development is accessed in the most sustainable manner, being almost predominantly reliant on non-car modes of travel. The lower provision of car parking is supported by a working Mobility Management Plan.

In terms of number of transport alternatives easily available to residents, it is considered that the proposed development is very highly sustainable indeed, in terms of public and alternative transport accessibility. The proximity of the development to existing public transport services means that all residents will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.

10.4 Predicted Impact of the Proposed Development

A Threshold Assessment of the impact on the local roads was carried out in order to determine whether further more detailed traffic modelling and assessment of particular critical junctions is necessary. In this regard, the outcome of this assessment is that the addition of the proposed development will not result in any significant reduction in traffic capacity arising on the local roads, with all anticipated traffic increases being below the recommended threshold levels above which further assessment is required. This is particularly so in the case of the impact upon the Belgard Road Traffic conditions.

In the case of the subject site, in the context of its former industrial uses, the assessment indicates that the conversion to local residential uses will see a significant improvement in traffic conditions for all transport modes associated with the existing roads in the area.

It should also be noted the local network improvements, removing the existing industrial roads and replacing them with a network of local streets and DMURS compliant junctions, is consistent with the LAP recommendations. These new streets and nodes, will have a very significant and beneficial effect, through the creation of a permeable residential street hierarchy that provides safe and appropriate linkages for all transport modes, with a particular emphasis on pedestrians and cyclists.

10.5 Issues Raised in ABP Opinion (Item #2)

Section 10.10 of Chapter 10, includes a detailed summary of the response to the specific issues raised within Section 2 of the ABP Opinion, dated 29th April 2020, which is comprehensively addressed in full at Appendix 10.1 to the EIAR.

For example, An Bord Pleanála requested that ***'The documentation should clarify whether and how any new pedestrian access would be provided to the LUAS Stop at Belgard and whether and how the existing roads in the industrial estate would be altered to make them suitable to serve urban residential development'*** which is responded to in the EIAR from which the following is highlighted: -

- The planning application includes for the construction of a dedicated link to the Belgard LUAS Stop;

- All of the existing Industrial Estate roads & associated junctions within the red line of the planning application are being replaced with modern residential estate quality links and infrastructure, and **Section 2.11** of the appended detailed detailed Transport Assessment Report (Appendix 10.1) states: -

  > *There are planned road improvements as part of this application, included as works within the red line, that will improve accessibility and increase local road permeability of the subject sites. The accessibility/permeability will be enhanced for all transport modes, with the removal of the inappropriate infrastructure and the replacement with modern residential-type infrastructure. The proposed altered internal roads will in particular increase accessibility to established public transport services and community facilities.*

Similarly, the Board queried ***'If separate cyclist facilities are proposed, the documentation should demonstrate whether they would comply with The National Cycle Manual and provide proper priority for cyclists over vehicles existing from minor roads at junctions'*** and in response the EIAR highlights the following:

- Proposed Cycle facilities on the Larger Public Roads are compliant with the National Cycle Manual (NCM), with advance cycle facilities and Toucan type crossings incorporated into all signal controlled junctions. Internally, for the minor streets, the cyclists infrastructure is also consistent with the NCM.

- Pedestrian and cyclist priority at minor roads, and associated traffic calming, is achieved through the use of raised platforms which afford priority to pedestrians and cyclists.

In terms of ***'The documentation should also provide a rationale for the proposed provision of parking for cars and bicycles'***, a comprehensive rationale supporting the provision of Bicycle Parking & Car Parking numbers is set out in the detailed Traffic Impact Assessment, prepared by MRB Consulting Engineers, a copy of which is provided at Appendix 10.1 to the EIAR.

Water Supply & Drainage

This chapter of the EIAR has been prepared by GDCL Consulting Engineers and comprises an assessment of the likely impact of the proposed development on existing surface water, water supply and foul drainage infrastructure, in the vicinity of the site as well as identifying proposed mitigation measure to minimize any impacts.

A full Engineering Services Report, has been prepared by GDCL Consulting Engineers and accompanies this planning application. This report and the discussion included in Section 2.3 of the Statement of Response to Pre-application Consultation Opinion, prepared by Hughes Planning and Development Consultants and the appended letter, prepared by GDCL Consulting Engineers, illustrates how the drainage and water supply issues raised in the submissions from South Dublin County Council and Irish Water have been addressed and satisfies Item #3 of the specific information requested by to An Bord Pleanála.

10.6 Research Methodology

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the relevant guidelines. Assessment of the likely impact of the proposed development on existing material assets in the vicinity of the site included:

- Review of Irish Water utility plans (surface water and foul drainage and water supply);
- Consultation with South Dublin County Council; and
- Consultation with Irish Water.

10.7 Receiving Environment

With regards to surface water drainage, the nearest EPA designated watercourse is a tributary of the River Dodder, referred to as “Whitestown Stream”, which is located some 1.1km to the south edge of the site. Two existing 300mm & 450mm diameter surface water drainage lines traverse the site. The topographical survey indicates that the site has a moderate fall from west to east. The two existing surface water sewers will provide a suitable surface water discharge point for the proposed development.

With regards to foul drainage, Irish Water records indicate the location of existing foul water drainage services in the vicinity of the site. The subject site is currently brownfield, dominated by wharehouse type units and therefore is notional foul loading at present. There is currently am existing 300mm and 450mm diameter foul sewer falling in an easterly direction and an existing 300mm diameter foul sewer falling from north to south. These foul drainage lines currently service the existing warehouses.

With regards to water supply, Irish Water records indicate the location of existing public watermains services in the vicinity of the site. An existing 100mm diameter public watermain runs along the Cookstown Estate Road which runs within the footprint of the proposed site. A 150mm diameter public watermain is located at the eastern boundary of the site.

10.8 Characteristics of the Proposed Development

In the context of surface water drainage, the existing surface water network is expected to provide a suitable discharge source for the proposed surface water network within the proposed development. The proposed surface water network for the proposed development has been designed as four separate catchments. Each of the proposed catchments with be attenuated in separate infiltration detention facilities before discharging to the aforementioned existing surface water network.

The discharge rates for these catchments will controlled by a flow control device (typically Hydrobrake) and the appropriately sized attenuation facility. Each of the proposed attenuation facilities will be sized to accommodate the 100 year storm event. Prior to discharging to the existing surface water network, surface water flows will pass through a Class 1 petrol interceptor.

Surface water runoff from the site’s road network will be directed to the proposed pipe network via conventional road gullies. Surface water runoff from traditional roof systems will be routed to the proposed surface pipe network via conventional downpipes. Surface water runoff from green roof systems will be routed to the proposed surface pipe network via an extensive substrate layer (typically 100mm deep), laid on a filter layer, water retention and drainage layer, and then routed to the proposed surface pipe network via conventional downpipes.

In the context of foul drainage, the proposed foul drainage system will be completely separate from the surface water system and will comprise a network of 225 mm diameter pipelines. The proposed foul drainage system for the entire site has been designed as one catchment, discharging to the existing 225mm diameter foul sewer located at Airton Road

Each block will be connected to the proposed 225mm diameter foul drainage system via individual 225mm pipe connections as per Irish Water Code of Practice for Wastewater Infrastructure. The existing 300mm diameter foul sewer in running in a southerly direction from Cookstown road to the existing 450mm diameter foul sewer located within the existing access lane south of the existing warehouse will be diverted. It is proposed to relocate this foul sewer under the proposed roadway and tie back into the existing 450mm diameter foul sewer located within the existing access lane.

In the context of water supply, an existing 100mm diameter public watermain runs along the Cookstown Estate Road which runs within the footprint of the proposed site. A 150mm diameter public watermain is located at the eastern boundary of the site. Two connections will be made to the existing watermain located within the Cookstown Estate Road watermain at the proposed eastern access to the site. A 150mm diameter (nominal bore) ring watermains will be provided along outer access roads within the site, with a number of 100mm diameter looped branch watermains provided internally to service the individual blocks.

10.9 Mitigation Measures

Potential impacts of the proposed development during construction and operation phase are outlined in Section 10.16 of Chapter 10. A no. of mitigation measures are outlined in relation to the construction and operational phase of development.

10.10 Predicted Impact of the Proposed Development

Implementation of the mitigation measures outlined in relation to the construction phase will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

At operational phase, the overall foul volume discharging to the existing foul network will increase due to the construction of the proposed development. However, As previously referenced, extensive consultation has taken place with Irish Water including - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design. Therefore, no cumulative impacts are anticipated in relation to foul drainage.

Implementation of the measures outlined will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

11.0 Archaeology, Architectural and Cultural Heritage

The Archaeology, Architectural and Cultural Heritage Chapter was prepared by Dr. Yolande O' Brien, Archaeological Planning Consultant at Courtney Deery Heritage Consultancy Ltd. This chapter provides an assessment of the archaeological, architectural and cultural heritage background for the mixed-use development proposed at the subject site.

The proposed development is on a brownfield site in two segments either side of the Cookstown Estate Road and along the Old Belgard Road in the northeast of the Cookstown Industrial Estate. The site is currently occupied by existing commercial buildings and hard surfaces, but a narrow strip of grassy vegetation in the northern segment may be undisturbed.

There are no recorded archaeological (Records of Monuments and Places) sites or features of architectural merit located within the proposed development site. There are no visible cultural heritage features within the development site, but a small portion of the Tallaght / Cookstown townland boundary is located within the site and historic mapping indicates that the Old Belgard Road originally passed through the application lands but was redirected at the end of the 18th century. Twentieth century development has destroyed any visible trace of these features, but it is possible that subsurface evidence of these features may be preserved beneath modern surfaces and / or under the strip of grass on the north.

This development therefore has the potential to reveal such sub-surface features and to directly impact them. Given the previous development of this area without archaeological oversight, this may provide a positive opportunity to record potential features even in a truncated or diminished state.

Architectural heritage in the wider area will not be negatively affected by the development of these lands.

While the probability of this development to impact archaeological features is low, it is recommended that a licensed archaeologist oversee the stripping of surfaces on this site following the demolition of upstanding structures. This will provide an opportunity to identify and record any potential surviving or truncated subsurface features which may include;

- The Cookstown / Tallaght townland boundary;
- The former course of the Old Belgard Road;
- Evidence of structures adjacent to the former Old Belgard Road;
- Other features such as field boundaries, archaeological features and deposits.

12.0 Landscape and Visual Amenity

This chapter was prepared by Emma Oldroyd, BA Hons. (Land Arch) Leeds Beckett University; Post Grad Dip and MA in Landscape Architecture (Leeds Beckett University; CMLI; of Cunnane Stratton Reynolds Ltd (CSR). Emma has over 15 year's experience in landscape design, assessment and analysis in Ireland and the UK.

The Landscape and Visual Impact Assessment (LVIA) was informed by a desktop study and a survey of the site in Cookstown and receiving environment in South Dublin in May 2019 and revisited in May 2020. The report identifies and discusses the townscape and receiving environment in relation to a proposed development at Cookstown, Tallaght, Dublin.

The subject lands are approximately 4.99ha and span the north-west corner of First Avenue and Cookstown Road, Cookstown Industrial Estate, Dublin 24. Currently, the lands accommodate mainly light industrial uses with some commercial uses.

12.1 Methodology for Landscape and Visual Assessment

The Landscape and Visual Amenity impact assessment of the subject development is present in Chapter 12 of the EIAR. Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity.

12.1.1 Guidelines

The methodology for assessment of the landscape and visual effects is informed by the following key guidance documents, namely:

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition 2013, published by the UK Landscape Institute and the Institute of Environmental Management and Assessment (hereafter referred to as the GLVIA).
- Guidelines on the Information to be Contained in Environmental Impact Statements, 2002, published by the Environmental Protection Agency (and the Revised Guidelines on the Information to be Contained in Environmental Impact Statements, Draft 2015).

12.1.2 Key Principles of LVIA

Landscape and visual effects

Landscape and visual effects are two interrelated but separate ideas and assessments.

- Landscape refers the physical aspects of the land and how this has been shaped by natural and cultural actions. The different combinations and distribution of landscape elements create distinctive areas of character in different places. Assessment of landscape effects is the assessment of effects on the landscape resource in its own right.

- Visual amenity refers to how people experience the places and what they see from particular viewpoints. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

12.1.3 Use of the Terms 'Effect' and 'Impact'

'Impact' is defined as the action being taken. In the case of the Cookstown Road Development, the impact would include works required to alter the existing predominantly agricultural lands to a residential area. This would include the construction and planting of the residential accommodation, along with the creche and retail area, as well as supporting road and utility infrastructure and public open spaces.

'Effect' is defined as the change or changes resulting from those actions, e.g. a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focusses on these effects.

12.1.4 Outline methodology

The following key stages were undertaken in order to establish the predicted landscape and visual effects of the development.

Receiving Environment

The following stages informed the assessment.

- A policy review to inform the selection of relevant receptors and to determine values and sensitivities
- A site visit to determine site visibility and to ascertain the characteristics of the site and its setting

These stages inform what is referred to as 'the baseline' conditions for the assessment which are used to measure the predicted effects of the development.

Receptors refer to people who or landscapes that have the potential to be affected by the proposal.

Assessment

The assessment of predicted effects on both landscape and visual receptors

Sensitivity of the Receptor. The sensitivity of each receptor is determined by a combined judgement of the receptor's susceptibility to accommodate change and the value that that has been attached to it by society. Five categories are used to classify the sensitivity of the receptor.

Magnitude of Change The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape or the view. Five categories are used to classify magnitude of landscape change.

Significance of Effects. In order to classify the significance of effects (both landscape and visual), the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint. There are seven classifications of significance, namely: (1) imperceptible, (2) not significant, (3) slight, (4) moderate, (5) significant, (6) very significant, (7) profound.

Qualitative assessment. The predicted effects are also classified as beneficial, neutral or adverse.

Longevity Assessment. The predicted effects are categorised according to their longevity, which relates to the project lifecycle as described below.

Project lifecycle. Assessments are undertaken for three stages in the project lifecycle which are:

- During construction. This stage is expected to last up to 5 years and therefore is considered short-term
- At operation. This represents the development as built. At this stage, all planting, although in the ground, will not have matured to create the long-term effect. This stage is expected to last 10-15 years and therefore is considered to be medium-term.
- At maturity. This assessment represents the final expected effect when all vegetation has matured.

12.2 The Receiving Environment

12.2.1 Policy Review

In order to carry out the assessment a desk study was undertaken which identified relevant policies and guidelines in the:

- South Dublin Development Plan 2016-2022
- Tallaght Town Centre – Local Area Plan 2020-2026.
- Landscape Character Assessment of South Dublin County – Draft Report May 2015.

12.2.2 Site Visit

A site visit was undertaken in May 2020 to assess the nature and character of the receiving environment and identify the visibility of the subject lands.

Visual Baseline

13 no. viewpoints were selected for detailed assessment of predicted effects. The selection was based upon the extent of the site visible and the sensitivity or type of viewer. Care was taken to provide a range of views from various elevations, distances, orientations and types of receptor and include locations from or close to local settlements or residences.

The viewpoints assessed are mapped below in Figure 20.0 and thumbnail images of existing views and views resulting from the proposed development are included in Table 2.0 overleaf.

Figure 20.0 Viewpoint Locations (Curtesy of Imagery@2019Google Map Data)

Existing View	Resultant View
VP01 - Belgard Community Centre / Old Belgard Road	
	
VP02 - Parkhill Road	
	
VP03 - Redwood Public Open Space	
	

VP04 - Mayberry Road and Belgard Road Intersection

VP05 - Institute of Technology Tallaght

VP06 - Belgard Square North

VP07 - Cookstown Road and Second Avenue Intersection	
	
VP08 - Lanndale Lawns Public Open Space	
	
VP09 - Katherine Tynan Road	
	

VP10 - The Meadows West	
	
VP11 - The Dale	
	
VP12 - Belgard LUAS Stop	
	

VP13 - Hospital LUAS Stop / Cookstown Way	
	

Table 2.0 Thumbnail images of existing views and views resulting from the proposed development

Landscape Baseline

The landscape resource to be assessed was determined by reviewing local studies of landscape character and by visiting the site. Three areas of landscape were determined for assessment which are: -

- The site context;
- The Cookstown Industrial Estate; and
- The subject lands.

These character areas are mapped below in Figure 12.2

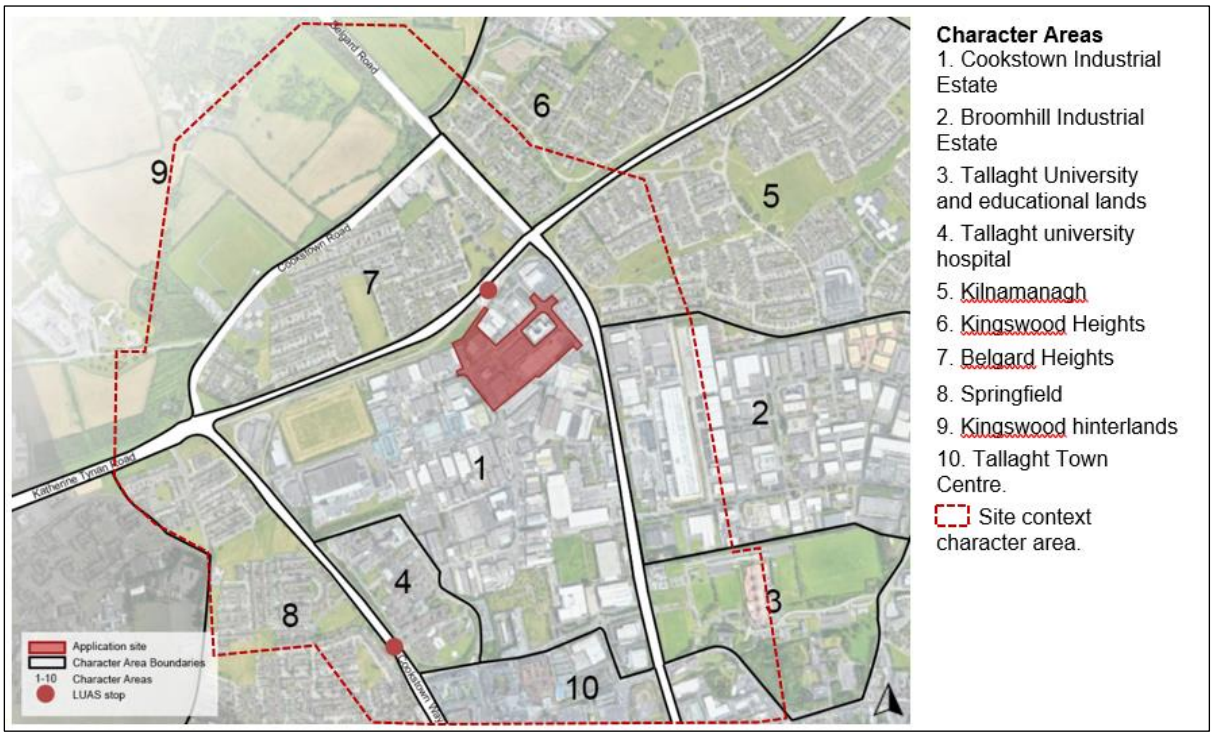

Figure 21.0 Site Context and Local Landscape Character Areas (Curtesy of Imagery@2019Google Map Data)

12.3 Value and Susceptibility

The values and characteristics of the site are listed below and can be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement.

Conservation Values

The values to be conserved indicate those aspects of the receiving environment which are valued and sensitive and could be negatively impacted on by the proposed development. The only notable sensitivity to be conserved here are;

- the views to the Dublin Mountains and agricultural hinterland from the site
- the potential impact of the development on views from Belgard Heights
- the potential to have regard of the old Townland boundary.

Enhancement Values

The values to be enhanced represents the site's capacity to accommodate change and therefore reflects landscape susceptibility. These include:

- A significant body of policy and zoning supports the development of the lands, '*to facilitate enterprise and/or residential-led regeneration'*, South Dublin Development Plan 2016-2022.
- The Tallaght Town Centre Local Area Plan 2020-2026 providing guidance on the form, structure, height and use of the lands and environs in Cookstown that is supporting of significant local change.
- The existing old-style industrial character of the area (Brownfield) leading to generally poor landscape and visual quality
- The potential to instate green infrastructure.
- Proximity to major transport routes.
- Proximity to an established and growing town centre and county town.

The enhancement values reflect change that is occurring in the landscape and its inherent robustness.

12.4 The proposal

The proposed layout for the development has a strong urban structure across four apartment blocks with a clear hierarchy of well-connected routes and spaces. The landscape masterplan produced by Cunnane Stratton Reynolds will provide an attractive setting for this mixed-use development. Views to the Dublin Mountains are retained and maximised in the development and key connections to destinations around the periphery of the site such as the LUAS station, the proposed future park and Old Belgard Road are well-integrated. There are a range of urban public parks and spaces integrated into the development. An energetic geometry connects these. Semi-private courtyard gardens are provided for each apartment block.

12.5 Remedial or Reduction Measures: Mitigation

The following recommendations are put forward to mitigate against the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the subject site.

12.5.1 Construction Phase

During construction there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity. The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

12.5.2 Operational Phase

The scheme design incorporates significant consideration and mitigation in respect of potential impacts. These include:

- The retention of the existing adjacent rows of trees.
- The construction of a large landscape earthwork to the north of the site to soften views from the north and capture views from the LUAS against the backdrop of high quality, contemporary apartment buildings.
- The careful placement buildings, trees, artwork and features to create features and focal points in the views available.
- The softening of the existing predominantly hard landscape with lawns, tree planting, vegetation and planted swales. A mix of planting types and habitats create a varied landscape structure throughout the scheme. The extensive planting of additional trees will reduce the visual mass of the buildings, soften and partially screen the development over time from various viewpoints, as identified in the assessment, thereby minimising the visual impacts.
- The inclusion landscape works, which are proposed to reduce and offset the minimal impacts generated due to the proposed development, where possible. The planting of substantial numbers of new trees and other planting in the open spaces and along internal roads will enhance the overall appearance of the new development and compensate for the removal of the hedgerow to the north of the site.
- The design of public open spaces as part of an overall design strategy that focuses on creating a ‘sense of place’ and individual character for the development area. The quality of the public realm scheme is of a high standard and the quality of materials proposed is similarly high and robust.
- The introduction of colour and texture into the urban landscape through the use of materials and planting.
- The planting of native and appropriate species for biodiversity has been incorporated into the scheme in accordance with the advice of the Project Ecologist.
- The application of best practice horticultural methods to ensure that mitigation measures establish and grow appropriately.
- The proposal of additional planting between the noethern site boundary and Katherine Tynan road to mitigate habitat loss and create a softer transition between the residential areas north and south of Katherine Tynan Road.
- The design of public open space that forms part of a network of spaces that includes areas for passive and active recreation, social / community interaction and play facilities catering for all ages.
- The retrofitting of the surrounding roads infrastructure to suit the residential use of the development – removing high kerbs and installing cycle paths and planting trees in generous verges.

12.6 Summary of the Assessment

12.6.1 Summary of Landscape Effects

The following table summarises the results of the assessment of the effects of the proposed development on the landscape resource.

Landscape Character Area	Sensitivity	Significance, Term and Quality				
		Assessment Categories	Construction Phase – temporary effects	Operational Phase		
				Short-term effects (up to 7 years)	Medium-term effects (7-15 years)	Long term effects (15 years and beyond)
Site Context	Medium	**Magnitude of Change**	Low	Medium	Medium	Medium
		Significance of Effect	Slight	Moderate	Moderate	Moderate
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial
Cookstown Industrial Estate	Low	**Magnitude of Change**	Medium	High	High	High
		Significance of Effect	Slight	Moderate-Slight	Moderate-Slight	Moderate-Slight
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial
Subject Lands	Low	**Magnitude of Change**	High	Very high	Very high	Very high
		Significance of Effect	Moderate-Slight	Moderate	Moderate	Moderate
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial

The proposed development is expected to have a temporary adverse effect on the landscape resource during construction. Upon operation and into the future, the development is expected to have a beneficial long term / permanent effect on the landscape and townscape resource in the area.

12.6.2 Summary of Visual Effects

The following table summarises the results of the assessment of the effects of the proposed development on the visual resource.

Landscape Character Area	Sensitivity	Significance, Term and Quality				
		Assessment Categories	Construction Phase – temporary effects	Operational Phase		
				Short-term effects (up to 7 years)	Medium-term effects (7-15 years)	Long term effects (15 years and beyond)
VP01. Belgard Community Centre	Medium	**Magnitude of Change**	Medium	Medium		
		Significance of Effect	Moderate	Moderate		
		Qualitative Assessment	Adverse	Neutral		
VP02. Parkhill Road	High	**Magnitude of Change**	Medium	Medium		
		Significance of Effect	Significant	Significant		
		Qualitative Assessment	Adverse	Beneficial		

VP03 Redwood Public Open Space	High	**Magnitude of Change**	Medium	Medium	Low
		Significance of Effect	Significant	Significant	Moderate-Slight
		Qualitative Assessment	Adverse	Adverse	Beneficial
VP04 Mayberry Road and Belgard Road intersection	Medium	**Magnitude of Change**	Medium	Medium	
		Significance of Effect	Moderate	Moderate	
		Qualitative Assessment	Adverse	Beneficial	
VP05 Institute of Technology Tallaght.	High	**Magnitude of Change**	Negligible	Negligible	
		Significance of Effect	Slight-Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Neutral	
VP06 Belgard Square North.	High	**Magnitude of Change**	Low	Low	
		Significance of Effect	Moderate-Slight	Moderate-Slight	
		Qualitative Assessment	Adverse	Beneficial	
VP07 Cookstown Road and Second Avenue intersection	Negligible	**Magnitude of Change**	High	High	
		Significance of Effect	Slight-Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Beneficial	
VP08 - Lanndale Lawns public open space	Medium	**Magnitude of Change**	Negligible	Negligible	
		Significance of Effect	Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Neutral	
Medium Moderate Beneficial	Low	**Magnitude of Change**	Low	Medium	
		Significance of Effect	Not Significant	Slight	
		Qualitative Assessment	Adverse	Beneficial	
VP10 - The Meadows West	High	**Magnitude of Change**	Low	Low	
		Significance of Effect	Moderate-Slight	Moderate-Slight	
		Qualitative Assessment	Adverse	Neutral	
VP11 - The Dale	High	**Magnitude of Change**	High	High	
		Significance of Effect	Significant	Significant	

		Qualitative Assessment	Adverse	Neutral	Beneficial
VP12 - Belgard LUAS stop	Medium	**Magnitude of Change**	High	High	
		Significance of Effect	Significant	Significant	
		Qualitative Assessment	Adverse	Beneficial	
VP13 – Cookstown Way / Hospital Luas stop	Medium	**Magnitude of Change**	Negligible	Negligible	
		Significance of Effect	Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Neutral	

The proposed development is expected to have an overall Neutral or Beneficial effect on local visual amenity in the long term.

12.7 Conclusion

This LVIA has assessed the impact of the proposed development at the application site. The subject lands are zoned for redevelopment and the proposed application meets that need. A high-quality proposal has been submitted that adheres to local planning policy and has been developed with the aim of the provision of an excellent place to live. The design process has incorporated into it several mitigative measures (see Section 12.8 of Chapter 12) that have contributed towards the positive conclusions reached within the assessments included in Sections 12.9 and 12.10 of Chapter 12.

Landscape Effects

The predicted landscape effects on both the site context, Cookstown industrial landscape and the subject lands themselves have been assessed as 'Beneficial' at operation and in the long-term once the landscape proposals have matured.

Visual Effects

The proposed development is expected to have a temporary adverse effect on the visual resource during construction. Upon operation and into the future, the development is expected to have a neutral or beneficial long term / permanent effect on the visual resource.

13.0 Wind and Microclimate

The Wind and Microclimate chapter has been prepared by B-Fluid Ltd. This chapter assesses the baseline conditions currently existing on site and in its immediate surrounds and likely impacts on the wind microclimate of the completed buildings and open spaces, including roof terraces.

The Wind and Micro-climate assessments have been carried out to identify the possible wind patterns around the proposed Cookstown Castle Development considering mean and peak wind conditions typically occurring in Dublin. The criteria of Lawson's Wind Comfort and Distress have been adopted to define if a specific area of the development could be comfortable and safe to pedestrians for its designated activity (i.e. standing/walking/strolling).

Results of the wind analysis have been discussed with the design team so as to configure the optimal layout for proposed Cookstown Castle Development for the objective of achieving a high-quality environment for the scope of use intended of each areas/building (i.e. comfortable and pleasant for potential pedestrian) and without compromising the wind impact on the surrounding areas and on the existing buildings.

13.1 Methodology

The wind modelling study has been performed through an Advanced Computational Fluid Dynamics (CFD) analysis; this numerical methodology simulates the movement of wind within the prescribed area. The simulations have been carried out using the concept of Large Eddy Simulation (LES) and Reynolds Average Navier-Stokes (RANS).

A total of 18 no. different wind scenarios have been studied considering variation of wind magnitude and directions in line with their frequency of occurrence based on 30 years of historical weather data. An exceedance of occurrence of 5% of the duration was considered in line with the Comfort and Distress criteria. Through the wind assessment it has been possible to highlight, at design stage, areas of concern in terms of downwash/funnelling/downdraft/ and to identify critical flow accelerations that could potentially occur.

The assessment has been carried out considering the impact of wind on the following configurations:

- The “Existing Receiving Environment”: in this case the assessment has considered the impact of the local wind on the existing area / buildings prior to construction of the proposed development. For this assessment a statistical analysis of 30 years of historical weather wind data has been carried out to find the most critical wind speeds and directions and the frequency of occurrence of the same.

- The “Potential and Predicted Impact”: in this case the assessment has considered impacts of wind on the existing environment area, the proposed Development, and its immediate vicinity, with the aim to identify potential impacts on future nearby buildings. For this scenario, Cookstown Castle Development will introduce no negative wind effect on adjacent, nearby or future phase developments within its vicinity. Wind modelling of future phases around this development will need to be performed for all future phase developments.

13.2 Potential and Predicted Impacts

The Potential and Predicted Impact of the Proposed Development has considered the impact of wind on the existing area including the proposed Cookstown Castle Development. For these scenarios, the analysis has been used to identify the critical areas of the proposed development that requires implementation of mitigation measures.

CFD modelled results of the proposed development scheme showed that:

- The proposed Cookstown Castle Development will produce a high quality environment that is attractive and comfortable for pedestrians of all categories.
- The Surrounding environment and developments properly shields all paths/walkways around and within the development. Pedestrian footpaths are always successfully shielded and comfortable.

- Areas around the development where velocities can be higher have been identified near the corners of the buildings and on some of the main roads across the blocks and around the development. However, these can be mitigated using tree landscaping, with particular attention to the corners of the buildings.

- Funnelling effects are experienced on some of the main roads around the development and on the roads in-between some of the blocks. These can be mitigated using horizontal canopies, parapet walls around a canopy, sloped canopies, a colonnade on the windward face of the base building. However, these conditions are not occurring at a frequency that would compromise the pedestrian comfort, according to the Lawson Criteria. Moreover, the implementation of tree landscaping in these areas will mitigate these effects.

- Regarding the courtyards some recirculation effect have been found for certain wind directions. However, the implementation of tree landscaping in these areas will mitigate these effects.

- The proposed development does not impact or give rise to negative or critical wind speed profiles at the nearby adjacent roads, or nearby buildings.

- The pedestrian comfort assessment, performed at Ground Floor level according to the Lawson criteria, identified the areas that are suitable for the different pedestrian activities in order to guarantee pedestrian comfort. The area all around the development seems to be suitable for every activity, including long term sitting, apart from a couple of small areas, which are indicated with light blue color and which will be mitigated with the implementation of tree landscaping. Also the courtyards are always suitable for long term sitting, short term sitting, standing, walking and strolling activities. Moreover, in terms of distress, no critical conditions were found for “Frail persons or cyclists” and “General Public” in the surrounding of the development.

- During Cookstown Castle Development construction phase the predicted impacts are classified as negligible.

13.3 Mitigation Measures

The proposed mitigation measures for the ground floor of this development is landscaping using tree plantings (as shown in the landscape drawing excerpts included in Figure 22.0 below, which creates a further reduced vorticity, making it possible to reduce incoming velocities and to mitigate some funnelling effects, thus further reducing wind impacts on the buildings, public spaces or pedestrian paths.

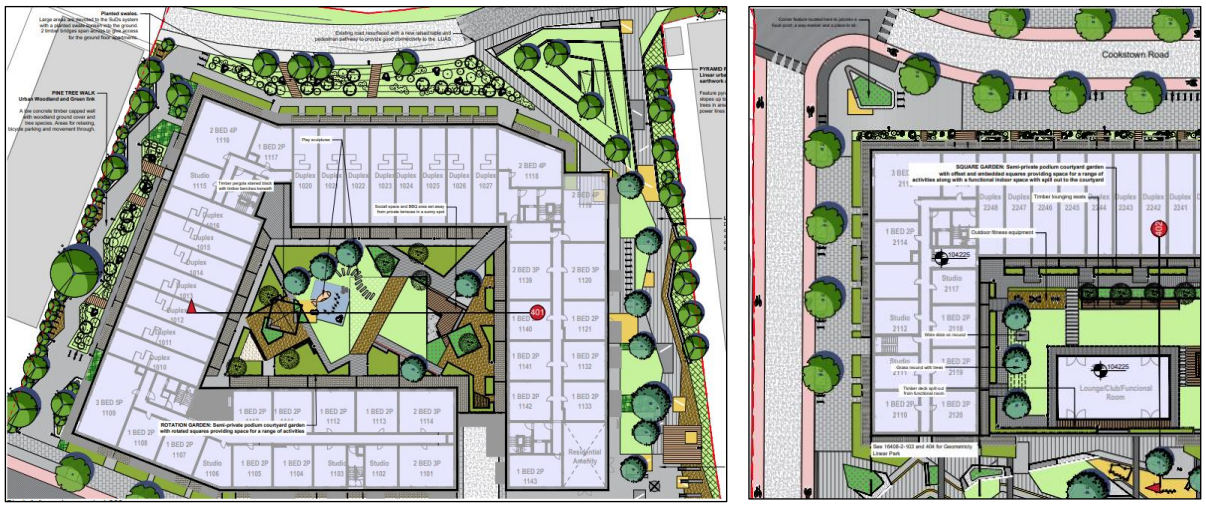

Figure 22.0 Excerpt from Drawing Nos. 16408-2-401-BLK-A (left) and 16408-2-402-BLK-B1 (right), prepared by Cunnane Stratton Reynolds illustrating proposed tree planting

These proposed mitigation measures are needed to be implemented within the development, particularly on the main roads around the development, in the roads in-betweens the different blocks, with particular attention to the corner of the buildings, as well as in the courtyards, as fully reported in the related EIAR chapter.

13.4 Residual Impacts

The impacts of implementing mitigation measures such as tree planting will result in further shielding of public spaces and pedestrian footpaths from wind. This impact is a positive effect.

14.0 Interactions Between Environmental Factors

This section describes interactions between impacts on various environmental factors. A summary matrix showing interdependencies between these environmental factors is presented below for the proposed development.

Interactions	Chapter 4.0 Population & Health	Chapter 5.0 Biodiversity	Chapter 6.0 Land, Soils & Geology	Chapter 7.0 Water & Hydrology	Chapter 8.0 Noise and Vibration	Chapter 9.0 Air Quality and Climate	Chapter 10.0 Material Assets	Chapter 11.0 Archaeology, Architectural and Cultural Heritage	Chapter 12.0 Landscape and Visual Amenity	Chapter 13.0 Wind and Microclimate
Chapter 4.0 Population & Health		✓	✓	✓	✓	✓	✓		✓	✓
Chapter 5.0 Biodiversity			✓	✓		✓				
Chapter 6.0 Land, Soils & Geology				✓						
Chapter 7.0 Water & Hydrology										
Chapter 8.0 Noise and Vibration							✓			
Chapter 9.0 Air Quality and Climate							✓			
Chapter 10.0 Material Assets										
Chapter 11.0 Archaeology, Architectural and Cultural Heritage										
Chapter 12.0 Landscape and Visual Amenity										
Chapter 13.0 Wind and Microclimate										

Table 3.0 Summary matrix showing interdependencies between various environmental factors

All potential interactions have been addressed as required throughout the EIAR. During each stage of the assessment contributors have liaised with each other (where relevant) to ensure that all such potential interactions have been addressed. The various interactions between environmental topics considered within the EIAR are further discussed in Chapter 14.0 included in Volume 2 of the EIAR.

15.0 Mitigation and Monitoring Measures

A summary of mitigation and monitoring measures has been prepared, for ease of reference and clarity, and to facilitate enforcement of all environmental mitigation and monitoring measures specified within Chapters 4.0 to 12.0 of the EIAR. All mitigation and monitoring commitments detailed within the EIAR have been included in a separate compendium and are presented in Chapter 15.0 included in Volume II of the EIAR.

Further to those outlined in the EIAR, a Construction Management Plan (CMP) will be agreed with the Planning Authority, prior to the commencement of construction activities on the site, and will incorporate provision for the primary construction mitigation measures.