Report

Non-Technical Summary of EIAR

Carmanhall Road SHD 2022

Submitted to:

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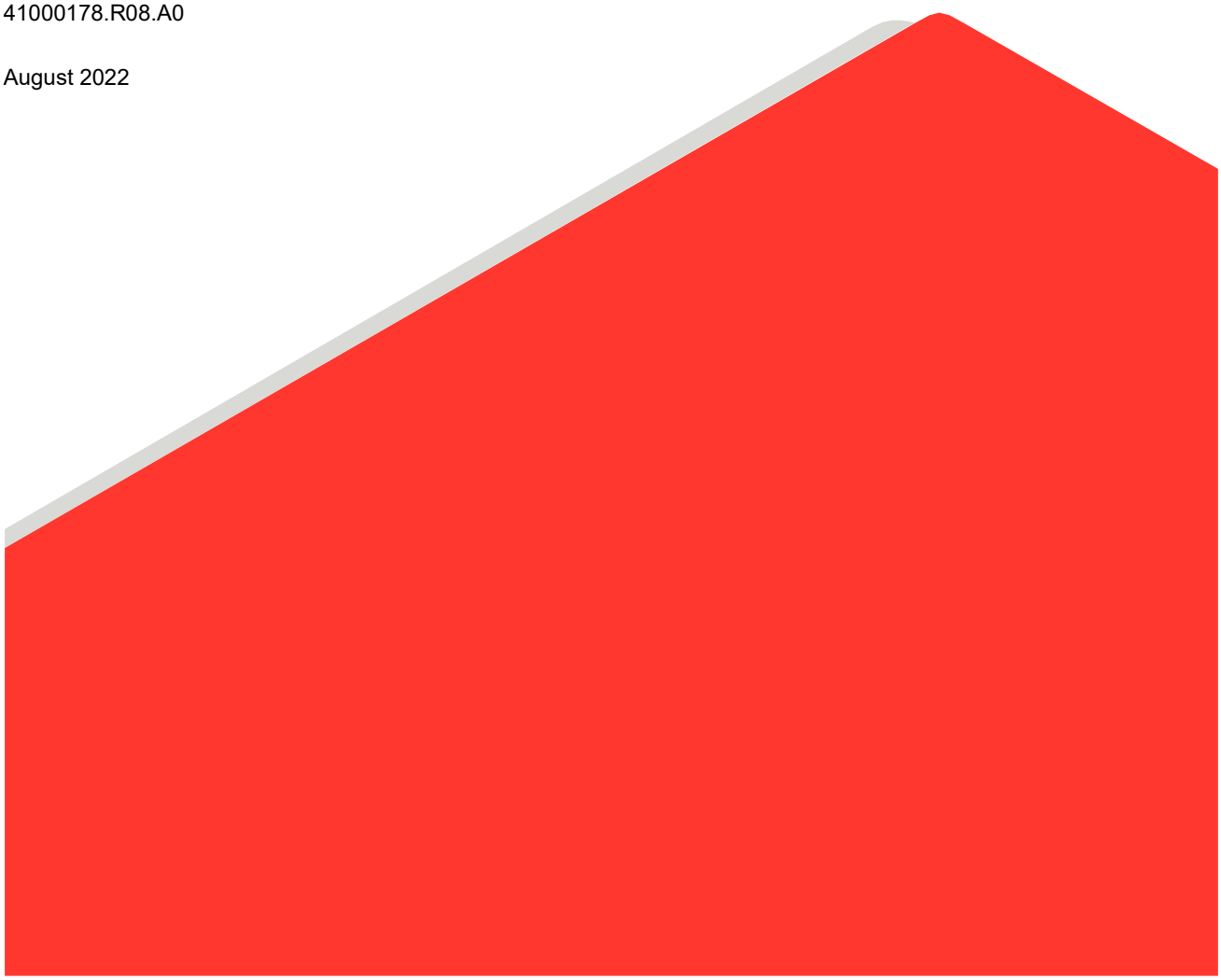

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NON-TECHNICAL SUMMARY

1.0 INTRODUCTION

Golder, member of WSP in Ireland (Golder) have been commissioned to undertake an Environmental Impact Assessment Report (EIAR) on behalf of Atlas GP Limited, as Developer and Applicant for the proposed Carmanhall Road Strategic Housing Development (SHD) 2022 on lands located at the former Avid Technology International site, located on Carmanhall Road at the Sandyford Industrial Estate, Dublin 18. The Environmental Impact Assessment Report (EIAR) sets out the details of the technical assessments that have been carried out as part of the EIA process and identifies the potential for environmental effects to arise as a result of the Proposed Development. This document provides a provides a summary of the key findings of the EIA in non-technical language.

The Application Site to which the EIA/EIAR relates is approximately 0.99 hectares (ha) in size and it is located in the Electoral Division of Dundrum-Balally, in the administrative area of Dún Laoghaire Rathdown County Council (DLRCC), County Dublin (see Figure 1). The Site is located ca. 8.8 km south-east of Dublin City Centre. The Proposed Development Site is located within Zone 5 (Residential) of the Sandyford Urban Framework Plan and DLRCC have identified Specific objectives in relation to the creation of Sustainable Residential Neighbourhoods. The application Site contains lands in the ownership of the Developer (0.73 ha) and lands in the ownership of DLRCC, largely comprising verges, roads and walkways to the north and east of the site (0.26 ha) (see Figure 1).

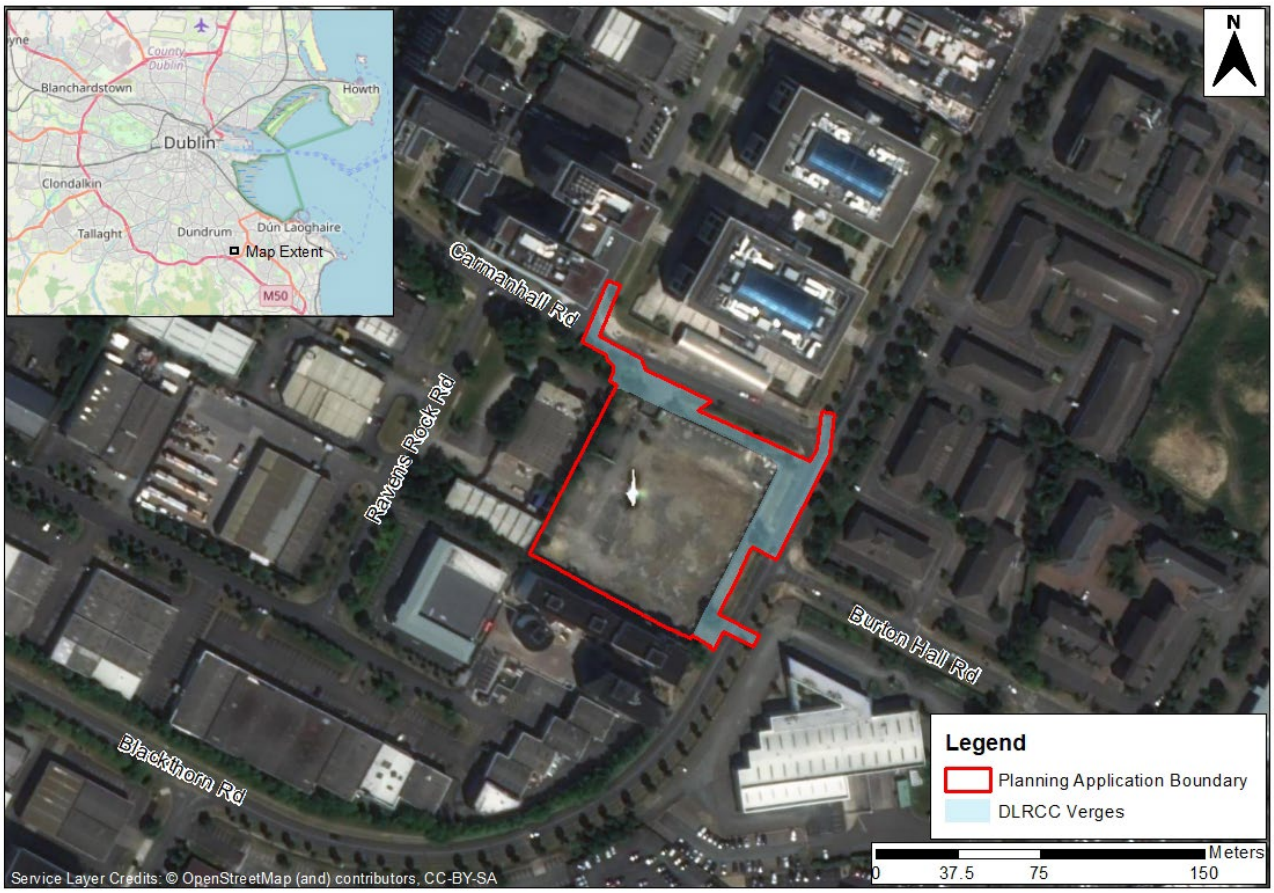

Figure 1: Location and Application Boundary of the Proposed Carmanhall Road SHD 2022

The Application Site was previously occupied by a double storey office building and associated carpark that have recently been demolished and reduced to ground level. The Site is currently vacant. Carmanhall Road abuts the site's northern boundary and Blackthorn Road abuts the site's eastern boundary. The site immediately

south of the subject site is occupied by a four-storey office building and the site immediately west is occupied by two vacant office/light industry warehouse-like two-storey structures. Vehicular access is provided in the north-western corner of the site via a crossover to Carmanhall Road. The site slopes from south to north towards Carmanhall Road.

2.0 PROJECT DESCRIPTION

2.1 Project Development Description

The 'Proposed Development', referred to as the 'Carmanhall Road SHD 2022' consists of four apartment blocks, comprising of the following:

- Block D: 10 storey facing Carmanhall Road;
- Block E: 8–16 storey facing Carmanhall Road/Blackthorn Road;
- Block F: 8 storey facing Blackthorn Road; and
- Block G: 4–5 storey facing the former Tack packaging site (which is the subject of a separate SHD application).

The development will consist of 334 Build to Rent residential apartment units within 4 no. apartment blocks and as follows:

  - *79 No. Studio*
  - *175 No. 1 bed*
  - *80 No. 2 bed*

- *All residential units provided with private balconies/terraces to the north/south/east and west elevations*
- *Crèche 272 sq.m.*
- *Residential amenity spaces 893 sq.m. (including a unit of 146.5 sqm open to the public, resident's gym, business centre, multipurpose room, staff facilities, multimedia/cinema room, shared working space, concierge, and games room)*
- *Height ranging from 5 to 16 storeys (over basement)*
- *Landscaped communal space in the central courtyard*
- *Provision of a new vehicular entrance from Carmanhall Road and egress to Blackthorn Road*
- *Provision of pedestrian and cycle connections*
- *125 No. Car Parking, 6 No. Motorcycle Parking and 447 cycle spaces at ground floor/under croft and basement car park levels*
- *Plant and telecoms mitigation structures at roof level*

The development also includes 2 no. ESB substations, lighting, plant, storage, site drainage works and all ancillary site development works above and below ground.

A Landscape Plan aims to enhance pedestrian permeability through the Site and provide multi-level amenity areas and the road, pedestrian and cycle proposals include improvements to street frontages and the public realm of Carmanhall Road and Blackthorn Road which will be integrated with the proposals for the Sandyford Business District Pedestrian and Cycle Improvement Scheme (Figure 2).

The landscape design proposed for the Development includes communal landscaped space with a central courtyard (i.e. ‘podium garden'), lawns, outdoor formal and informal play areas, a barbeque area, outdoor exercise areas, and walkways. Outdoor amenity space is also provided at roof level on Block G. The design of these elements included consideration of the wind, microclimate, daylight and shading conditions resulting from the proposed development, as well as overlooking and security.

The Landscape Plan includes proposals for retention of some existing trees, tree planting, herbaceous planting, and planting of wildflower verges on the DLRCC-owned verges to the north and east of the site, along Carmanhall Road and Blackthorne Road respectively, subject to prior approval from DLRCC.

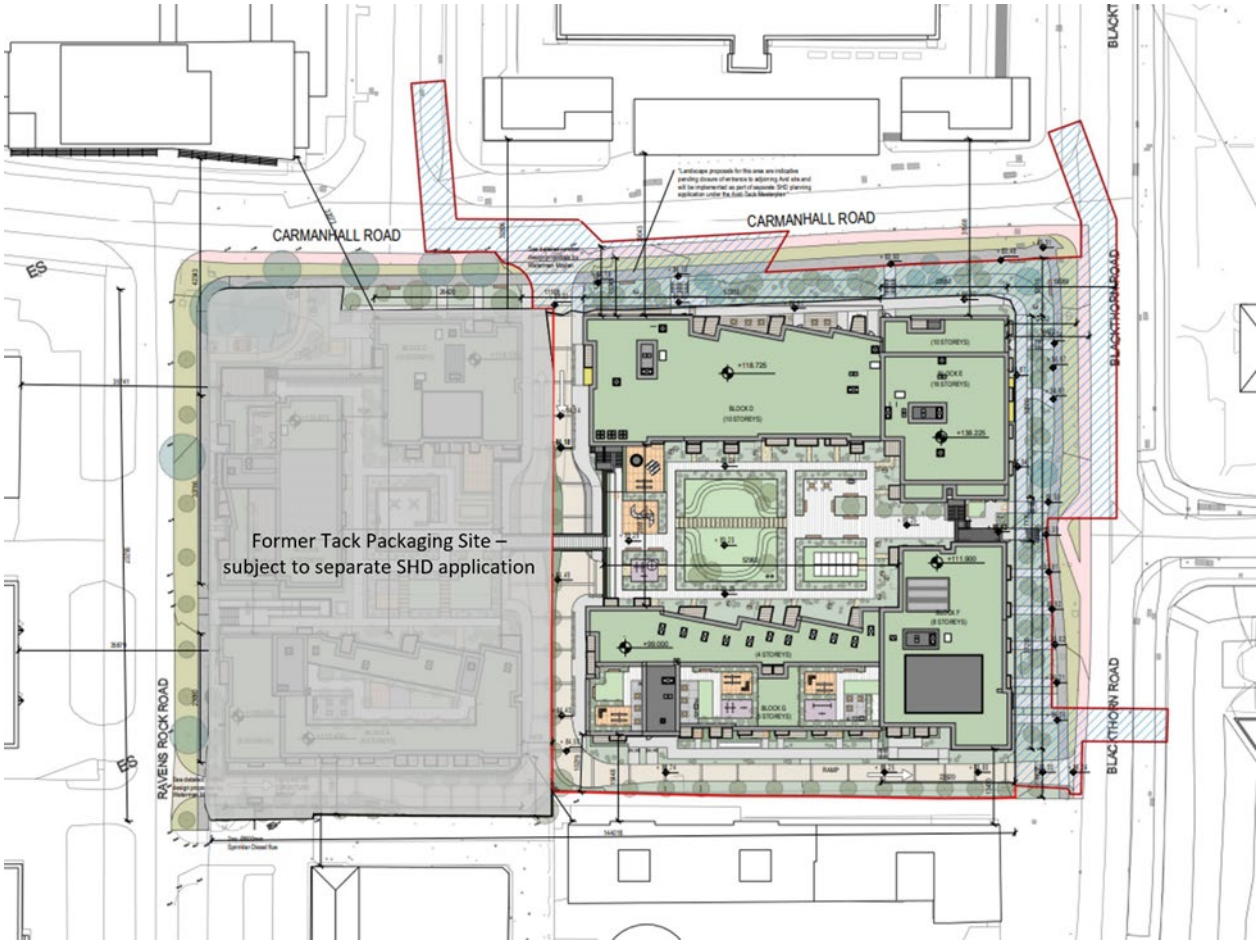

Figure 2: Layout of the Proposed Development

The building height of the Proposed Development ranges from four to sixteen storeys. Roof, communal terraces and roof garden heights will vary across the Proposed Development depending on the number of storeys and location. The total height of the tallest element of the proposals, located along Carmanhall Road, at the northeast of the Application Site, will be ca. 139.25 mOD (see Figure 3). The apartment blocks are designed to be tallest facing the central courtyard and step down towards the site boundaries.

The massing of buildings has been broken down into smaller volumes via vertical splits, material alteration, setbacks of building lines and stepping of building heights. These measures are intended to minimise the visual impact of the blocks whilst creating generous, outdoor terraces for communal use.

Figure 3: Building Height at tallest part of Proposed Development (North-East Elevation). MDO Architects

2.2 Relationship between Proposed Development and Wider Masterplan

McCauley Daye O'Connell (MDO) Architects have developed a masterplan for the Application Site and an adjacent site to the west, which is the former Tack Packaging site. A separate SHD application has been prepared for the former Tack Packaging site, known as the 'Tack Sandyford SHD', which is identified below (see Figure 4) in an image of the Masterplan for the two sites. It is important to note that a separate EIAR has been submitted with a planning application for the proposed Tack Sandyford SHD. The EIAR for the Proposed Development considers the potential for cumulative effects with the proposed Tack Sandyford SHD, where appropriate.

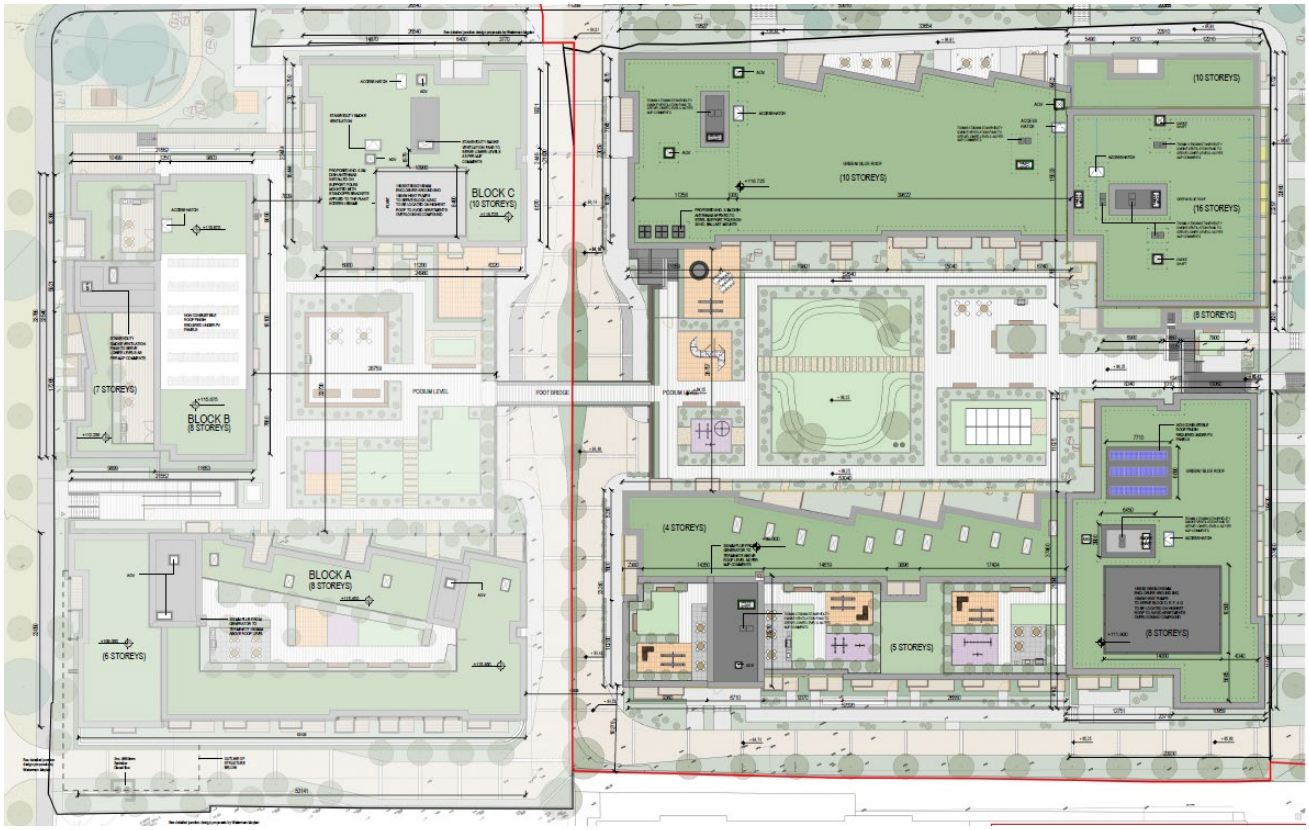

Figure 4: Proposed Tack Sandyford SHD development (L, faded) and proposed Carmanhall Road SHD 2022 development (R) complementary masterplan.

2.3 Proposed Development Construction

2.3.1 Construction Duration

It is anticipated that the construction of the Proposed Development will be conducted in a single phase over a period of approximately 24 months, from the start of the construction works to final completion. Should the current SHD application and the SHD application for the adjacent proposed Tack Sandyford SHD be successful, the two sites would be developed in tandem in a single phase also of approximately 24 months. It is expected that a detailed Construction Programme will be prepared by the main contractor for the works.

The proposed sequencing of the construction phase of the Proposed Development is as follows:

- Initial set-up of Site, including security and construction compound;
- Identifying and locating above and below ground utilities and services at the Site and its surroundings;
- Removing limited on site vegetation;
- Site preparation, including the stripping of soils, tarmac/asphalt surfaces, segregation, stockpiling and export from site;
- Development of the Proposed Development's foundations and substructure. Activities at this stage include the use of rebar, concrete formwork and pour;
- Development of the Proposed Development's superstructure. Activities at this stage include the use of rebar, concrete formwork, pour and blockwork;

- Construction of the superstructure's external envelope and façade;
- Internal finishing, including the mechanical and electrical fit out; and
- External landscaping, including roof top gardens and perimeter planting.

It is anticipated that no driven (percussive) piling will be undertaken. Secant piling are expected to be required around the basement construction and will be installed by rotary methods or by Continuous Flight Auger methods (CFA) of piling.

2.3.2 Construction Management

Operational plans including a Construction Management Plan (CMP), Construction and Environment Management Plan (CEMP), Construction Demolition Waste Management Plan (CDWMP), and Resource Waste Management Plan (RWMP) have been prepared to accompany the SHD Application. These documents set out obligations and controls and will be developed by the Main Contractor. Additionally, the Main Contractor will be required to prepare a comprehensive traffic management plan for the construction phase (Construction Traffic Management Plan).

In accordance with the DLRCC County Development Plan (CDP) 2022-2028, the working hours of the construction site would be: 07h00 hours to 19h00 hours Monday to Friday; and 08h00 hours to 14h00 hours on Saturdays. No work will be carried out on Sundays or bank holidays and the Site will remain secure when construction is not taking place. No work, or other activity that could reasonably be expected to cause annoyance to residents in the vicinity (including deliveries), will take place on site between 19h00 hours and 08h00 hours.

Special construction operations may be identified by the Main Contractor as the Project progresses and may need to be carried out outside these hours to minimise disruption to the surrounding area. The Main Contractor will consult on and agree such construction operations with DLRCC in advance.

2.4 Need for the Proposed Development

The Department of Public Expenditure and Reform's 2018, National Development Plan (NDP) 2018-2027 identifies that the population of Ireland is expected to grow by over 1 million to 5.7 million people by the year 2040. The NDP also recognises the urgent requirement for a major uplift of the delivery of housing within existing built-up areas of cities. The NDP notes there should be a particular focus on previously built land development which targets derelict and vacant sites that may have been developed before but have fallen into disuse.

The Department of Housing, Planning and Local Government published the 'Project Ireland 2040 - National Planning Framework' policy document in 2018. This Framework seeks a more balanced and concentrated growth, particularly within the five major cities in Ireland. Strategies included in the above mentioned Framework will seek to target a greater proportion (40%) of future housing development to be within and close to the existing 'footprint' of built-up areas. This target is to be achieved by developing underutilised land and buildings with higher housing and jobs densities, better serviced by existing facilities and public transport; such as Sandyford as per the following commentary from the Project Ireland 2040 document:

> *'A major new policy emphasis on renewing and developing existing settlements will be required, rather than continual expansion and sprawl of cities and towns out into the countryside, at the expense of town centres and smaller villages. The target is for at least 40% of all new housing to be delivered within the existing built up areas of cities, towns and villages on infill and/or brownfield sites. The rest of our homes will continue to be delivered at the edge of settlements and in rural areas'.*

The DLRCC County Development Plan 2022-2028 prescribes the Core Strategies for the medium to long term for the various towns, villages and rural areas within the overall administrative area. The central focus of the

Core Strategy is on residential development and in ensuring that there is an acceptable balance between the supply of zoned, serviced land for residential development and the projected demand for new housing, over the lifetime of the Plan. The project accords with Objective A2 of the newly adopted DLRCC County Development Plan 2022-2028 for Land Use Zoning, which denotes areas to provide for new residential communities and Sustainable Neighbourhood infrastructure in accordance with approved local area plans. DLRCC have identified Specific objectives in relation to the creation of Sustainable Residential Neighbourhoods, that preserve and protect residential services. The Application Site is covered by Specific Local Objective 52 in the Sandyford Urban Framework Plan, which forms Appendix 17 of the DLRCC County Development Plan 2022-2028. The objective seeks to facilitate the provision of a community facility at ground floor level along the eastern outer edge of the Carmanhall Residential Neighbourhood, along Blackthorn Road, within the Application Site.

The purpose of the Proposed Development is to provide a high-density residential development with residential and local community amenity spaces within the environs of the Sandyford Industrial Estate. It is designed to 'provide for the creation of sustainable residential neighbourhoods and preserve and protect residential amenity' which is the applicable A2 zoning objective for the lands. It is considered that the extent of Proposed Development allows for the efficient use of the site with the associated amenities provided at ground floor level and providing an active frontage for the benefit of the adjoining public realm along Carmanhall Road and Blackthorn Avenue.

2.5 Alternatives and 'do-nothing' option

Annex IV (2) of the EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), identifies that all Environmental Impact Assessment Reports should include:

> *'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'*

This section outlines the potential Project alternatives that have been considered in relation to environmental, planning and development factors of the Carmanhall Road SHD 2002.

The principal alternatives assessed during the design and planning of the Proposed Development were alternative design layouts for a residential development at the Application Site. The following subsections include consideration of previous alternative development, alterative location, alterative technology/processes, alternative design of development and size and scale (including height of the blocks), alternative phasing of development, and alternative mitigation measures. The 'do nothing' alternative is also considered.

2.5.1 Previously Granted Alternative Development

There are three previously granted alternative developments which were consented for the Application Site since 2016. These are:

- **ABP Ref: ABP-310104-21** – Permission refused by An Bord Pleanála on 30 April 2021 for a Build-To-Rent residential development within a new part six, part eight, part nine, part eleven storey rising to a landmark seventeen storey over basement level apartment building (40,814 m^2) comprising 428 no. apartments (41 no. studio, 285 no. one-bedroom, 94 no. two-bedroom and 8 no. three-bedroom units) of which 413 no. apartments have access to private amenity space, in the form of a balcony or lawn/terrace, and 15 no. apartments have access to a shared private roof terrace (142 m^2) at ninth floor level
- **ABP Ref. 303467-19** – Permission granted by An Bord Pleanála on 30 April 2019 for a student accommodation development comprising the construction of 122 no. apartments, providing 817 no. student bed spaces, with associated residents' facilities (inclusive of 101 m^2 entrance/reception; 297 m^2 gym;

119 m^2 café/lounge and 85 m^2 laundrette) in 1 no. block of 7-9 storey height with 57 no. vehicular and 586 no. cycle parking spaces.

- **Reg. Ref. D16A/0158** – Permission granted by Dun Laoghaire-Rathdown County Council on 01 September 2016 for a development comprising the demolition of existing buildings and the construction of 147 no. apartments with associated residents' facilities (inclusive of 216 m^2 crèche; 46 m^2 gymnasium; 93 m^2 media suite; and 141 m^2 café) in 2 no. blocks of 5-8 storey height with 151 no. vehicular and 158 no. cycle parking spaces.

The proposed development has been designed to address previous feedback from An Bord Pleanála and Dun Laoghaire Rathdown under decision ABP-310104-21 (former Avid site) (MacCabe Durney Barnes Planning and Development Consultants, 2022). With regards An Bord Pleanála's decision to refuse the 2021 application, this current planning application has been composed to specifically address the following items:

1) Having regard to the proposed quantum and resulting form of development, in particular the enclosed nature of the scheme layout and height on this restricted site (i.e. substandard quality of communal open space, inadequate range and extent of resident support facilities and amenities serving the entire development).

2) That the proposed development would materially contravene the height and density provisions of the Dun Laoghaire-Rathdown County Development Plan 2016-2022, including the Sandyford Urban Framework Plan, by failing to meet the criteria set out in Section 3.2 and Specific Planning Policy Requirement 3 of the Urban Development and Building Height Guidelines for Planning Authorities.

The current Proposed Development differs from the 2019 application in that private residential accommodation is now proposed in place of student accommodation. The current Proposed Development retains the provision of ancillary communal facilities, with an extent of shared communal/community infrastructure facilities, to present a range of active uses at ground floor level to the adjoining streets.

It is considered that the Proposed Development provides additional positive social effects in relation to the previous planning applications through its increased efficiency in use of the Site and its size and scale. Furthermore, the Proposed Development is designed to provide a high standard of accommodation and amenity for future occupants and the local community.

The current proposal comprises a multi-storey over basement building and is considered appropriate on the basis of the accessibility to high-quality public transport links. The building is to be sited within a prominent location in the context of Sandyford Industrial Estate and will contribute to the urban character and public realm quality of the immediate surrounds through attractive visual design.

A further development (Reg. Ref. D05A/0239) was consented on 28 July 2005 for a development comprising the demolition of existing buildings and the construction of 265 no. apartments and 2,175 m^2 of ground level retail/commercial floorspace in 4 blocks of 3-13 storey height with 337 no. vehicular and 348 no. cycle parking spaces. It is considered that there are significant changes in Irish society behaviours and national objectives since the consent of this Project in 2005; such as the economic downturn after 2008 and the more recent pressure on national housing stock and improvements in infrastructure such as roads, rail transport and services.

2.5.2 Alternative Location

Alternative locations for the Proposed Development were not considered during the development stage of this Project. The justification for this is owing to the zoning and residential objectives for the Site identified in the DLRCC Sandyford Urban Framework Plan 2022-2028 (Appendix 16) which align with the use of the Site for

residential purposes and the DLRCC Sandyford Urban Framework Plan 2022-2028 was subject to and informed by a Strategic Environmental Assessment.

Furthermore, there are positive environmental effects in the development of a brownfield site when compared to developing a greenfield site elsewhere. This rationale is mirrored in the focus of the Project Ireland 2040 - National Planning Framework, and NDP 2021-2030.

Therefore, the scale and nature of the Proposed Development is considered appropriate for the Application Site and its regional and local location.

2.5.3 Alternative Technology/Processes

Given the nature of the Project (residential) and the rationale for the Proposed Development, reasonable alternative technologies or processes were not assessed. However, an energy analysis was carried out by IN2 as part of the development design and is submitted within the SHD Application.

The energy analysis was undertaken to demonstrate compliance to relevant building regulations, technical guidance, and the EU Directive for Near Zero Energy Buildings (NZEB). The report then examines the methodology in terms of Primary Energy, Renewable Technologies, and the alternatives between Centralised and Decentralised plant. The report illustrates how electrically based technologies (Air Source Heat Pumps, Photovoltaic panels etc.) are increasingly favoured options and that the centralised system provides versatility to pursue other technologies so the building can meet future benchmarks or carbon target.

Waterman Moylan carried out a Sustainable Urban Drainage Systems (SuDS) Assessment for the Proposed Development to inform the surface water drainage design. This assessment is submitted within the SHD application pack. SuDS collectively refers to surface water drainage methods that take account of quantity, quality and amenity issues. Issues that may have been overlooked, or considered in less detail, with more traditional design approaches to surface water management. They are typically made up of one or more structures, built to manage surface water run-off though source control (e.g. conveyance and infiltration of run-off) or site control (e.g. reduction in volume and rate of surface run-off, with some additional treatment provided). The assessment considered the use of all appropriate SuDS measures as part of the site SuDS strategy and was carried out by in compliance with the requirements of the DLRCC County Development Plan 2022-2028, the guidelines set by the Greater Dublin Strategic Drainage Study (GDSDS) and CIRIA documents. SuDS Measures proposed include permeable asphalt, green roofs/green podium, filter drains, attenuation tank and hydro-brake, petrol interceptors, bio-retention tree pits, and rain gardens.

2.5.4 Alternative Design of Development and Size and Scale

By email correspondence dated 29th November 2021, Dun Laoghaire Rathdown County Council Planning Department advised that a section 247 meeting would not be facilitated and the applicant could proceed to lodge a Pre-Application Consultation request with An Bord Pleanála (the Board).

A tripartite pre-planning meeting took place, under the provisions of Section 5 of the Planning and Development (Housing) and Residential Tenancies Act 2016 between the Applicant, the Board, and Dún Laoghaire Rathdown County Council in relation to the Proposed Development on 27 April 2022. The following issues were discussed:

- Density;
- Scope of planning application and relation with adjoining Tack site;
- Masterplan;
- Planning permission (expired);
- Density;

- Height;
- Civil engineering;
- Sandyford Urban Framework Plan policies;
- Creche;
- Residential amenity space; and,
- Access and parking.

Following this, the Board issued an Inspector's Report outlining issues for further consideration and amendment in order to constitute a reasonable basis for an SHD application for the Proposed Development. The pre-planning consultation process facilitated an addition design review opportunity which took into account the feedback of a range of departments within the planning authorities. This SHD application is made pursuant to An Bord Pleanála's Pre-Application Consultation Opinion of 19th May 2022 under Ref. ABP-312265-21.

The proposed development has also been designed to address previous feedback from An Bord Pleanála and Dun Laoghaire Rathdown under PAC Reference ABP-308186-20 (former Tack Packaging site). This is considered to be appropriate as the two separate planning applications were conceived as co-ordinated and complementary SHD planning applications in association with Sandyford Environmental Ltd. for the adjoining Tack Site, prepared by the same design team.

Environmental considerations have been incorporated at the core of the design with weekly design team meetings being held to ensure that feedback from all the environmental specialists would be continually taken into the evolution of the proposals. The proposed design of the lower ground floor and basement elements of the proposals has been responsive to existing level differences, seeking to reduce the need for excavation and disposal of material from the Site. Opportunities to enhance the environmental value of the Site have been sought through the incorporation of embedded mitigation measures as set out in each of the technical chapters. The Proposed Development itself seeks to be a coherent response to enhance brownfield land use, maximising its potential for residential and communal use and designing for positive wind microclimate and daylighting/sunlighting relationships with neighbouring buildings).

2.5.4.1 Alternative building height

In the evolution of the design of the proposed scheme, has considered the alternative of including a medium height block as part of the scheme. From a design perspective, a strong rationale is presented in the siting of the taller block of 16 storeys at the corner of Carmanhall Road and Ravensrock Road. The Sandyford Urban Framework Plan 2022-28 envisages that block should have a height of 9 storeys. However, national planning policy and guidelines consider it is appropriate to locate high density developments in sustainable urban locations.

It is therefore important that the EIAR considers the height alternative is duly considered under key environmental criteria; namely micro-climate, daylight/sunlight and visual assessment. This alternative provides consideration whether the 16 storey block has a potential impact on communal space, residential amenity, adjoining sites and micro-climatic effects.

In the context of strategic policy, Project Ireland 2040 - National Planning Framework (2018), the location of higher residential buildings is appropriate in close proximity to the Luas light rail stop and significant employment opportunities in the Sandyford Business District. National Policy Objective 11 states 'there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth.'

National Policy Objective 13 considers that high buildings are appropriate in urban areas providing the environment is suitably protected. The Guidelines on Sustainable Development in Residential Urban Areas Urban Development (2009) and Building Height Guidelines for Planning Authorities (2018) also set out relevant policy criteria that support higher densities and height in appropriate locations. Housing for All – A New Housing Plan for Ireland (DHLGH 2021) stresses it is government policy to Increasing New Housing Supply in all residential sectors.

The Architectural Design Statement (prepared by MDO Architects) notes '*The design as proposed reinforces the existing street pattern creating legible well defined public and private spaces, responds to the existing and proposed development and creates a design with variety of form and scale by varying the height and form of the buildings. This design is composed of seven (five individual) blocks arranged around an open central landscaped courtyard, one of the blocks is 4/5 storeys to provide required sunlight into the communal courtyard, three of the buildings are 6/8 storeys, two are 8/10 storeys (some with mezzanine) and one of 8 stepping up to 16 storeys to create a taller building element at the street corner, similar to the previously granted permission on this site. The design celebrates the corner of Ravens Rock Road and Carmanhall Road, formed by the pocket park, punctuates this corner and creates an identity, interest and variation in the heights of the urban forms*.'

The MDO statement further highlights "The form of the building has been designed and modulated to maximise the daylighting, views and amenity and permeability within the development, in the apartments, the courtyards and roof terraces."

In terms of visual impact the height has been considered by Macroworks in EIAR Chapter 13, 'Landscape and Visual'. In terms of micro-climate, a detailed analysis by Bfluid is in EIAR Chapter 12, 'Wind Microclimate'. The effects of sunlight and daylight of this alternative has also been considered in detail by IN2 in the Sunlight and Daylight Assessment that was prepared in accordance of the requirements of An Board Pleanala's Opinion and is submitted within the SHD application pack.

2.5.5 Alternative Phasing of Current Development

The Proposed Development is expected to be constructed in one phase over approximately 24 months.

Given the scale of the Application Site's area, completing the entire development in a number of phases would not be a practical alternative. An alternative approach to phasing has been considered in terms of the potential to develop the adjacent former Tack Packaging Site in tandem with the Proposed Development as part of the proposed masterplan with the Tack Sandyford SHD. In either scenario (assuming relevant planning permission is obtained), it is anticipated that the most environmentally and economically advantageous option would be to carry out development in a single phase, thereby not introducing new receptors within construction areas.

This approach to the development's construction provides benefits through efficient environmental management of the single construction phase.

2.5.6 Alternative Mitigation Measures

The mitigation measures identified in the chapters of the EIAR and consolidated in EIAR Chapter 16 'Mitigation and Monitoring Measures' are deemed appropriate for the Proposed Development. Limited consideration to alternative mitigation was given as the measures represent commonly employed best-practice for similar developments.

2.5.7 'Do-Nothing' Alternative

Given the specific local area objectives for the Site, if the Application Site was not developed (i.e. the 'Do-Nothing' Alternative), it is assumed that it would remain as an undeveloped vacant site. It is considered that the potential negative environmental impacts would be nil and the current baseline conditions would prevail. The socio-economic benefits of the Proposed Development, however, would not be realised and the need for this

Project, in line with the requirements of the County Development Plan and the Sandyford Urban Framework Plan would not be met. Should the Application Site become occupied by a replacement commercial user it would represent an opportunity for low density use of the Site with limited opportunities for employment creation and landscaping.

Failure to develop the Application Site has a potential negative impact on the regional and local planning objectives, therefore a 'No Project' alternative is not considered to be a reasonable alternative.

Should the Site not be developed in this central location within the Sandyford Business Park it would likely result in residential units being located further from the Business District, and potentially on lands with fewer surrounding services and amenities. This would have negative impacts in terms of spatial pattern and distribution and may add to the exacerbation of traffic and transportation on key commuter routes to the area.

2.6 Major Accidents and Disasters

It is required by the EU EIA Directive that an assessment is made to 'the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned'. The EIAR sets out an assessment of potential vulnerability to major accidents and disasters at the Application Site, and potential for such to arise as a result of the Proposed Development. No likely risks of a major accident or disaster have been identified in respect of the Proposed Development.

3.0 SCOPE AND METHODOLOGY

3.1 EIA Context

EIA is a process undertaken for certain types of development. It provides a means of drawing together the findings from a systematic analysis of the likely significant environmental effects of a scheme to assist planning authorities, statutory consultees and other key stakeholders in their understanding of the impacts arising from the development.

The aim of EIA is to protect the environment by ensuring that when a responsible authority decides whether to grant permission for a Proposed Development, which is likely to have significant effects on the environment, it does so with full knowledge of the likely significant effects. It is then able to take these into account in the decision-making process. The Carmanhall Road SHD 2022 EIAR is submitted to An Bord Pleanála ('ABP'/ 'the Board') in support of the SHD application, in order to assist the Board in its own EIA for the Proposed Development.

The aim of EIA is also to ensure that the public are given early and effective opportunities to participate in the decision-making procedures.

A review of the Planning and Development Regulations (2001, as amended) Schedule 5 Part 1 thresholds (Developments for the purposes of Part 10), indicates that the Proposed Development is not of a size which requires a mandatory EIA.

Furthermore, with regards to Schedule 5 Part 2 of the Planning and Development Regulations (2001, as amended) the Proposed Development is not classified as an Infrastructure Project under Class 10, as it: comprises less than 500 dwelling units, (Class 10(b)(i)); and it does not involve an area greater than 2 hectares within a business district, (Class 10(b)(iv)). Schedule 7 has been consulted insofar as it sets out the criteria for determining whether development listed in Part 2 of Schedule 5 should be subject to an environmental impact assessment. To this end, Schedule 7 considers character and location of the proposed development as well as the types and characteristics of potential impacts.

Notwithstanding the above thresholds and having regard to the specific characteristics and nature of this site, its size, and the quantum of development proposed, an EIAR has been prepared on a precautionary basis to

accompany this SHD application to the Board. An EIA scoping process determined that the following topics would be covered in the EIA, as it was considered that there was potential for significant environmental effects to arise as a result of the Proposed Development:

- Population and Human Health;
- Ecology and Biodiversity;
- Land, Soils and Geology;
- Water;
- Air Quality and Climate;
- Noise and Vibration;
- Cultural Heritage;
- Traffic and Transport;
- Landscape and Visual;
- Wind Microclimate;
- Material Assets;
- Major Accidents and Disasters; and
- Interactions, Cumulative and Combined Effects.

The EIA has been prepared in line with relevant legislation and national and international guidance and the methodology followed by each of the technical environmental specialists is set out within the EIAR. In accordance with Article 5(3)(a) of the EIA Directive, ('the developer shall ensure that the environmental impact assessment report is prepared by competent experts'), the chosen EIA project team are deemed "competent experts" and their credentials are set out in the EIAR.

3.2 Legislation and Appropriate Guidance

EIA is a process undertaken for certain types of development. It provides a means of drawing together the findings from a systematic analysis of the likely significant environmental effects of a scheme to assist planning authorities, statutory consultees and other key stakeholders in their understanding of the impacts arising from the development.

The requirement for an Environmental Impact Assessment process arises from European Union (EU) Directives required to be adhered to by member States and transposed into national laws. This EIAR has been produced in accordance with the relevant legislative requirements and Statutory Instruments.

The European Union's 1985 EIA Directive (85/337/EEC) was amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC, and the Directive and its amendments were codified in 2011 by Directive 2011/92/EU. The current Directive 2014/52/EU amends the 2011 codified Directive but does not replace it.

This amending Directive was transposed into national planning consent procedures in September 2018 through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

The following is stated by the Department of Housing, Planning and Local Government in the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (August 2018):

'The objective of Directive 2011/92/EU, as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being given, of public and private developments that are likely to have significant effects on the environment.'

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU) prescribes a range of environmental factors which are used to organise descriptions of the environment and these factors must be addressed in the EIAR. Article 3(1) of the EIA Directive states that:

The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

a) Population and human health;

b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

c) Land, soil, water, air and climate;

d) Material assets, cultural heritage and the landscape;

e) The interaction between the factors referred to in points (a) to (d).

The EIAR for the proposed Carmanhall Road SHD 2022 has been undertaken with regard to the above referenced legislation and also with the following guidance:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022).

The classification of effects and their significance has also been carried out based on the above materials (with some modifications to increase clarity) unless this is otherwise stated within the relevant section or chapter.

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government, 2018).
- Environmental Impact Assessment of Projects Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU). European Commission of the European Union 2017.

Topic-specific guidance was used in specialist assessments, where appropriate.

3.3 EIAR Contributors and Demonstration of Competency and Independence

The EIAR was completed by a project team led by Golder, who also prepared a number of the chapters. In accordance with the EIA Directive. Table 1.2 in EIAR Chapter 1, Introduction, sets out the names of lead specialists for each discipline with a summary of their experience, qualifications and professional accreditations. Each expert has extensive proven expertise in the relevant field concerned, thus ensuring that the information provided herein is complete and of high quality.

3.4 EIAR Processes

The EIAR process involves:

- Determining the Key Features of the Proposed Development;
- Determining the Baseline; and

- Prediction of Impacts and Effects and Development of Mitigation Measures[1], including:

1) Determining the Extent of the Assessment, including the geographical and temporal extent.

2) Prediction of Impacts and Effects Prior to Mitigation.

3) Design and Mitigation (incorporated mitigation measures using a hierarchical system prioritising in the following order: 'Avoidance and prevention', 'Reduction', and 'Remediation'. Any enhancement measures are also described, as well as any requirements for monitoring of mitigation measures associated with any significant environmental effects).

4) Prediction of Residual Impacts and Effects.

5) Interactions between disciplines and in-combination and Cumulative Effects from the project itself or different projects.

The cumulative effects of the project have been assessed with the development of the separate Tack Sandyford SHD development adjacent to the application Site as part of an overarching masterplan development. The assessment considers that, should both SHD applications receive approval to proceed, it is intended that the construction and operational phases for both the Carmanhall Road SHD 2022 development and Tack Sandyford SHD development will run largely in parallel.

4.0 POPULATION AND HUMAN HEALTH

The Population and Human Health chapter describes the human environment and identifies and assesses any construction and operational related impacts from the activities on lands located on the Site and within a wider 'zone of influence', as predicted impacts on the human environment can extend beyond the immediate Site boundary. The human environment and potential impacts on the 'quality of life' as a consequence of the Proposed Development are examined under the following headings:

- Populations and social patterns;
- Economic patterns (activity and employment);
- Amenity;
- Land-use;
- Human health; and
- Health and safety.

Impact Assessment and Mitigation

Populations and social patterns

Construction phase

Employee numbers associated with the construction phase of the Proposed Development will depend on construction methods, phasing and the main contractor's final construction plan. However, it is anticipated that the construction phase will provide for the temporary employment of ca. 250-350 construction staff as the project progresses.

[1] For several topic areas, forecasting methods have been developed by professional bodies. Where these are available, they have been used in this EIAR, as appropriate. For topics where there is no topic specific guidance available, a common framework of assessment criteria and terminology has been used based on the EPA's 2022 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'.

Local population growth in the Dundrum-Balally ED based on the number of construction workers who will move to and reside there during the temporary construction phase is considered to be very low, with a resultant impact that is negligible. It is anticipated that workers will travel from existing population centres in the Greater Dublin Area. Therefore, there is anticipated to be negligible potential for growth in local population due to the construction phase.

The local population of the Dundrum-Balally ED are valued with a 'High' sensitivity. The magnitude of impact is considered to be 'Negligible' and 'Beneficial'. This has resulted in a *Slight* significance in the short-term (one - seven years), which is an effect which causes a noticeable change in the character of the environment without affecting its sensitivities.

Similarly, it is considered that there will be a 'Negligible' and 'Beneficial' effect on other population factors such as population age distribution, population density, household composition or commuting patterns as a result of the construction phase of the Proposed Development, thereby resulting in a *Slight* significance of impact in the short-term (one - seven years).

Relevant mitigation measures relating to Population and Human Health in the context of environmental factors have been assessed in separate chapters in this EIAR. The potential impacts arising during the construction phase can be addressed by good construction practices and mitigation measures which have been defined in the development's Construction Environmental Management Plan and Construction Management Plan.

No specific mitigation measures are deemed necessary to protect local populations and population dynamics.

Operational phase

During the operational and occupational phases of the Proposed Development it is considered that the creation of 334 residential dwelling units and public and communal open space in the Proposed Development will have a positive effect on the local population. The population and local community receptor are valued with a 'High' sensitivity, and it is considered that the magnitude of impact is 'Low'. The inclusion of public space in the Proposed Development has advantages in terms of creating areas of the development that can be used by the wider local area. Given the balanced approach and public aspects it is considered that there are minor beneficial socio-economic effects. This results in a *Slight* permanent significance, which is an effect which causes a noticeable change in the character of the environment without affecting its sensitivities.

Operational effects associated with population age distribution, household composition and commuting patterns of the Dundrum-Balally ED ('High' sensitivity receptor) will be 'Negligible' and 'Beneficial'. It is considered that changes in these population factors will be consistent with emerging baseline trends within the ED, and will have a Slight effect.

Given the beneficial effects identified, no mitigation measures are considered to be required to protect local populations and population dynamics from potential impacts.

Economic patterns

Construction phase

The construction phase of the development will provide short term, beneficial effects in local economic activity through the creation of direct employment in the construction sector. Construction workers will be directly employed at various stages of the Proposed Development's approximately 24-month construction phase. The construction of the development will also service indirect employment in the local construction industry and local community.

The local businesses which may be affected are considered to have a 'Low' sensitivity. It is considered that the magnitude of impact is also 'Low', as there will be minor socio-economic effects, and such impacts will only

have an effect on a limited number of businesses or workers. This results in a *Slight* short-term beneficial effect for the local economy where effects are noticeable short-term change in the character of the environment without affecting its sensitivities; and will have beneficial local effects.

Given the potential beneficial effects on the local economy and employment during the construction stage no mitigation measures are deemed to be required by the subject site during the assessment period.

Operational phase

The Proposed Development will provide 334 residential units. The increase in residents will result in the contribution of additional revenue to the local economy through these residents' demand for local services. The provision of additional accommodation within the Sandyford Business district (SBD) will also have indirect benefits for the SBD as an employment centre.

The local businesses which may be affected are considered to have a 'Low' sensitivity. It is considered that the magnitude of impact is 'Medium'; which is higher than that identified during the construction phase as the greater demand for services will be from the new residential population who will be based within the Site. This results in a *Slight* permanent beneficial effect for the local economy (noticeable change in the character of the environment without affecting its sensitivities; and will have beneficial local effects).

The increased population at the Proposed Development will support businesses in the local economy. Therefore, as a result of the beneficial permanent effects no mitigation measures have been proposed.

Local Services and Amenity

Construction phase

During the construction phase of the development potential impacts to local amenity, services and recreation areas surrounding the development may result from noise, construction dusts (from site activities and bare ground) and associated construction traffic.

Mitigation measures related to the management of nuisance dusts and noise have been discussed in EIAR Chapter 8 (Air Quality and Climate) and Chapter 9 (Noise and Vibration). Potential negative effects have been identified in these assessments to be short-term in duration and 'not significant' in nature once the appropriate mitigation measures have been implemented during the construction process.

The impacts of construction traffic have been assessed in EIAR Chapter 11 (Traffic and Transport). The construction traffic will have a not significant impact on the local road network and will be directed via designated construction traffic routes using the regional road network. The Main Contractor's construction phasing and final Construction Traffic Management Plan will seek to minimise the impact on local residents and will ensure that the adjoining road network remains operational at all times.

Relevant mitigation measures for the impacts of the development's construction phase on local services and amenities in the context of environmental factors have been assessed in separate chapters of this EIAR. The potential effects arising during the construction phase can be addressed by good construction practice and mitigation which has been defined in the development's Construction Environmental Management Plan (CEMP).

Operational phase

During the operational phase the Proposed Development will include a public space which will provide additional amenity to the local area. This will result in beneficial effects on the local population and community. Existing services and amenities within the SBD and surrounding area will benefit from the increase in population at the Proposed Development.

The local amenity which may be affected is considered to have a 'Low' sensitivity. It is considered that the magnitude of impact is 'Medium'. This results in a Slight permanent beneficial effect for local amenity (noticeable change in the character of the environment without affecting its sensitivities; and will have beneficial local effects).

The increased population at the Proposed Development will support local amenity. Therefore, as a result of the beneficial permanent effects no mitigation measures have been proposed.

Land use

Construction phase

The construction phase of the Proposed Development will consist of site clearing, excavation and construction works, and has the potential to impact adversely and result in the temporary degradation of the local environment on a short-term basis. These potential impacts have been assessed in the respective chapters of this EIAR. Construction works will take place in accordance with an agreed CEMP.

Construction works will take place in accordance with the CEMP submitted with this SHD Application; and also, in accordance with a final Construction Management Plan (CMP) to be agreed by DLRCC and the appointed Main Contractor. A preliminary Construction Management Plan (pCMP) has been completed for this SHD application for the Proposed Development. Ultimately, this pCMP will evolve into the finalised Construction Management Plan (CMP) to be prepared by the Main Contractor.

Given the short-term nature of the land-use changes during the construction phase, and the requirement of this phase to achieve the operational/occupational goal, it is considered that there will be a 'Negligible' and 'Adverse' impact on the current unoccupied lands, which have a 'Low' sensitivity land use. This will result in an Imperceptible effect during the construction phase.

The CEMP will set out the Contractor's overall management and administration of the construction project with regards to environmental impacts. The CEMP is an evolving document and is initially prepared during the pre-construction phase. The CEMP is then amended to incorporate commitments included in the statutory approvals and then during the construction phase where the effectiveness of site management practice can be reviewed and included. The Construction Management Plan that will be implemented by the Main Contractor will includes working methods, in particular in relation to traffic, which will protect local land uses as appropriate.

Operational phase

National and local government planning policy performs an important role in guiding and facilitating changes in land-use which can influence settlement patterns, thus affecting populations. Planning policy ensures these changes are appropriate to the existing and emerging social, economic and environmental conditions of a given area. The primary consideration relating to land-use change is whether the Proposed Development conforms with land-use policy in the DLRCC County Development Plan 2022-2028. A Planning Report and Statement of Consistency has been prepared by MDB Planning and is submitted with this SHD application, which provides a detailed review of the Proposed Development and how it relates to planning policy.

As identified, the DLRCC Development Plan (2022-2028) defines the Site as 'Objective A2' lands, which are lands to '*provide for the creation of Sustainable Residential Neighbourhoods, and preserve and protect residential amenity in Zone 5 of the Sandyford Business District*'. The nature and composition of the development are considered to be sustainable and will provide residential amenity within the area.

Additionally, A Specific Local Objective, SLO 52, has been included in the Sandyford Urban Framework Plan 2022-2028 to facilitate the provision of a community facility at ground floor level along the eastern outer edge of

the Carmanhall Residential Neighbourhood, along Blackthorn Road (see Section 4.3.2 of DLRCC Development Plan 2022-2028 Appendix 16).

The provision and conformity of the residential land-use with the defined objectives for the Site are considered to have a 'High' sensitivity. It is considered that the magnitude of impact is 'Medium', and 'Beneficial'; owing to the nature of the development, resulting in the permanent change of the study area's baseline socio-economic conditions and higher density of development in comparison to the baseline or Do-Nothing scenario. This is considered a *Moderate* permanent beneficial significance for the land-use at the Site, given that is in keeping with recent development trends in the area as well as national and local objectives for the development of Sandyford.

The beneficial changes in land-use at the Proposed Development Site will support objectives in the DLRCC Development Plan (2022-2028). Therefore, as a result of the beneficial permanent effects no mitigation measures have been proposed.

Human Health

Construction phase and operational phase

1) Air Quality

Potential air quality impacts to human health from the Proposed Development have been assessed in Chapter 8 (Air Quality and Climate) of the EIAR. The factors relevant to human health considered in the assessment are the generation of construction dust, NO2, PM10 and PM2.5.

Construction Dust – For the construction phase, a qualitative assessment of dust impact (deposited dust and human health) has been undertaken in line with IAQM 'Guidance on the assessment of dust from demolition and construction' (IAQM 2014; EIAR Chapter 8 Air Quality and Climate, Appendix 8.1 Construction Dust Assessment). While dust deposition will arise from the deposition of dust in all size fractions, the ambient dust relevant to human health outcomes will be that measured as PM10. PM10 concentration in the vicinity of the development site may become elevated as a result of dust generating activities, including exhaust emissions from non-road mobile machinery and vehicles accessing the Site. The assessment identified that there are residential properties (high receptor sensitivity) located within 350 m of the development boundary, but due to their distance from the boundary these generate a low sensitivity classification. This classification takes a worst-case approach and assesses effects based on the closest (commercial and industrial) receptors within 20 m of the development boundary or the construction route. To define the risk of human health impacts, the assessment combines the dust emission magnitude with the sensitivity of the area to determine that prior to mitigation human health is low for earthworks, construction, and trackout activities associated with the Site. A 'Low' magnitude of impact has been attributed to the construction dust and will have no or a non-perceptible impact to the 'High' sensitivity populations or groups. This will result in a Slight short-term adverse effect.

Construction Traffic – With regards to emissions from construction traffic, due to the size of the development it is not anticipated that the maximum number of Heavy Duty Vehicle (HDV) (>3.5 tonnes) Annual Average Daily traffic (AADT) movements during the construction period, will be above the threshold (100 AADT) for a quantitative assessment of construction traffic referred to in the IAQM 2017 planning guidance (Table 6.2 of that guidance document) or the 200 HDV AADT screening criteria defined in the Design Manual for Roads and Bridges (DMRB) (LA105 Air Quality, 2019). A 'Negligible' magnitude of impact has been attributed to the construction traffic as it is below the screening threshold and will have no or a non-perceptible impact to the 'High' sensitivity populations or groups surrounding the development. This will result in a Slight short-term adverse effect.

Operational Traffic – A quantitative operational phase assessment of effects from road traffic emissions has been undertaken using the latest version (version 5.0.0.1) of CERC ADMS-Roads dispersion modelling software, in accordance with IAQM 2017 Guidance, to determine the potential effects of NO2, PM10 and PM2.5 at nearby sensitive receptors within the Air Quality Study Area. The assessment quantified total pollutant concentrations for the following scenarios:

- Scenario 001: 2022 Baseline;
- Scenario 002: Future 2026 Without Proposed Development; and
- Scenario 003: Future 2026 With Proposed Development.

With the Proposed Development in the future 2026 scenario all cases the predicted change in air quality concentrations of NO2, PM10 and PM2.5 is negligible. A 'Negligible' magnitude of impact of these concentrations will have no or a non-perceptible impact to the 'High' sensitivity populations or groups surrounding the development. This will result in a Slight adverse effect and therefore not significant.

The above air quality assessments have been carried out using appropriate guidance and methods. Effects which are determined to be not significant were identified for construction dust, NO2, PM10 and PM2.5 generated by the Proposed Development; it is therefore considered that further assessments of human health with regards to air quality are not required.

2) Noise and Vibration

Noise and vibration from construction activities at the Proposed Development can have indirect impacts to surrounding residential developments through annoyance and effects on mental health. Potential noise and vibration impacts from the Proposed Development have been assessed in Chapter 9 (Noise and Vibration) of the EIAR. The factors relevant to human health considered in the assessment are the generation of construction noise and impact at off-site receptors; and the impacts of noise at Noise Sensitive Receptors (NSRs) during the operational phase.

Construction Noise – NSRs were identified in the assessment, the closest residential receptor is located 100 m to the north of the Proposed Development. However, noise effects arising at off-site NSRs have been evaluated using Bloom Health (150 m west) as a worst-case proxy. Noise effects associated with the proposed construction activities during weekday daytimes and Saturday mornings have been evaluated against threshold noise levels which have been derived from measured baseline noise levels in accordance with BS5228. For these times a High adverse impact magnitude has been identified. However, with appropriate construction mitigation measures as outlined in Chapter 9 and Chapter 16 of this EIAR, it has been concluded that the short-term activities will result in a low magnitude impact to the 'High' sensitivity populations or groups surrounding the development. This will result in a Slight short-term adverse effect and is therefore not significant.

Operational / Occupational Noise – During the baseline noise survey, the dominant noise source across the Site was determined to be road traffic on Blackthorn Road, Ravens Rock Road and Carmanhall Road. Noise effects during occupation of the Proposed Development will therefore predominantly arise from road traffic. Predicted road traffic noise levels within proposed residential dwellings via closed-window transmission are evaluated against BS8233 target internal noise levels.

During the daytime and the night-time period, predicted noise levels within rooms in the most-exposed façades of proposed dwellings overlooking Blackthorn Road marginally exceed the target internal noise levels, via closed-window transmission. The resultant impact magnitude at these NSRs is 'low adverse' and the effect significance is 'slight'. At all other NSRs during the daytime period, and at all NSRs during the night-time period the impact magnitude is 'no change / none' and the effect significance at high sensitivity NSRs is 'neutral'.

Noise effects during the occupation phase are therefore 'not significant'.

Where predicted levels within proposed dwellings on the most-exposed façades are above the target levels during the daytime period, we note that actual levels on most floors will be lower, and that the lower floors will be most affected. Target levels may be met by the specification of glazing with increased sound attenuation on the lower floors on façades overlooking Blackthorn Road.

The resultant impact magnitude is no change / neutral. A 'negligible' magnitude of noise impact will impact 'High' sensitivity residents of the Proposed Development. This will result in a Slight short-term adverse effect and is therefore not significant.

Construction activities are not anticipated to generate significant off-site vibration effects, and no receptors with high sensitivity have been identified within close proximity to the Proposed Development, therefore evaluation of construction phase vibration and resultant impacts on human health have been scoped out of the assessment.

The above noise assessments have been carried out using appropriate guidance and methods. Effects which are determined to be not significant were identified for construction phase noise impacts on NSRs surrounding the Proposed Development, and for NSRs within the Proposed Development during the operational Phase, it is therefore considered that further assessments of human health with regards to noise are not required.

3) Water

Potential water impacts from the Proposed Development have been assessed in Chapter 7 (Water) of the EIAR. Potential source of impacts to human water users and their health from the Proposed Development were identified during the construction phase and include:

- Drilling and piling activities and/or disturbance of unidentified previously contaminated material introducing substances to groundwater resulting in poorer groundwater quality for groundwater users; and
- Wheel wash waste discharges resulting in poorer water quality for water users.

The combined mitigation (embedded and additional) identified included: a pre-construction water feature survey, no planned discharges to ground, following appropriate site management and practice detailed in CMP/CEMP, and consented discharges to the water environment or sewer where proposed. A 'Negligible' magnitude of impact was identified which may impact 'High' sensitivity human water users. This will result in a Slight adverse effect during the short-term construction stage.

During the operational phase the Proposed Development will be connected to a mains water supply. The potential impact from sanitary waste will be mitigated by connection to mains sewer, parking places (with associated oil/water interceptor) will be for parking only, and the landscaping/surfacing will be designed to provide attenuation and filtering. It is assumed that residential users will not grow vegetables in the ground in the shared areas at ground level. With this mitigation the predicted potential magnitude of impact on water quality is negligible (adverse). With 'High' sensitivity human water users this will result in a Slight adverse effect during the operational stage.

The above assessments have been carried out using appropriate guidance and methods. Effects on the water environment and the health of human water users was identified to be not greater than Slight and is therefore Not Significant. It is considered that further assessments of human health with regards to water are not required.

4) Daylight / Sunlight

A Sunlight and Daylight Analysis has been prepared for the Proposed Development by IN2 (2022). Sunlight availability was assessed against the BRE.209 criterion for amenity spaces where compliance is achieved when over 50% of the proposed outdoor amenity space receives at least 2 hours potential sunlight on March 21st to

the majority of areas. All areas are in excess of 50% sunlight availability and are therefore considered fully compliant with BRE.209 criteria. This indicates that the spaces are suitable for outdoor activities like sitting out and children's play (mainly during the warmer months) during the operational phase.

With regards to the effects of outdoor sunlighting in amenity spaces on human health, the populations living within the Proposed Development are of 'High' sensitivity due to being a 'health receptor that would be likely or expected to be directly affected. The receptor is well placed to take advantage of beneficial impacts, and/or is not well placed to deal with any adverse impacts and the magnitude of potential impact is considered Negligible Beneficial due to there being 'No or non-perceptible impact to health, population or sensitive groups' and compliance with BRE.209 criteria. This will result in a *Slight* effect during the operational phase.

IN2 undertook an internal sunlight and daylight analysis was undertaken for all units across the development. The analysis determined that 96% of rooms achieve the minimum recommendations set out in the BRE guidelines for Spatial Daylight Autonomy using median daylight factors. The proposed development achieves a high compliance rate for sunlight availability to a dwelling with 98% of units meeting or exceeding the minimum recommendations set out in BRE guidelines. This indicates that acceptable levels of natural light in new apartment developments have been achieved, noting natural lighting contributes to the liveability and amenity enjoyed by apartment residents during the operational phase.

With regards to the effects of indoor sunlighting and daylighting on human health, the populations living within the Proposed Development are of 'High' sensitivity due to being a 'health receptor that would be likely or expected to be directly affected. The receptor is expected to be either 'well placed to take advantage of beneficial impacts, ornot well placed to deal with any adverse impacts. The magnitude of potential impact is considered Negligible Beneficial due to there being 'No or non-perceptible impact to health, population or sensitive groups' and compliance with BRE.209 criteria. This will result in a *Slight* effect during the operational phase.

On the basis that all existing buildings surrounding the proposed development are commercial buildings, which have no expectation or requirement for sunlight or daylight, an assessment of the potential effects to nearby buildings from changes to daylight and sunlight availability arising from the construction and operation of the Proposed Development has been scoped out of the EIAR. Additionally, there are no neighbouring amenity areas, gardens etc. that can be impacted from an over shadowing point of view and therefore an assessment of the potential effects to such areas from changes to shading arising from the construction and operation of the Proposed Development has been scoped out of this the EIAR.

It is considered that with the employment of effective construction management practices the environmental impacts and emissions from the Proposed Development will not have a significant effect on human health in the local environs during construction. The Main Contractor's management practices will include the implementation of the final CMP, and CEMP, as well as the implementation of mitigation measures identified in Chapter 16 of this EIAR.

Potential effects on human health resulting from the Proposed Development take into consideration any embedded design and commonly undertaken good practice mitigation. These considerations are proposed in the Property Management Strategy Report (Aramark, 2022) which accompanies this SHD application. It is considered that with the employment of effective operational management practices the environmental impacts and emissions from the Proposed Development will not have a significant effect on human health in the local environs during operation.

Health and Safety

Construction Phase

The management and phasing of the construction activities have the potential to affect the health and safety of persons working at the site, local residents, local road users and other members of the public who may interact with the site. These groups are identified as populations/communities, and non-motorised users and for the purpose of this assessment the persons working at the construction site are considered a population group with a 'High' sensitivity as well.

These health and safety considerations and hazards present during the construction phase will be managed by the appointed main contractor and their nominated 'Project Supervisor Construction Stage' (PSCS). The PSCS duties will consist of the management and co-ordination of health and safety matters during the construction phase. The PSCS role will remain in place at the site from the beginning of works until the project has been completed.

The development of a Construction Management Plan and associated site health and safety management plans will ensure that hazards which may affect any relevant parties during the construction phase are appropriately mitigated. This plan will ensure that hazards affecting relevant persons will be assessed and eliminated or mitigated accordingly.

The appointed main contractor will implement a Construction Traffic Management Plan to manage instances where construction traffic may affect local road users. Methods and approaches in this plan will be agreed with DLRCC as appropriate.

The main contractor's Construction Management Plan will also contain provisions for site security. These provisions will detail appropriate measures to ensure access is restricted to authorised personnel only. Hoarding and fencing will be erected along boundaries as appropriate.

With these measures in place there will be a 'Negligible' magnitude of impact which will have no or a non-perceptible impact to the 'High' sensitivity populations or groups. This will result in a Slight short-term adverse effect.

Prior to commencement, the main contractor would ensure that the project's health and safety documentation align with the measures as outlined in the Construction Industry Federation's 'Construction Sector C-19 Pandemic Standard Operating Procedures' (CIF 2020) and the COVID-19 Specific National Protocol for Employers and Workers, general / standard health and safety requirements, considering the constraints of COVID-19. With such measures in place there will be a 'Negligible' magnitude of impact on the 'High' sensitivity group of persons working at the construction site. This will result in a *Slight* short-term adverse effect.

The appointed main contractor will appoint a PSCS. A Construction Management Plan will be developed and implemented along with the associated site health and safety management plans and construction traffic management plan.

It is assumed that the main contractor and PSCS will document a specific COVID-19 plan in line with the CIF plan, Health and Safety Authority (HSA) advice, and in consultation with the Client. The subsequent plan would consider and address the levels of risk associated with the project and tasks that workers perform on site.

Given the size and scale of the Proposed Development (and depending on risk levels at the time of commencement), the PSCS, in consultation with other contractors, would appoint a COVID-19 Compliance Officer, as necessary.

Operational phase

Health and safety considerations have been built into the design of the development. The property management company will be the responsible party to ensure the Proposed Development is managed and maintained appropriately throughout its operation/occupation.

A Property Management Strategy Report has been provided in the SHD application (Aramark, 2022). The report sets out the management strategy for the development in its operational phase in order to demonstrate how the property management and public realm maintenance will be maintained to appropriate standards, including Health and Safety. A Preliminary Fire Safety, and Access and Use Strategy Report has been submitted with this SHD application, (Maurice Johnson & Partners (MJP, 2022). The design of the Proposed Development has been subject to Fire Safety Certificate and Disability Access Certificate applications based on the appropriate design guidance identified in the MJP report. The Property Management Strategy Report (Aramark, 2022) also identifies relevant operational fire protection management for the Proposed Development.

The residents occupying the Proposed Development have 'High' environmental sensitivity. The in-built design mitigation will ensure that a low-moderate number of people would be impacted, ('Low' magnitude). This will result in a *Slight* permanent adverse effect.

It is considered that there will be a 'Negligible' magnitude of impacts from IE/IPC Licenced facilities surrounding the Proposed Development on the 'High' sensitivity population residing within the Proposed Development. This will result in a *Slight* permanent adverse effect.

1) Wind microclimate

The potential impacts from the Proposed Development on pedestrian safety and comfort have been assessed in Chapter 12 of this EIAR. This assessment has taken into account the existing topography and developments surrounding the Site.

The assessment identified that the wind conditions both within and outside of the Application Site following implementation of the Proposed Development ranged from "calmer than required for the intended pedestrian use" to "suitable for the pedestrian use intended". It is concluded that road and pedestrian circulation areas within the Application Site will experience benefits to the wind microclimate as a result of the proposals and the area to the north of the Application Site will experience beneficial, calmer conditions while other areas (south, east and west) will remain unchanged from the "calmer than required for the intended pedestrian use" conditions currently experienced.

2) Covid 19

The appointed property management company will be required to comply with latest guidance from the government and public health bodies for controlling COVID-19 transmission within the building. The management company would seek further advice from relevant government departments including The Housing Agency's (June 2020) 'Guidance for Multi-Unit Developments and Residential Owners' Management Companies during Coronavirus (COVID-19)', as appropriate.

Residents occupying the Proposed Development would be expected to be directly affected by any improper management of the development with regards to COVID-19, therefore they have 'High' environmental sensitivity. Impacts would affect a low-moderate number of people and are considered 'Low' and 'Adverse'. It is considered that this would result in a Slight impact.

It is considered that with the effective implementation and management plans and procedures identified above, further mitigation measures will not be required.

Any monitoring necessary for the protection of populations and human health during the construction phase has been identified in respective chapters of this EIAR (Land, Soils and Geology, Water, Air Quality, and Noise and Vibration).

Further monitoring in respect to site health and safety during the construction stage is identified in the preliminary Construction Management Plan and would be provided for by the Main Contractor in their Construction Management Plan prior to construction.

During the operational phase the Management Company will be responsible for the ongoing maintenance and monitoring within the Proposed Development. This will include, but is not limited to, the regular monitoring of site-specific risk assessments and method statements, fire safety features and strategies and water systems (including updating the site's Legionella Risk Assessment and water testing).

Residual effects

With the proposed construction site management and the implementation of the CEMP it is anticipated that residual effects on the local population and receptors during the construction phase will be no greater than Slight and therefore Not Significant.

During the operational phase of the Proposed Development, it is anticipated that any residual adverse or beneficial effects will be no greater than Slight and therefore Not Significant.

5.0 ECOLOGY AND BIODIVERSITY

This chapter has evaluated the importance of the ecological resources present and assessed the potential for impacts on biodiversity resulting from the Proposed Development. The assessment approach has followed best practice methodologies including the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance (2018).

A desktop assessment of available information and a habitat survey of the Site (including invasive plant species survey) has been undertaken by ecologists to map habitats and identify any areas of ecological sensitivity. A tree survey has also been undertaken for the Site and sections of DLRCC verges near the Site boundary.

The dominant habitats present within the boundary of the Site are of low ecological value and no Annex I habitats listed under the EU Habitats Directive are present within the Site. The urban setting, high density of people and traffic plus lack of ecological connectivity with natural or semi-natural features all detract from the suitability of the Site for non-volent mammal species. There is a distinct lack of available resource for the small and medium mammal group such as pygmy shrew, hedgehog, badger and pine marten on the site.

Existing structures and trees on the Site are considered to have negligible suitability for roosting bats. Additionally, no bats were recorded during an emergence survey carried out on a directly adjacent site in June 2020. That survey concluded that that site (the former Tack Packaging Site) and its immediate surroundings are considered to be of negligible importance for bats. The former Avid International Site is considered to be of negligible importance for bats.

The Application Site does not support an adequate nesting, foraging and shelter habitat for birds. An absence of woodland, trees or even unmanaged grasslands dictates that the Site is relatively sterile for bird species. The bird community recorded at the Site is representative of a disturbed urban environment and is characterised by the presence of mostly common and widespread bird species. The species recorded included two species that are red-listed in Birds of Conservation Concern in Ireland 2013-2019: Herring Gull and Starling.

There is no available resource on Site for aquatic fauna and the nearest potential resource (Carrickmines Stream) is offsite and located approximately 600 m to the south of the Site.

There are a number of trees within the Application Site, which have been assessed by an arboricultural specialist. Northern Tree Services undertook an arboriculture assessment which indicates that trees assessed are chiefly high value mainly for their landscape qualities. There are no Tree Protection Orders (TPOs) on any of the trees on the Site.

There are four proposed national designated National Heritage Areas (pNHA) within 5 km of the Site. There are no ecological pathways, habitat or species synergies between the pNHAs and the Site. As such, the pNHA have been scoped out of the ecological impact assessment.

The nearest Natura 2000 receptors are approximately 3.6 km from the Site within Dublin Bay. These include the North Dublin Bay SAC and South Dublin Bay SAC, SPAs for various bird species (South Dublin Bay and River Tolka Estuary SPA, and North Bull Island SPA), and a Nature Reserve (North Bull Island Nature Reserve). Part of the near-shore water (about 1.5 km off the coast of where the Shanganah River discharges into the sea, and 8 km east of the Site) is designated as the Rockabill to Dalkey Island SAC. The Wicklow Mountains SAC and SPA are located approximately 6.5 km to the south west. This SHD application is accompanied by a stage 1 Appropriate Assessment screening report and this provides an evaluation of likely significant effects that may, or may not be, afforded to Natura 2000 sites as a consequence of the Proposed Development.

Impact Assessment and Mitigation Measures

The assessments are made in accordance with the guidance contained in the document Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2018).

The key construction phase and residential (operational phase) impacts assessed are loss or damage to on Site trees and aquatic eutrophication as a consequence of increased nutrient loading due to increases in population density and pressure on existing foul drainage processing.

Site Trees – Construction and Operational Impacts

The Proposed Development will cause the permanent loss of trees. Any trees removed from the Site are for purposes of Landscape Design.

Characterisation of Unmitigated Impact on the Feature

In the absence of mitigation, trees on the Site due to be retained could be damaged during construction by vehicular compaction of soils indirectly, and intrusive works directly, damaging root structures, and during operations by sealing of surfaces where works of development occurs near trees.

Additionally, trees removed will be permanently lost, though it is worth reiterating that trees planned to be removed in the landscape design do not represent a valuable biodiversity resource and proposed planting of new trees will offset impacts

Rationale for Prediction of Effect

Tree habitat is relatively scarce in the wider context of the Site. The removal or damage of trees is more likely to have an aesthetic impact in contrast to a measurable impact on biodiversity e.g. nesting birds or the tree itself. Nonetheless, it is considered that the loss or damage of these trees would negatively impact the Site landscape.

Effect without Mitigation

The unmitigated effect of this habitat loss would result in a minor permanent impact to habitat of Site sensitivity and importance.

Aquatic Receptors – Construction and Operation Impacts

The Proposed Development will lead to an increase in nutrient loading due to be managed by the Ringsend facility. In addition, sediment loading from Site run off during construction may occur though there are no surface water receptors that would receive turbid water containing elevated suspended sediments. As a consequence

of the increase in trophic status in the absence of mitigation, aquatic receptors such as fish and also habitats could be adversely impacted by eutrophication.

Characterisation of Unmitigated Impact on the Feature

The Proposed Development has potential to cause measurable increases in nutrient loading which could degrade the quality of aquatic habitats in the absence of mitigation.

Rationale for Prediction of Effect

Alterations to water quality have potential to adversely affect aquatic downstream receptors, impacting on the balance of the current aquatic ecosystem, potentially leading to a loss in biodiversity. Increases in total suspended sediments (TSS) may also factor in the absence of mitigation.

Effect without Mitigation

The unmitigated effect of this Proposed Development could result in a minor impact to habitat of regional sensitivity and importance.

Mitigation and Management

All Site construction will be undertaken in accordance with the Construction Industry Research and Information Association's (CIRIA) (2015) C741 Environmental Good Practice on Site Guide (fourth edition).

Aquatic Receptors

To prevent any pollution incidents that might potentially cause deterioration of the aquatic environment it is proposed that a series of best practice measures are introduced throughout works, in accordance with CIRIA guideline documents C532 (CIRIA, 2001) and C741 (CIRIA, 2015), and Enterprise Ireland's best practice guidance for oil and hydrocarbon storage (BPGCS005). Dangerous substances such as oils and fuels will be stored at all times in a bunded area. Only clean water would be allowed to enter public surface water system. Where necessary, silt traps will be used to remove sediment and solid matter prior to discharge to surface water systems. The Site manager will be responsible for ensuring that pollution does not occur, and Site personnel will be trained in the importance of pollution prevention.

The increase in nutrient contribution from increases in Site residential usage will effectively be addressed by upgrades at the Ringsend wastewater treatment plant (WTP). The Ringsend WTP discharges into Dublin Bay which is currently classified as being unpolluted by the EPA and attaining 'good' ecological status as defined by the WFD.

Retention or removal of on-Site habitats

Trees that are to be retained in the landscape design will be protected in accordance with best practice guidance (BS5837, trees in relation to construction) as detailed in Tree Survey Report & Arboricultural Impact Assessment prepared by Northern Tree Services (2022). Any trees to be removed will be done so in line with the Tree Survey Schedule prepared by Northern Tree Services (2022) and outside of the bird nesting season on a precautionary basis. The nesting season is considered to be between March and August inclusive. If trees are required to be felled within the nesting season a suitably qualified ecologist will first check to ensure that the trees do not support nests. In the unlikely event that nests are discovered and in use the trees will not be cleared until the young have fledged.

To reduce the impact of construction activity, Tree Survey Report & Arboricultural Impact Assessment (Northern Tree Services, 2022) recommendations shall be observed in sequence:

- The erection of temporary staked Tree Protection Barriers (TPB) to establish a fenced-off Construction Exclusion Zone (CEZ) before any demolition and/or construction works begin on-site in the areas where trees to be retained;
- Installation of temporary ground protection (TGP): before any demolition and/or construction works begin on-site;
- Route underground services: not within the Root Protection Areas (RPAs) of any retention trees;
- Installation of Cellular Confinement Systems;
- Remove TGP and TPBs;
- Landscape works (leading to a net gain of trees on the Site).

Any tree removal or planting on DLRCC lands will require prior approval from DLRCC. The Principal Contractor will ensure that seed mixes to be used on DLRCC lands are agreed in advance with DLRCC, where required.

Invasive Species

The presence of invasive plant species was sparse during Ecological Survey, immature *Cotoneaster* sp. and *Buddlejea* sp. found in the BL3 habitat and considered non-significant and will be removed by competent contractors prior to commencement of construction works.

Measures will be implemented throughout Site works to safeguard against the spread of any invasive non-native species (such as Japanese knotweed or Cotoneaster). The Principal contractor for the construction of the Project will ensure that all materials imported or exported from the Site are not contaminated and monitoring will take place post-construction to ensure that invasive species do not colonise the Site.

Monitoring

A precautionary approach will be adopted regarding invasive place species, and invasive plant species surveys will be carried out by suitability experienced persons at the earliest opportunity, in advance of any Site works commencing on the site, and annually until completion of the construction phase. Should invasive plant species be identified from these survey(s), the Principal Contractor will be required to develop and implement an Invasive Species Management Plan, that will set out, at a minimum; the identity of the species, the location of individual plants and stands, and the treatment methodology and programme, and any additional required site safety measures to be implemented. Treatment should only be undertaken by an appropriate and experienced party.

NMP (2022) sets out monitoring requirements to ensure successful establishment of landscaped elements, including plant, trees and gasses, and invasive floral species.

Residual Effects

In the absence of mitigation, it is considered that the Proposed Development would result in Minor effects to features of Site and Regional value. However, with the implementation of appropriate mitigation it is considered any residual effects on the Site will be Not Significant i.e. no perceivable impacts on ecological features (habitat or species). Impacts may be beneath levels of perception, within normal bounds of variation, within the margin of forecasting error, or impacting on exceptionally poor baseline conditions.

6.0 LAND, SOILS AND GEOLOGY

Chapter 6 of the EIAR considers and assesses any potential impacts and effects on land, soils and geology that can be reasonably foreseen as a consequence of the construction and operation of the Proposed Development during the construction and after-use phases.

The main receptors identified that required to be assessed were land (soil/sub-soils) at and immediately adjacent to the Proposed Development and human health (workers during construction and after-use occupiers), that could be secondarily affected by changes to soils/sub-soils.

Impact Assessment and Mitigation Measures

No geological heritage sites or mineral sites have been identified as part of the baseline. The superficial tills are unlikely to represent a future resource and the bedrock geology beneath the Site that could be used as a crushed rock resource is ubiquitous across Ireland. Therefore, the impacts to, and effects on, geological sites and mineral or aggregate reserves were not considered further in this assessment.

There is no indication that the Proposed Development would sterilise any limited geological resources and there are no soils (agricultural or not) mapped at the Site, so the use or sterilisation of natural resources, loss of organic matter, soil erosion, or soil compaction were not considered further in this assessment.

The main potential impacts and associated effects that will be considered in the assessment relate to the following:

- Activities or events that might impact land quality during construction (e.g. leaks and spills from machinery or stored substances, or discharges);
- Mobilisation of existing contamination by construction works (e.g. earth movements, excavation and foundation construction) should there be historical contamination at the Proposed Development, which could impact workers and land quality;
- Dewatering during construction that could lead to destabilisation and/or subsidence of unconsolidated soils and sub-soils;
- Importation of material that could be unsuitable for the intended after-use;
- Activities that might impact land quality or development occupiers during operation (e.g. leaks and spills); and
- Fuel and chemical storage during operation – general maintenance activities.

Known design and construction management mitigation measures were accounted for in an assessment of initial impacts and effects. Where additional mitigation measures could be incorporated to reduce the initial impacts and effects, these were identified and included in an assessment of residual impacts and effects.

The following additional mitigation will take place:

- If evidence of previously unidentified potential contamination (either visual or olfactory) is identified during construction works, construction good practice and management procedures will be followed that may include investigation and assessment works. Any contaminated waste material identified during such works that needs to be removed from site will be disposed of at an appropriately licensed landfill.
- Any sludge collected from wheel wash used during construction will be tested and disposed of to an appropriate waste disposal facility. No used water or settled solids will be disposed of to land without prior consent of the EPA.

After-use phase occupiers of the Proposed Development will be responsible for managing their activities and applying for (and working within the constraints of) any environment authorisations or consents required for their operations. If the requirements of relevant regulations, licenses and permits (e.g. integrated pollution prevention and control under The Environmental Protection Agency Act 1992 and the Protection of the Environment Act 2003) are adhered to, the magnitude of impact and likelihood will be reduced to acceptable levels.

Residual Impacts

In summary, the significance of residual effects on soils and geology (and on human health from soils and geology) resulting from the different potential sources of change are predicted to be no greater than Slight and, therefore, are considered Not Significant.

7.0 WATER

This assessment has considered the potential impacts and effects on the water environment that can be reasonably foreseen as consequences of the normal construction and operation of the Proposed Development during the construction and after-use phases.

The assessment considers groundwater levels, flow regime, and quality; and surface water flows, quality and flood risk. The main receptors that required to be assessed were groundwater, surface water, on-site plant and infrastructure, infrastructure immediately adjacent to and downstream of the Proposed Development and human health (specifically existing water users) that could be secondarily affected by changes to the water environment.

The Water Framework Directive Groundwater Body (GWB) over which the Proposed Development is located is the Kilcullen GWB. The bedrock is classified as a 'Poor Aquifer' (i.e. the bedrock is generally unproductive except for local zones). The bedrock aquifer is classified as having 'good' Water Framework Directive groundwater body status. There are no mapped gravel aquifers (sensitive groundwater bodies).

The vulnerability of groundwater is moderate on the west side of the Site and high on the east. The change in vulnerability is likely due to a reduction in thickness of soil cover from west to east. The Site is currently covered in hardstanding, which limits groundwater recharge. There are no areas of groundwater flooding probability shown on the Geological Surveys of Ireland's Groundwater flooding probability maps. The Site is not mapped as at risk of flooding from rivers or the coast. There are no records of past flooding events in the immediate vicinity of the Site.

The Proposed Development is in the Liffey and Dublin Bay WFD catchment, the Dodder WFD sub-catchment and the Brewery Stream River sub-basin. There are no surface watercourses on site and the closest is the Stillorgan Reservoirs are located just over 200 m to the north.

Existing Flows and drainage are present at the site. There there is a 450 mm diameter public surface water sewer in Carmanhall Road and a separate 375 mm diameter public surface water sewer in Blackthorn Avenue. The previous development was connected to the junction manhole on Blackthorn Avenue. Both these sewers are expected to discharge to Brewery Stream/Carysfort Maretimo Stream. There is an existing connection to the 225 mm diameter clay wastewater sewer in Carmanhall Road. There is also another 225 mm foul sewer in Blackthorn Avenue.

The Site is not in a Group Scheme and Public Supply Source protection area. There is only one well or spring mapped within 2 km. That borehole is located over 1.7 km northeast of the Site. It was drilled in 1997 to 85.3 m depth. The purpose of the borehole is not specified, and there is no abstraction rate recorded, so it could be a monitoring well. Private water supplies could be present, but the poor aquifer potential limits the likelihood

There are no international designated sites at, or within 2 km of, the Proposed Development. Where it is possible the impacts to the water environment study area could also impact ecological receptors (e.g. downstream designated sites that could have some water dependence – either on water quality or flows - for their qualifying species/habitats) this has been discussed in EIAR Chapter 5, 'Ecology and Biodiversity'.

Impact Assessment and Mitigation Measures

Construction Phase

Impacts to surface water could occur directly or indirectly via surface flows or via groundwater. Impacts to groundwater are more likely to be indirect through the ground, but excavations into the sub-surface would reduce soil and sub-soil thickness and could result in an increased risk to aquifer water quality from contamination/pollution incidents on the surface.

There is also the potential for activities undertaken during construction to create a new pathway for an impact to affect a receptor, or increase the likelihood or magnitude of an impact. Piling activities, if used for ground improvements or foundations, and excavations into the subsurface could create pathways that increase the vulnerability of groundwater by either providing a source of pollution in the activity itself or creating more rapid/direct pathways for pollution transport to groundwater.

Changes in Water Quality (Groundwater and Surface Water)

Potential sources of impact that could result in a change in water quality depend on the activities that will be undertaken during construction. The following potential sources have been identified through the project description and experience of typical construction activities:

- Refuelling leaks or spills could introduce hydrocarbons to the water environment.
- Leaching of substances from imported infill materials if the materials are not of suitable quality.
- Discharges or leaks from welfare facilities could introduce washing and toilet facility waste to the environment.
- Wheel washing discharges that could be contaminated with hydrocarbons, brake dust, metals, road salt, cleaning agents and other traffic residue.
- Leaks and spills of substances during storage, transport, use and/or disposal.
- The introduction of drilling fluids through piling (foundation type to be confirmed).
- Dewatering and the discharge of dewatering water. Based on the project description, dewatering would be within the top metre or two from the ground surface rather than within deeper aquifer systems, but the discharge of groundwater to a different location, such as surface water, could impact surface water quality.
- Works that discharge water to the surface water sewer, which in turn discharges into Brewery Stream/Carysfort Maretimo Stream. Poor sediment erosion control could result in high suspended solids. Construction activities such as excavations, earth movement, stockpiling, reprofiling and building represent potential sources of suspended solids.

Embedded mitigation includes activities or processes to manage and limit the potential impact from refuelling, leaching from imported materials, leaks and spills from stored and used substances, and water discharges. With management in place, the predicted magnitude of impact is considered to be negligible (adverse).

However, the impacts associated with potential for previously unidentified contamination and piling activities mean that pollution events could occur, baseline water quality could deteriorate, and water quality standards could be breached. The predicted magnitude of impact to water quality is high (adverse).

It is assumed that the wheel wash would be supplied from the mains and would be reused as much as possible. The water and sludge that collects in the wheel wash has the potential to become contaminated with material washed off the vehicles. There are no planned discharges to ground, but if this was to be discharged or leak to the water environment, this could affect water quality. The predicted impact to water quality is high (adverse).

Changes in Surface Water Flow Characteristics (Catchments and Run-off Rates)

Increased hardstanding (e.g. roads and paving) can change surface water flow regimes, which can in turn affect flood risk. Capturing excess water during construction to manage water levels (e.g. passive or active dewatering) or water quality (e.g. settlement ponds) could result in changes to discharge rates and locations from the catchment.

Taking into account the intended water management design prepared by Waterman Moylan and the construction good practice measures, the predicted magnitude of impact is considered to be negligible (adverse).

Changes in Groundwater Flow Regime (Levels and Flows)

Changes in recharge to groundwater could occur as a result of increased coverage of the ground with hardstanding and due to the compaction of soils during construction. This could, in turn, result in a change in groundwater resource availability. Given that the Site was previously developed, the underlying subsoil/superficial deposits are clayey and the bedrock is classified as a poor aquifer, the predicted impact on groundwater recharge is considered to be negligible (adverse).

If any groundwater abstraction is required for dewatering, this will result in a localised change in groundwater flow directions and levels. This could, in turn, result in a temporary change in local groundwater resource availability. The near surface ground conditions at the Site are known to be clayey and, although water has been encountered, only minor seeps have been observed. Therefore, if dewatering of any kind (including passive drainage of excavations) is required, the predicted impact on groundwater flows and levels is considered to be negligible (adverse).

Piled foundations result in the installation of a barrier to groundwater flow in the sub-surface. This can locally change groundwater flow paths and change groundwater levels (back up of groundwater upgradient and groundwater shadowing downgradient), particularly if the piling is laterally extensive, or extends to the full thickness of an aquifer. If such activities are undertaken, there is the potential to impact groundwater resource availability. Given the size of the Proposed Development compared to the lateral extent of the mapped geological units, that underlying subsoil/superficial deposits are clayey with low hydraulic conductivity meaning that any changes in water levels will likely be over short distances, and the bedrock is classified as a poor aquifer, the predicted impact on groundwater flows and levels is considered to be negligible (adverse).

Secondary Receptors

Effects on the water can have secondary effects on human water users. The nearest known water borehole is located over 1.5 km from the Proposed Development and the area is known to have mains water supplies. However, there could be unknown private water supplies or abstractions from surface water in the study area, so the end user could also be affected by any changes in groundwater quality and/or availability. The magnitude of the predicted impact to water is discussed in the text above. The associated level of effect depends on the importance of the receptor.

Secondary receptors to changes in surface water flows and flood risk include Development plant and infrastructure, and infrastructure immediately adjacent and downstream of the Proposed Development itself. Taking into account the intended water management design and the construction good practice measures, the predicted magnitude of impact is considered to be negligible (adverse).

Secondary impacts to ecology as a result of changes to the water environment are addressed in Chapter 5.

After-use (Operational) Phase Impacts

The proposed after-use of the Development is a mixture of residential housing and associated amenities (e.g. shared utilities, recreational spaces, parking and childcare facilities). For the purposes of this assessment it is assumed that residential users will not grow vegetables in the ground in the shared areas at ground level. The Proposed Development will be connected to mains water and sewerage. It is, therefore, unlikely that additional water supplies will be required.

Depending on the activities that may take place during the occupied after-use phase, there is the potential that discharges to ground, or leaks, could lead to water quality being affected. Such discharge or leaks could originate from sewerage; drainage from areas of hard standing (e.g. car parks and roads); or transport, storage and handling of hazardous substances required for plant maintenance. The potential impact from sanitary waste will be mitigated by connection to mains sewer, parking places (with associated oil/water interceptor) will be for parking only, and the landscaping/surfacing will be designed to provide attenuation and filtering. With this mitigation the predicted potential impact on water quality is negligible (adverse).

After completion and during occupation of the proposed development, surface water will be collected in the site-wide surface water collection system and be stored in attenuation tanks before being discharged at greenfield rates. Compared to the existing unrestricted surface water discharge from the land, this is considered to result in a low (beneficial) impact on surface water discharges.

Other potential changes to surface water flow, water quality or water availability that continue through the after-use phase, but that originated from permanent sources of impact initiated in the construction phase (e.g. changes to drainage, hardstanding, foundations) are not reconsidered in this assessment phase.

The Proposed Development will be equipped with a fire safety system using mains water. In the unlikely event of a major fire the predicted potential impact on water quality would be negligible (adverse), as no significant quantities of hazardous materials will be stored on-site and the Site's SuDS system would be expected to treat some, if not all, of the run-off fire water that arose.

Mitigation and Management

Measures to further mitigate the initial effects associated with the potential impacts on the water environment and associated human users are set out in the EIAR chapter and, in summary, comprise a pre-construction water feature survey, waste management measures, good practice design and construction methods, use of appropriate EPA guidance, and the requirement to obtain license/consent for any discharges as required by the Local Authority.

No monitoring requirement is foreseen to maintain and protect the conditions of the water environment. Any monitoring associated with licences or permits will be detailed within the licences or permit documentation.

Residual Effects

The significance of residual effects on water (and on human health from water) resulting from the different potential sources of impact are predicted to be no greater than slight adverse and, therefore, not significant in terms of this assessment.

8.0 AIR QUALITY AND CLIMATE

This chapter of the EIAR considers the potential effects of the Proposed Development on air quality and climate. The effects have been assessed in the context of relevant national, regional and local air quality policies. A qualitative assessment of dust impact from the construction phase has been undertaken in line with Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction' (IAQM, 2014). The assessment considered the construction and operational phases of the Proposed Development.

The assessment considers aspects of the Proposed Development that are potentially vulnerable to the effects of climate change. Where relevant aspects have been identified, these can be mitigated through embedded mitigation, monitoring or other measures, and also the impact on environmental receptors sensitive to climate change.

It should be noted that a Climate Change Impact Assessment has been prepared for the Carmanhall Road SHD 2022 application pack by Enviroguide Consulting. That document was prepared in accordance with DLRCC planning requirements and it assesses the impact of climate change on the Proposed Development and ensures that the policies and objectives produced and implemented by the local authority in relation to climate change and climate change protection measures, particularly in relation to drainage design, as set out within the Dún Laoghaire Rathdown County Development Plan 2022-2028, have been incorporated into the Proposed Development design. The report sets out adaptive design measures that have been incorporated into the design of the Proposed Development design.

Impact Assessment and Mitigation Measures

Construction phase

A qualitative assessment of dust impact from the construction phase has been undertaken in line with Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction' (IAQM, 2014). In line with the guidance, the study area for the construction phase assessment extends up to 350 m from the boundary of the Site and within 50 m of the routes used by construction vehicles on the public highway, up to 500 m from the Site entrances. Human receptors have been identified within the study area and assessed accordingly. No relevant ecological receptors such as Natura 2000 Sites (e.g. Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)) are located within the study area; therefore, assessment of potential effects on ecological receptors was scoped out of the assessment.

A full qualitative construction phase dust assessment was carried out. The potential changes that could occur from the Proposed Development were considered and the magnitude of that change assigned. To define the risk of impacts from either dust soiling effects and human health impacts, the dust emission magnitude has been combined with the sensitivity of the area to determine that prior to mitigation the risk of impacts of dust soiling and human health is medium to low for earthworks, construction, and trackout activities associated with the Site. Taking into consideration the mitigation associated with the Proposed Development design, good practice construction methods and pollution prevention measures that will be followed as part of the construction phase, the magnitudes of all predicted changes to air quality during construction are not significant. Therefore, it is concluded that there are no significant effects on air quality from dust arising during the construction phase of the Proposed Development. Detailed mitigation measures have been provided in full in the EIAR Air Quality chapter.

Based on the temporal nature of the construction phase of the Proposed Development (approximately 24 months), impacts of climate are deemed to be short- term and not significant.

Operational phase

A quantitative operational phase assessment of effects from road traffic emissions was undertaken in accordance with Environmental Protection UK/Institute of Air Quality Management guidance document 'Land – Use Planning & Development Control: Planning for Air Quality' (EPUK/IAQM 2017). Detailed dispersion modelling using ADMS-Roads was undertaken to determine the effect of the Proposed Development on traffic derived pollutants, nitrogen dioxide (NO_2) and particulate matter, at nearby sensitive receptors. During this operational phase, the study area for human receptors extends to 200 m either side of all 'affected roads' – i.e. those meeting the criteria set out in the guidance. Human receptors were identified within the study area and therefore assessed. However, as no Natura 2000 Sites (e.g. SPAs and SACs) were identified within the study

area the assessment of impacts on ecological receptors was scoped out of the assessment. The magnitude of all predicted changes to air quality during the operational phase from operational traffic emissions are negligible, based on criteria set out in the EIAR chapter. Therefore, it is concluded that there are no significant effects on air quality from traffic arising from the operation of the Proposed Development.

The effect of Climate Change on the proposed development considered potential impacts to changes in air quality, noise, landscape and visual, water and flood risk, and geology, ground conditions and groundwater is considered. The potential impacts of climate are considered to be not significant.

Mitigation and monitoring measures

The EIAR assessment (Table 8.10 therein) sets out both mandatory and recommend mitigation measures during construction phase for activities comprising communication, site management, monitoring, preparing and maintaining the site, operating vehicle machinery and sustainable travel, construction activities, waste management, earthworks, general construction, and trackout.

Residual Effects

Following the application of the site-specific mitigation measures set in the EIAR, it is considered that the residual effects associated with the construction phase of the Proposed Development will be not significant. As no site-specific mitigation measures are required, it is considered that the residual effects associated with the operational phase of the Proposed Development will be not significant.

There is the potential for greenhouse gases (GHG) to be generated during both the construction and operational phases of the Proposed Development. Primary sources of direct GHGs in the construction phase (approximately 24 months duration) will likely include vehicle movements, plant operation, waste disposal, and water and energy use. There will also be indirect sources of GHG emissions through the manufacture of the construction materials. The generation of GHGs during the construction phase will be short duration and therefore the impacts are considered to be not significant.

Operational direct sources of GHG will include vehicle movements, waste disposal, and energy and water use associated with the Proposed Development. Energy efficiency and reduction measures are inherent in the Proposed Development design, which will aid the reduction of operational GHG emissions throughout the life of the development. Based on the quantum of Greenhouse Gas emissions estimated to be generated by the Proposed Development, the impacts are deemed to be negligible and therefore not significant.

The climate assessment has considered climate change resilience and adaptation, i.e. how the Proposed Development may interact with a changing climate and whether this interaction could result in significant environmental effects. No change to the residual air quality, noise, landscape and visual, water and flood risk, and geology, ground conditions and groundwater effects was identified.

9.0 NOISE AND VIBRATION

This assessment has considered potential noise impacts associated with the construction and occupation of the Proposed Development. The assessment comprised characterisation of the baseline noise environment, adoption of appropriate evaluation criteria, prediction of noise levels at identified Noise Sensitive Receptors (NSRs) and specification of appropriate mitigation.

The assessment included a desk study to determine an appropriate study area and identify potentially sensitive receptors, characterisation of the baseline noise environment, prediction of worst-case construction and operational / occupation phase noise levels and evaluation against appropriate criteria. The Proposed Development lies within a predominantly commercial and light industrial area, with no high-sensitivity NSRs nearby.

Construction activities are not anticipated to generate significant off-site vibration, and no receptors with high sensitivity have been identified within close proximity to the Proposed Development, therefore evaluation of construction phase vibration was scoped out of the assessment. The Proposed Development is not anticipated to generate vibration during the operational phase, therefore vibration impacts during the operational/occupation phase were scoped out of the assessment.

Impact Assessment and Mitigation Measures

The noise environment in the vicinity of the Site was dominated by road traffic on Carmanhall Road and Blackthorn Road, with a lesser contribution from Ravens Rock Road and the distant M50.

Predicted construction phase noise effects were examined for a 'worst-case' scenario (site clearance and preparation activities) and were determined to be neutral/not significant at the closest off-site NSR (NSR5) as they meet the noise threshold during the proposed construction hours (weekday daytimes, Saturday mornings). Construction management measures will be required to ensure compliance with noise criteria for construction activities. Additional mitigation measures within the Construction Environmental Management Plan will need to be incorporated to ensure that short-term residual effects from construction activities are kept within acceptable limits.

Following the completion of a detailed Construction Management Plan by the appointed Main Contractor, and once any requirements for out-of-hours activities have been identified, detailed noise predictions will be undertaken for these activities to determine any specific mitigation measures required such that the noise thresholds are met at NSRs.

Best practice noise control measures, scheduling of works within appropriate time periods, strict construction noise limits and noise monitoring will be used during the construction phase. This will ensure effects are controlled and will meet threshold criteria derived from measured baseline noise levels.

Noise associated with changes to traffic flows on the local road network has been predicted using noise modelling software. Noise levels from road traffic have been predicted for the future scenario with the Proposed Development. The development years for which traffic flows were predicted and provided were 2026 and 2031. Noise impacts from the road traffic have been assessed within internal areas of the Proposed Development, and also the external amenity areas, which were identified as NSRs.

Operational / occupation phase noise impacts at proposed NSRs will be mitigated through appropriate specification of alternative ventilation within residential units, such that internal target noise levels will be met using closed-window attenuation. As a result, effects to proposed NSRs arising from road traffic on Carmanhall Road and Blackthorn Road, and noise from commercial / industrial sources, has been assessed to be not significant.

The EIAR chapter sets out noise control measures for Construction Phase will be included in a Noise Management Plan. Any out-of-hours work specific to the relevant phases of the Main Contractor's works will be addressed within the final CMP and updated in the Site's CEMP. These management measures will set out appropriate measures to ensure that construction noise meets the derived criteria at all sensitive receptors. Arrangements for noise compliance monitoring during construction is to be agreed with DLRCC, with details to be updated in the Site's CEMP.

Predicted internal noise levels marginally exceed the criterion within proposed dwellings on the most-exposed façades via closed window attenuation, during the daytime period (predicted levels meet the criterion during the night-time period). Alternative ventilation will be provided, either comprising acoustic trickle ventilation or mechanical ventilation, such that windows do not need to be opened. If trickle ventilation is adopted, then the vents must give an equivalent or greater sound reduction to external noise levels to that of thermal double glazing; 33 $Dbr_{w+}C_{Tr}$.

For predicted noise levels with dwellings on the most exposed façades to meet the daytime criterion, double glazing providing a sound reduction of at least 35 $Dbr_{w+}C_{Tr}$ should be installed.

At detailed design stage, plant will be specified such that noise from ventilation and air conditioning within proposed dwellings will meet NR20 Noise Rating Curves as specified in BS8233.

Residual effects

Provided that appropriate construction management measures are implemented to ensure works meet appropriate noise limits at all sensitive receptors, no additional mitigation is required, therefore residual effects remain Not Significant, for the construction phase.

No specific mitigation is required for the operational / occupation phase beyond the use of closed windows to achieve internal noise criteria, and residual effects therefore remain Not Significant.

10.0 CULTURAL HERITAGE

This assessment has considered the potential effects of the Proposed Development on cultural heritage during both the construction and operational phases. The term 'cultural heritage' is used collectively to refer to all assets of archaeological, architectural and historical or cultural value. The assessment included a detailed baseline study to establish the existing conditions, and an effects analysis and impact assessment that considered both direct effects (e.g. physical disturbance) and indirect effects (e.g. changes to setting due to dust and visual changes). The assessment of indirect effects has been informed by the results of other assessments, including the Air Quality and Climate, Noise and Vibration and Landscape and Visual technical assessments in the EIAR.

Impact Assessment and Mitigation Measures

It is considered that the Proposed Development will have no direct or indirect impacts upon known archaeological monuments or other items of cultural interest that enjoy statutory protection within the Study Area. This report has demonstrated the agricultural nature of the site until its development in recent years, associated with the larger Sandyford Industrial Estate. Where historical mapping depicts a townland boundary across the Site, which dates at least to the 1750s (if not considerably earlier), there are no surface indications of historical settlement.

Although the construction of the existing structure would not have occasioned significant disturbance to substrates, it is likely that there was some ground reduction undertaken across the general area to create a level surface for construction. This, in all likelihood, truncated any evidence for historical agricultural development, where it is nonetheless possible that the historic townland boundary presents as a cut feature. There is little further potential for the survival of unrecorded monuments.

During construction there is the potential for undiscovered archaeological remains beneath the surface to be disturbed by construction. The effect, should it occur, is permanent and irreversible. Ground disturbance will be limited to construction activities, and so no direct effects are predicted as a result ofoperation.

In lieu of specific guidance from the Institute of Archaeologists of Ireland (IAI), the impact assessment conformed to the guidelines set out by the Chartered Institute for Archaeologists. The asset value is Very High and magnitude of effect high. Therefore, the significance of the effect (before mitigation) is Profound adverse, noting that this is a conservative scenario, assuming very high value archaeological remains do exist within the Proposed Development.

During construction phase, to mitigate for the potential presence of undiscovered archaeological remains within the Site, an agreed archaeological strategy will be implemented where the Main Contractor will appoint a suitably

qualified and licensed specialist archaeological contractor to undertake the works outlined below and ensure these works are accommodated within the construction programme.

The appointed archaeologist will be required to prepare an archaeological method statement for the proposed works, which will be agreed and approved by the National Monuments Service of the Department of Housing, Local Government and Heritage. The appointed archaeologist will also be required to obtain the relevant licences to undertake the works.

A targeted archaeological trenching exercise will be undertaken during construction. Should the townland boundary be identified, the licensed archaeologist will amend the method statement to hand excavate and sample the fill at its base to recover potentially early environmental material, which may in addition provide dating evidence for the area's enclosure.

No cultural heritage specific mitigation is required during operation. Beyond the proposed archaeological strategy, no long-term or on-going monitoring for cultural heritage is required.

Residual effects

The residual effects in construction remain Slight adverse due to potential of encountering undiscovered archeological remains (noting this is a conservative scenario). No residual effects from the Proposed Development are predicted on cultural heritage assets during operation.

11.0 TRAFFIC AND TRANSPORT

This assessment has considered the potential impacts and effects of the Proposed Development on the surrounding road network. The receiving environment has been assessed in terms of walking, cycling, public transport and road infrastructure. The environmental effects associated with the increased traffic have been assessed elsewhere in the EIAR, the Air Quality and Climate and Noise and Vibration technical assessments.

The Proposed Development is proposed to be accessed by way of an entrance from Carmanhall Road and egress onto Blackthorn Road. Car parking with a total of 125 car spaces will be provided, with 45 provided at Lower Ground and 80 at Basement level. Cycle parking with 447 spaces will be provided at Lower Ground Level. The Car Parking Strategy has been developed in line with the DLR County Development Plan 2022-2028.

Access is proposed from Carmanhall Road with egress onto Blackthorn Road. An entrance is proposed on Carmanhall Road for cars, service deliveries, refuse freighter and emergency vehicles along the eastern boundary of the Application , adjacent to the proposed Tack Sandyford SHD site to the west. The proposed egress onto Blackthorn Road would be for all vehicles and located at the southeast corner of the Application Site to the south of the signalised junction with Burton Hall Road. It would be a one way out with left turn only onto Blackthorn Road. The sightlines for the proposed exit from the Proposed Development onto Blackthorn Road have been based on the Design Manual for Urban Roads and Streets (DMURS).

A green street has been created in the center of the site on the boundary between the Application Site and the proposed Tack Sandyford SHD site. The street will provide access to the landscaped courtyard as well as the cycle storage and car park located under the elevated podium. Access to the cycle parking area will be along a 1.75 m wide connection from the cycle tracks on Carmanhall Road and Blackthorn Road.

Impact Assessment and Mitigation Measures

The public realm around the Site will incorporate an upgrade of the pedestrian and cycle environment including integration with the Sandyford Cycle Improvement Scheme. The development includes all associated infrastructure to service the development including access junctions, footpaths and cycle paths together with a network of watermains, foul water drains and surface water drains.

A concurrent development with a separate EIAR on the former Tack Packaging site to the east will comprise 207 Build-to-Rent residential units and 79 car parking spaces at Lower Ground Level and Basement. Access is proposed from Ravens Rock Road and egress onto Carmanhall Road. The traffic impact from this development has been incorporated into this EIAR.

The requirements of the DLR County Development Plan 2022–2028 in relation to Sustainable Travel and Transportation including roads, car parking, cycling and walking are identified in this report and their application in relation to the proposed development clarified. Likewise, the requirements of the Sandyford Urban Framework Plan in relation to Sustainable Infrastructure Policies and Objectives.

During the preparation of the TTA for this development, two alternative scenarios were considered as part of the assessment of the traffic impact of this development. Firstly, to assess the traffic impact of a residential development on the subject site. Secondly, to assess the subject site in conjunction with the adjoining site as a single development for traffic purposes. As both the Proposed Development and the Tack Sandyford SHD Site form part of an overall masterplan, the latter option was selected and the developments on the two sites assessed as a single development on a single site.

The results of the assessment confirmed that the junctions on the surrounding road network would remain within in capacity post development in in the Opening Year 2026 through the Design Year in 2031 to the Future Year 2041.

The assessment also confirmed that the public transport serving the proposed development, both bus and light rail would remain within capacity into the future.

This chapter demonstrates that the proposed development will be consistent with the objectives for Sustainable Travel and Transport set out in the DLR County Development Plan and the Sandyford Urban Framework Plan.

Construction phase

Traffic associated with the construction stage of the Proposed Development will vary during the course of the works. The expected traffic movements during the construction period will vary significantly from month to month depending on the activity in progress.

For the purpose of this EIAR, a worst-case scenario has been assumed based on

- A 12-hour day between 07h00 and 19h00 Monday – Friday
- 20 working days per month
- Concurrent construction of the basements and substructures on the adjoining former Avid and former Tack sites.

Overall, the expected HGV movements during the construction stage are predicted to vary from 45 – 50 arrivals per day and a similar number of departures per day. In addition, traffic will be generated from workers' trips to and from the site via private vehicles and public transport.

The Preliminary Construction Management Plan (PCMP) prepared by Waterman Moylan in August 2022 sets out the measures which should be included in the Contractor's Construction Management Plan (CMP) and in the Contractor's Construction Traffic Management Plan (CTMP). Two inbound and two outbound construction traffic routes are proposed for the subject site. Alternative routes are also available.

Once these measures are implemented and managed in accordance with the CMP and CTMP, it is considered that the effects will be Imperceptible and short-term in duration. Therefore, they are considered to be not significant.

Operational Phase

This section of the EIAR sets out how the predictions of the trips generated by the Proposed Development were arrived at and their impact on the road network and public transport. The assessment included consideration of potential impacts to public transport (light rail and bus).

The overall impact of the Proposed Development on the public transport services in the surrounding area is an increase of 1.3% on Luas services and 6% on bus services. These increases are well within the capacity of both services. The impact of the Proposed Development on public transport services will be nominal resulting in effects that are imperceptible.

The network assessment indicates that the junctions assessed will remain under capacity in 2026 through to 2041 with the development in place, indicating that there are non-significant effects during operations.

The TTA for this development has considered two alternative scenarios as part of the assessment of the traffic impact. Firstly, it has assessed the traffic impact of the Proposed Development on the Application Site. Secondly, it has assessed the Proposed Development (Carmanhall Road SHD 2022) in combination with the adjacent Tack Sandyford SHD proposals, given that it is hoped that the two developments can be delivered together as one masterplan, subject to planning.

The results of the assessment confirmed that the junctions on the surrounding road network would remain within in capacity post development in in the Opening Year 2026 through the Design Year in 2031 to the Future Year 2041.

Accordingly, the traffic impact of the Proposed Development will be nominal resulting in effects that are Imperceptible. Therefore, predicted effects are considered to be not significant.

Mitigation and Management

For construction phase, a Preliminary Construction Management Plan (pCMP) has been prepared by Waterman Moylan on behalf of Atlas GP Ltd to accompany a planning application for a residential development on a brownfield site at the junction of Carmanhall Road and Blackthorn Road, Sandyford, Dublin 18. The Plan describes the Proposed Development and specifies the measures to be adopted to mitigate the impacts of construction.

For operational phase, A Travel Plan (formerly referred to as a Mobility Management Plan) has been prepared by Waterman Moylan on behalf of Atlas GP Ltd to accompany a planning application) for a residential development on a brownfield site at the junction of Carmanhall Road and Blackthorn Road, Sandyford, Dublin 18.

Since there are no significant effects anticipated, no monitoring is proposed with respect to effects from construction or operational traffic associated with the Proposed Development. Monitoring of travel patterns will be undertaken in the usual way as part of the Travel Plan.

Residual Effects

Once the standard management measures, appropriate design standards and operational management plans are adhered to it is considered that any impacts on the traffic and transport surrounding the Proposed

Development will be negligible and any effects Imperceptible. Therefore, predicted effects are considered to be not significant.

12.0 WIND MICROCLIMATE

A wind and micro-climate assessment has been conducted to identify the possible wind patterns around the Proposed Development considering mean and peak wind conditions typically occurring in Dublin. The criteria of Lawson's Wind Comfort and Distress have been adopted to determine if a specific area of the Proposed Development should be comfortable and safe to pedestrians for its designated activity (i.e. standing/walking/strolling).

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

Impact Assessment and Mitigation Measures

The wind profile of the baseline environment has been built using the annual average meteorology data collected at Dublin Airport Weather Station. The prevailing wind directions for the site are identified as West, South-East and West-South-West, with magnitude of approximately 6m/s. A CFD numerical model was built, where the typical winds conditions were applied on the area around the Proposed Development, both considering the baseline scenario both considering the impact of the proposed development in a cumulative assessment.

The results of the wind speeds and patterns formed under the different simulated wind conditions were combined with the frequency of occurrence of the same and an overall wind map was produced (Lawson map) which has shown the suitability of each area to a specific pedestrian activity.

To further investigate the impact of the height proposed for this development on the local wind microclimate, an additional wind analysis has been carried out where the proposed development having Block E of 16 storeys and Block D of 9-10 storeys, has been compared with the wind microclimate obtained on an "alternative design" where Block D and Block E are both reduced to a max of 9 storeys, thus similar to the height of Block G and Block F.

Construction phase

As construction of the Carmanhall Road SHD 2022 progresses, the wind conditions at the site would gradually adjust to those of the completed development. During the construction phase, wind conditions will be in line with the baseline wind microclimate and the effect on potential receptors (pedestrians) can be considered negligible. Furthermore, the areas more sensitive for receptors are potentially not going to be used until construction will be finalised.

Operational phase

The wind flow results obtained simulating the different direction and wind speeds, are combined with wind frequencies of occurrence to obtain comfort ratings at pedestrian level in all areas included within the model. The comparison of comfort ratings with intended pedestrian activities is shown in the Lawson Comfort and Distress Map that follows. The following conclusions can be made observing the results of the wind microclimate analysis and comparing the results obtained, under the same wind conditions for the baseline scenario versus the Proposed Development scenario in a cumulative assessment:

- The proposed development does not impact or give rise to negative or critical wind speed profiles at the nearby adjacent roads, or nearby buildings. Moreover, in terms of distress, no critical conditions were found

for “Frail persons or cyclists” and for members of the” General Public” in the surroundings of the development.

- The development is designed to be a high-quality environment for the scope of use intended of each areas/building (i.e., comfortable, and pleasant for potential pedestrian).
- The assessment of the proposed scenario has shown that no area is unsafe, and no conditions of distress are created by the proposed development.

An assessment of the Proposed Development on the on-site receptors (pedestrian areas, roads, entrances) and on the off-site receptors (roads/ pedestrian areas off-site on the north, south, west and east directions) and the impact has concluded that conditions will be suitable or calmer than required for the intended use of the receptors.

During construction phase, the wind conditions at the Site would gradually adjust to those of the completed development during the construction phase and no mitigation is proposed. During operational phase, no mitigation is proposed as safety and pedestrian comfort is maintained in accordance with Lawson Comfort and Distress Criteria. No monitoring is proposed during construction phase or operational phase.

Residual Effects

Predicted residual effects are considered to be not significant.

Wind cannot be eliminated or totally mitigated as it depends on weather conditions which could vary. The data of the historical wind conditions shows that the wind speeds likely to occur on the site are below critical values and that pleasant and comfortable microclimate can be maintained for most of the time and under the most frequent wind scenarios.

Gusts and storms can still occur however, and they can create unpleasant and sometimes unsafe conditions. The pedestrian activities concerning the Lawson Comfort and Distress Criteria are not in general carried out during those weather conditions.

13.0 LANDSCAPE AND VISUAL

The impact of the Proposed Development on Landscape / Townscape has been considered at both construction stage and operational stage of the Proposed Development. It has also been considered in respect of physical effects on the landform and land cover of the Site as well as the contribution of the Proposed Development to wider townscape fabric and character.

Impact Assessment and Mitigation Measures

There will be permanent physical effects to the land cover of the site resulting from the demolition of the previously existing industrial warehouses and office building, but these are of low quality and do not make a distinctive or positive contribution to the urban fabric of Sandyford. There is a cluster of existing trees just to the northwest of the site, that are identified in the CDP for protection, and these will be retained and protected during the construction stage for later incorporation as a pocket park[2] which also integrates with street frontage tree and shrub planting to the south and east. The landscape impacts during the short-term construction stage will be limited as it is within a medium to high density urban business district where such activity is a regular, on-going, occurrence. The Proposed Development will add a noticeably increased scale and intensity of built development to this site and its immediate surroundings, but in the context of other tall and bulky buildings fronting the western side of Blackthorn Road and northern side of Carmanhall Road. Indeed, it will generate an

[2] Note: the pocket park is proposed as part of the separate Tack Sandyford SHD application and it is located outside of the Planning Application Boundary of the Carmanhall Road SHD 2022.

infill link between these clusters of taller buildings, where currently there is something of a latent, perceptual void in the urban fabric of the Sandyford Core area.

The visual impact of the Proposed Development was assessed from 16 viewpoints representing a range of receptors, viewing distances and directions within and around the Sandyford Business District. The range of receptor sensitivity at viewpoints varied between Low within the business district, medium-low within surrounding residential areas where the business district already influences views and High-medium from two designated scenic routes within the foothills of the Dublin Mountains. It should be noted that there are not considered to be any issues with potential overlooking from the Proposed Development as it is surrounded on two sides by business park roads and on other sides by mid-rise commercial developments and a vacant site. Thus, there are no low-rise residential developments in the vicinity, where residential amenity could be significantly impacted by potential overlooking from the Proposed Development.

The significance and quality of visual impacts ranged across the viewpoint set between Slight / Negative at one location (VP6). At all other VP locations, the significance ranged between Moderate-slight and Imperceptible and in most cases the quality of effect is deemed to be positive or Neutral. From the elevated VP6 at Leopardstown Rise on the opposite side of the M50, the Proposed Development is considered to contribute a Slight / Negative visual impact. In this particular instance the uppermost sections of the proposed buildings partially obscure the view towards Dublin Bay and Howth Head. A similar but less noticeable effect Slight-imperceptible / Negative occurs at VP13 within the Dublin Mountains. From VP11 within the grounds of Burton Hall Hospital, the proposed landmark building (Block E) rises between intervening trees with little contextual legibility and thus, a Slight-imperceptible / Negative effect is also attributed in this case.

From those viewpoints within the Sandyford business district, the development is generally considered to contribute a Positive quality of change even where the degree of change is distinct. The development and in particular, the land mark building (Block E) serves to consolidate and enhance the profile of the Sandyford business district when approaching from the east (VP1 and VP12) and represents the physical manifestation of the zoning and policy context for this locality.

Overall, it is considered that the Proposed Development will not give rise to any significant townscape or visual effects. Instead, such effects will generally be imperceptible or result in enhancement of the townscape and visual setting. It is important to reiterate, particularly for this scale of development, that ‘Imperceptible’ significance is not tantamount to a barely discernible degree of visual change. In its own right the Proposed Development is not particularly prominent or distinctive, but it is considered to have a positive influence on the adjacent street scenes.

Residual effects

On the basis that there are no specific landscape and visual mitigation measures proposed, the impacts assessed in the Section 13.6 of the EIAR (i.e. the Landscape/townscape Impacts and Visual Impact Assessment) are considered to be the residual effects of the development:

- For Landscape/Visual significance, the combination of a ‘Medium-low’ townscape sensitivity judgement and a ‘Low’ magnitude of impact on the townscape character is considered to result in a Slight significance and Positive quality of impact at operational stage.
- For Landscape/Visual significance at construction phase, it is considered that where visible, the construction stage visual impacts will be in general accordance with the townscape impacts predicted in that section i.e. Slight significance of a Negative quality, but of a Short-term duration.
- For Landscape/Visual significance at operational phase, assessment has been carried out in respect of each representative viewpoint ranging from Sligh Negative to Moderate-slight / Positive.

Overall, it is considered that the Proposed Carmanhall Road SHD 2022 Development will not give rise to any significant townscape, visual or cumulative impacts.

14.0 MATERIAL ASSETS

This assessment has addressed the construction and operational related impacts of the Proposed Development on material assets located in the vicinity of the Application Site. Material assets comprise the physical resources in the environment, which may be of human or natural origin. Material Assets in the vicinity of the Site comprise of built services and infrastructure such as surface water drainage, telecommunications (including microwave linkages), electricity, gas, water supply infrastructure and sewerage. Other Material Assets include traffic and transport which have been assessed in a separate assessment.

All works to the electrical, gas and telecommunication lines during the construction phase will be carried out in accordance with appropriate requirements and Electricity Supply Board (ESB) Network, Gas Networks Ireland (GNI) and telecommunication service provider guidelines. Locations and capacity of the network services will be agreed in consultation with ESB Networks. There will be 2 no new ESB sub-stations provided within the footprint of the development. The development will also include Electric Vehicle charging points to 25 no. spaces. There will be an increased demand in electricity supply required during the operational phase of the Proposed Development. IN2 have been in contact with the ESB and it was identified that there are currently no issues with the provision of the required power to the Proposed Development.

As gas supply is not required for the development there will be no impacts from increased demand in gas supplies required during the operational phase of the Proposed Development. It should be noted that initial contact has been made with Gas Networks Ireland who have provisionally confirmed that sufficient capacity exists locally to serve the proposed development.

Eir and Virgin Media have also confirmed that their infrastructure to the surrounding area is sufficient to service the Proposed Development, subject to final agreement. The microwave links surrounding the Site (operated by Three and Vodafone) will experience impact or diffraction due to the presence of the Proposed Development. The proposed design provides for infrastructure on the plant screen of Block C to mitigate any impacts on these microwave links.

Water supply for the Proposed Development is intended to be from the mains and Irish Water has indicated that this is possible without an upgrade to the existing infrastructure (Irish Water, letter reference CDS21008079, dated 25 January 2022). The storm and foul water connections have also been confirmed by Irish Water as being feasible (Irish Water, letter reference CDS21008079, dated 25 January 2022). The surface and storm water from the site will be discharged into the existing storm water network. Foul water will be discharged via a new connection to the existing 225 mm diameter clay wastewater sewer in Arkle Road, as recommended in the confirmation of feasibility from Irish Water (Irish Water, letter reference CDS21008079, dated 25 January 2022).

Impact Assessment and Mitigation Measures

For the assessment of potential impacts at construction and operational phases, it has been assumed that the value (sensitivity) of the material assets is no greater than Medium, which equates to ‘Medium or high importance and rarity, regional scale, limited potential for substitution’. This sensitivity has been assumed given the importance of the assets to users surrounding the Proposed Development, and their sensitivity to potential disruption from the impaired use.

Construction Phase

Electricity: All works to the electrical power lines during the construction phase will be carried out in accordance with appropriate requirements and ESB Network guidelines. Locations and capacity of the network services will

be agreed in consultation with ESB Networks. With the required construction management controls, potential impacts from these connection activities on the local electrical supply network are likely to be *Negligible* resulting in effects that are brief/temporary and *Imperceptible*.

Gas: As gas supply is not required for the development there will be no network connection activities and therefore no predicted impacts on the gas network. Works on and around the gas transmission lines will be conducted in accordance with the Main Contractor's final Construction Management Plan and appropriate GNI guidance, including 'Safety advice for working in the vicinity of natural gas pipelines'.

Wired Telecommunications: As construction works would be managed effectively and in accordance with provider practices it is considered that any negative impacts would be Negligible. The effects would be brief/temporary and Imperceptible to the surrounding users.

Microwave Link/Channel and Cellular Networks: Any construction work to install the microwave link dishes will be managed effectively and in consultation with the relevant operators and it is considered that any negative impacts would be Negligible. The effects would be brief/temporary and Imperceptible to the surrounding users.

Foul Water Network: As construction works would be managed effectively and in accordance with the CMP it is considered that any impacts would be Negligible. Effects will be brief/temporary and Imperceptible to the surrounding users.

Potable Water Network: Works on and around the water supply network will be conducted in accordance with the Main Contractor's final Construction Management Plan and the appropriate Irish Water Code of Practice. As works would be managed effectively and in accordance with the Main Contractor's Construction Management Plan it is considered that impacts would be Negligible. Effects will be brief/temporary and Imperceptible to the surrounding users.

Surface Water Drainage Infrastructure: As construction activities would be managed effectively and in accordance with the Main Contractor's CMP and Construction Environmental Management Plan (CEMP) it is considered that any negative impacts will be Negligible. Effects will be brief/temporary and Imperceptible to the surrounding users.

Operational phase

Electricity: There will be an increased demand in electricity supply required during the operational phase of the Proposed Development. Initial contact has been made by IN2 with the ESB and it was identified that there are currently no issues with the provision of the required power to the Proposed Development. The potential impacts from the increased electricity demand on the local electrical supply network are therefore likely to be *Negligible* resulting in effects that are Permanent and *Imperceptible*.

Gas: As gas supply is not required for the development there will be no impacts from increased demand in gas supplies required during the operational phase of the Proposed Development

Wired Telecommunications: During the operational phase of the Development, it is considered that there will be a positive long-term/permanent impact on the telecommunication services surrounding the Site. Impacts on demands of the network are considered to be Negligible and effects Imperceptible and long term/permanent.

Microwave Link/Channel and Cellular Networks: Microwave link dishes and supports installed during the construction phase will be managed in the transition to and during the operational phase of the Proposed Development. Maintenance of the microwave linkage infrastructure during the operational phase will be carried out by the relevant operators and facilitated by the Property Management Company. By providing the mitigating infrastructure, during the operational phase of the Proposed Development, it is considered that impacts on the microwave linkages will be Negligible and effects Imperceptible and long-term/permanent and positive.

Foul Water Network: The foul water design has been undertaken following Irish Water's Code of Practice for Wastewater Infrastructure. Potential impacts on the local foul water network are likely to be Negligible and effects permanent and Imperceptible.

Potable Water Network: The total water requirement from the public supply, for the development, is estimated at 139 m3/day. The potential impacts from the increased demand on the water supply network are likely to be Negligible and effects Permanent and Imperceptible.

Surface Water Drainage Infrastructure: The proposed surface water drainage system for this development has been designed as a SUDS system (in accordance with the Greater Dublin Strategic Drainage Study) and uses permeable paving, green roofs/green podium, bio-retention tree pits rain garden, below ground attenuation together with flow control devices and petrol interceptor to treat run-off and remove pollutants to improve quality, restrict outflow and control quantity. With the appropriate design mitigation, the potential impacts on the surrounding surface water drainage network will be *Negligible* and effects permanent and *Imperceptible* and positive.

Mitigation and management

To mitigate the effects associated with the potential impacts on material assets surrounding the Proposed Development, the following embedded mitigation and additional mitigation will be undertaken:

- A site-specific Construction Management Plan and associated Construction Environmental Management Plan will be developed, and implemented prior to the commencement of works, and implemented and updated throughout the construction phase of the Development;
- Pre-construction consultation and authorisation will be achieved for all of the relevant infrastructure connections;
- Any works required to material assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to material assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- SuDS features will be maintained appropriately throughout the operational phase of the Development by the relevant management body; and
- Efficiencies in water usage should be considered throughout the engineering design and construction phase of the Proposed Development.
- Utilities infrastructure providers (ESB, GNI, etc) will have 24/7 emergency access to appropriate utilities infrastructure on the site.

Any monitoring associated with authorisation or consents (e.g. construction discharges or those associated with operational activities) will be incorporated into the Main Contractor's CMP and CEMP and will be adhered to.

Residual Effects

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to it is considered that any impacts on the material assets surrounding the Proposed Development will be Negligible and any effects Imperceptible. Therefore, predicted effects are considered to be not significant.

15.0 INTERACTIONS, CUMULATIVE AND COMBINED EFFECTS

This chapter of the EIAR describes interactions/inter-relationships between environmental effects and also effects of the Proposed Development in combination with other appropriate committed development in the region of the Site. The overall objective of this assessment is to identify, through a review of these issues, whether additional mitigation is required that would not otherwise have been identified in the individual study areas for these interacting or cumulative effects.

This assessment uses a common framework of assessment criteria and terminology which is based on the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the Environmental Protection Agency (EPA) (EPA 2022)[3]. For the assessment of cumulative and combined effects, the selection of relevant development schemes has included substantive schemes that have planning permission or are under construction within 1 km of the Proposed Development. These selected schemes have been identified as it is considered that they are of sufficient size, scale and distance from the Proposed Development to be assessed for potential cumulative effects. Additionally, the Tack Sandyford SHD has been included within the assessment, given this project has been designed to complement the Prosed Development as part of an overall masterplan.

Interactions and Inter-relationships

Interactions of EIA study topic areas are typically displayed visually in a matrix table which identifies potential interactions which are likely to occur between the various disciplines. The assessment did not identify any additional potential for impacts further to those that had been identified in previous chapters of the EIAR.

Cumulative and Combined Effects

The discipline specific cumulative effects assessment are typically displayed visually in a matrix table which identifies potential interactions which are likely to occur between the various disciplines and projects. With the adoption of standard best practice construction management, no significant cumulative effects were noted further to those that had been identified in preceding chapters of the EIAR.

16.0 MITIGATION AND MONITORING MEASURES

The purpose of this chapter is to collate the mitigation and monitoring measures identified in the EIAR that are considered necessary to protect the environment prior to, and during the construction and operational phases of the Proposed Development. Where environmental impacts cannot be avoided by embedded mitigation, additional mitigation and monitoring measures have been recommended in the EIAR. The presentation of additional mitigation measures in the tables presented in Chapter 16 of the EIAR is intended to assist the planning authority in its decision making role. Chapter 16 brings together monitoring specifically required within the EIAR and as set out in the other EIAR chapters (e.g. specialist technical discipline assessments).

Where appropriate, environmental monitoring activities have been proposed for the construction and operational phases. Monitoring will take place after the consent is granted for the Proposed Development to provide assurance that aspects of the design and management are functioning as intended and therefore not generating significant effects.

17.0 SUMMARY AND CONCLUSIONS

The likely significant effects on the environment have been properly assessed in the EIA process and this will inform the Boards own EIA.

[3] Exceptions where topic-specific criteria have been adopted for cumulative impact assessment to align with EIA assessment are identified and described in the EIAR chapter.

The findings of the EIA process are fully documented in the EIAR accompanying the planning application.

Measures have been identified to avoid or reduce environmental impacts during construction and operation of the Proposed Development. Some of these form part of the design of the Proposed Development itself. Others, such as management plans, will be secured by provisions in planning conditions of the final grant.