

Alanna Homes and Alcove Ireland Four Ltd.

Barnhill Garden Village Strategic Housing
Development at Barberstown, Barnhill and
Passifyoucan, Clonsilla, Dublin 15

Non Technical Summary

Volume I



AECOM

ALANNA
HOMES

Alcove Ireland
Four Limited

Clifton Scannell Emerson
Associates

Delphi Architects

JOHN CRONIN & ASSOCIATES
ARCHAEOLOGY | CONSERVATION | HERITAGE | PLANNING

SLR

July 2022

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS



Non-Technical Summary

Contents

1	Introduction to EIAR	6
1.1	Introduction	6
1.2	Development Description	6
1.3	Background and Purpose of the EIAR	7
1.3.1	Screening for EIA	7
1.4	Methodology	7
1.4.1	Study Area	8
1.4.2	Report Structure	8
1.5	Design Team and Competency	8
1.5.1	EIAR Co-Ordinator and Study Team	8
1.6	Consultation	9
1.7	Cumulative Impacts	9
2	Project Description	10
2.1	Introduction	10
2.2	Existing Environment	11
2.3	Description of Proposed Development	11
2.4	Phasing	11
2.5	Construction Processes	12
2.6	Operational Stage Waste Management	12
3	Alternatives Considered	12
3.1	Introduction	12
3.2	Methodology	12
3.3	Do Nothing Alternative	13
3.4	Alternative Locations	13
3.5	Alternative Layout	13
3.6	Alternative Design	15
3.7	Mitigation Measures	15
4	Landscape and Visual Impact	15
4.1	Introduction and Methodology	15
4.2	Policy Context	16
4.3	Description of Existing Environment	17
4.3.1	Landscape Baseline	17
4.3.2	Visual Baseline	18
4.3.3	Sensitive Receptors	18
4.4	Impact assessment	19
4.4.1	Aspects of the Development Which Have the Potential to Cause Landscape and Visual Effects	19
4.4.2	Landscape Effects	19

4.4.3 Visual Effects.....	20
4.4.4 Cumulative Impacts.....	20
4.5 Mitigation Measures	21
5 Material Assets: Traffic and Transportation	21
5.1 Introduction.....	21
5.2 Assessment Methodology	22
5.2.1 Baseline Traffic Counts	22
5.2.2 Road Assignment.....	22
5.2.3 Future Road Network Assumptions	22
5.2.4 Mode Share	22
5.2.5 Proposed Development Occupancy Data Assumptions and Trip Generation.....	22
5.2.6 Hansfield SDZ Development and Kellystown LAP Lands Population Assumptions.....	23
5.2.7 Assessment Years and Scenarios	23
5.2.8 Assessment Junctions.....	23
5.3 Existing Conditions.....	23
5.3.1 Existing Public Transport Services.....	24
5.3.2 Existing pedestrian and cyclist facilities	24
5.4 Future Receiving Environment.....	24
5.4.1 Public Transport	24
5.5 Proposed Development Movement Strategy	25
5.5.1 Internal Pedestrian/Cyclist Network and Circulation.....	25
5.5.2 Pedestrian/Cyclists Connection to Hansfield and Royal Canal Greenway.....	25
5.5.3 Internal Vehicular Circulation	25
5.5.4 Proposed Barberstown Lane North Layout.....	25
5.5.5 Access to Existing Houses Within the Site.....	25
5.6 School/Creche Access	25
5.7 Proposed Car Parking and Cycle Parking Strategy	26
5.7.1 Car Parking	26
5.7.2 Cycle Parking	26
5.7.3 Hansfield Station Commuter Cycle Parking.....	26
5.8 Shared Driving Scheme (Go-Car).....	26
5.9 Amenities in Local Area.....	26
5.10 Predicted Impacts of The Development.....	26
5.10.1 Construction Stage Impact.....	26
5.10.2 Operational Impacts	27
5.10.3 Cumulative Impacts	27
5.11 Mitigation Measures	27
6 Material Assets, Service Infrastructure and Utilities.....	27
6.1 Introduction.....	27
6.2 Assessment Methodology	28
6.3 Existing Environment Material Assets.....	28
6.4 Description of Future Receiving Environment.....	28

6.5	Proposed Development.....	29
6.6	Potential Impacts and Mitigation Measures – Construction Stage	30
6.7	Potential Impacts and Mitigation Measures – Operational Stage	30
6.8	Monitoring – Construction Stage.....	31
6.9	Monitoring – Operational Stage	31
7	Land.....	31
7.1	Introduction.....	31
7.2	Methodology.....	31
7.3	Potential Impacts.....	31
7.4	Mitigation Measures	31
7.5	Residual Impacts.....	31
8	Water.....	32
8.1	Introduction.....	32
8.2	Methodology.....	32
8.3	Potential Impacts.....	32
8.4	Mitigation Measures	32
8.5	Residual Impacts.....	32
9	Biodiversity	32
9.1	Introduction.....	32
9.2	Methodology.....	32
9.3	Baseline environment.....	33
9.4	Potential impacts and mitigation	34
10	Noise and Vibration	35
10.1	Construction Phase – Noise and Vibration	35
10.2	Operational Phase – External	35
10.3	Operational Phase – Internal	35
10.4	Cumulative Impacts.....	35
11	Air Quality.....	35
11.1	Introduction.....	35
11.1.1	Scope of the Assessment.....	35
11.2	Assessment Methodology	35
11.2.1	Baseline Evaluation	35
11.2.2	Construction Phase Impact Assessment.....	36
11.2.3	Operational Phase Impact Assessment	36
11.3	Baseline Air Quality	36
11.4	Construction Impacts.....	36
11.5	Operational Impacts	36
11.6	Mitigation Measures and Residual Impacts	37
11.6.1	Construction Phase	37
11.6.2	Operational Phase.....	37
11.7	Cumulative Impacts.....	37
11.7.1	Construction Phase	37

11.7.2 Operational Phase.....	37
12 Climate Change.....	37
12.1 Introduction.....	37
12.2 Methodology.....	37
12.3 Existing Environment.....	37
12.4 Potential Impacts – Construction	38
12.5 Potential Impacts – Operational	38
12.6 Mitigation Measures	38
12.7 Monitoring.....	38
13 Cultural Heritage	38
14 Population and Human Health	39
14.1 Introduction.....	39
14.2 Methodology.....	39
14.3 Existing Environment.....	40
14.3.1 Population.....	40
14.4 Impact Assessment.....	40
14.4.1 Do Nothing Scenario	40
14.5 Construction Phase Impacts	41
14.6 Operational Phase.....	41
14.7 Cumulative Impacts.....	42
14.7.1 Construction Phase	42
14.7.2 Operational Phase.....	42
14.8 Mitigation	42
14.9 Monitoring.....	42
14.10Residual Impacts.....	43
15 Major Accidents and Disasters.....	43
15.1 Introduction.....	43
15.2 Methodology.....	43
15.3 Existing Environment.....	43
15.4 Potential Impacts – Construction	43
15.5 Potential Impacts – Operation	44
15.6 Potential Impacts – Cumulative.....	44
15.7 Mitigation Measures	44
16 Significant Interactions of Impacts	44
17 Schedule of Mitigation Measures and Monitoring	44

Tables

Table 1.1 EIAR Design Team	8
Table 1.2 Cumulative Projects	10
Table 5.1 Potential Impacts during Construction Stage.....	26
Table 6.1 Potential Impacts and Mitigation Measures – Construction Stage	30
Table 6.2 Potential Impacts and Mitigation Measures – Operational Stage.....	30

Table 11.1 Risk of Dust Impacts – Unoccupied (Unmitigated)	36
Table 11.2 Risk of Dust Impacts – Occupied (Unmitigated)	36

Figures

Figure 1.1 Location of Subject Site (indicatively shown by red star)	6
Figure 1.2 Proposed Site Layout Plan	7
Figure 3.1 Barnhill: Alternative 1	14
Figure 3.2 Barnhill Layout – Alternative 2	14
Figure 3.3 Barnhill Layout – Alternative 3 – the Preferred Option (Planning Application).....	15

1 Introduction to EIAR

1.1 Introduction

The preparation of a Non-Technical Summary (NTS) is a requirement under the EIA directive as one of the fundamental objectives of the EIA process is to “ensure that the public are made aware of the environmental implications of any decisions about whether to allow new projects to take place”.

This NTS provides a concise and comprehensive summary of the assessments carried out, a description of the project, its existing environment, the effects of the proposed project on the environment, the proposed mitigation measures and the proposed monitoring arrangements, where relevant.

The Environmental Impact Assessment Report (EIAR) sets out the results of the environmental assessments which have been completed for the proposed development to inform the planning consent process.

The assessment has been completed as a statutory environmental assessment. The environmental impact assessment process has been completed in line with Directive 2014/52/EU, based on the guidance presented in Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (EPA, May 2022).

Chapter 1 introduces the project and describes the scope and methodology of the EIA process. The consultation process which was undertaken is outlined and the environmental assessment team is also introduced. Chapter 2 provides information on the background to the project and the site context, and Chapter 3 provides details of the proposed development.

1.2 Development Description

Alanna Homes and Alcove Ireland Four Ltd. are applying for permission for the construction of a Strategic Housing Development (SHD) within the townlands of Barberstown, Barnhill, and Passifyoucan at Clonsilla, Dublin 15. The development is to consist of 1,243 residential units, commercial and community units. A description is set out in detail in Chapter 2 Project Description of the EIAR and section 2 of this NTS.

The location and site context of the site is shown at Figure 1.1 and the site layout is shown at Figure 1.2

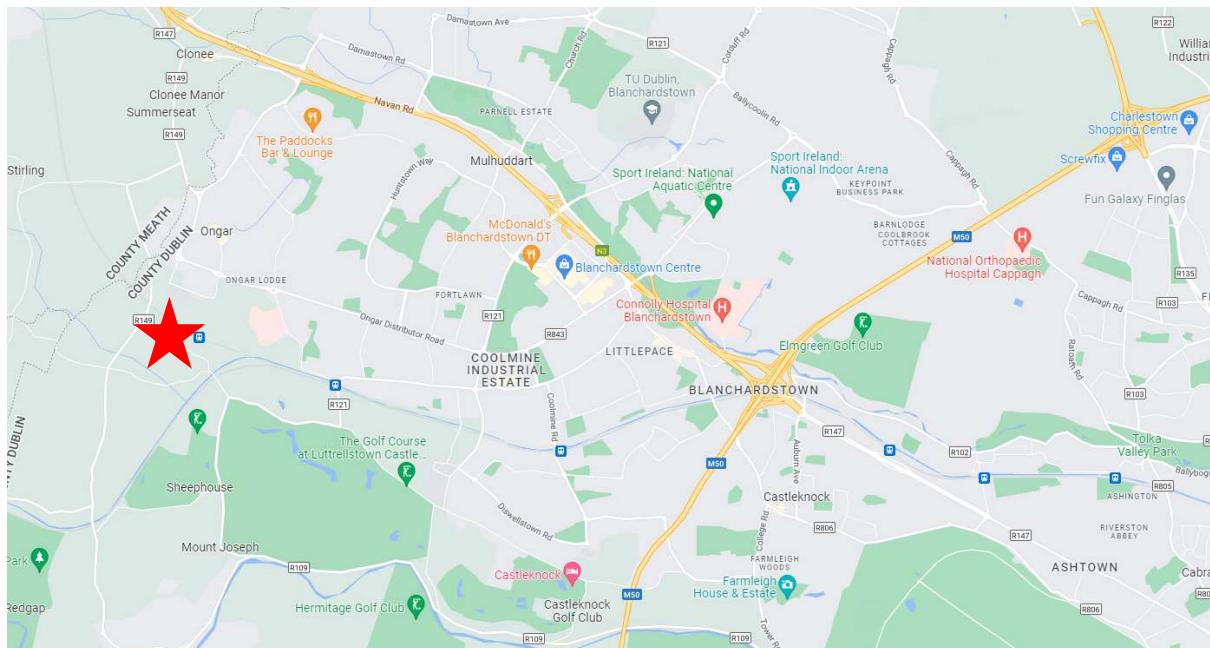


Figure 1.1 Location of Subject Site (indicatively shown by red star)

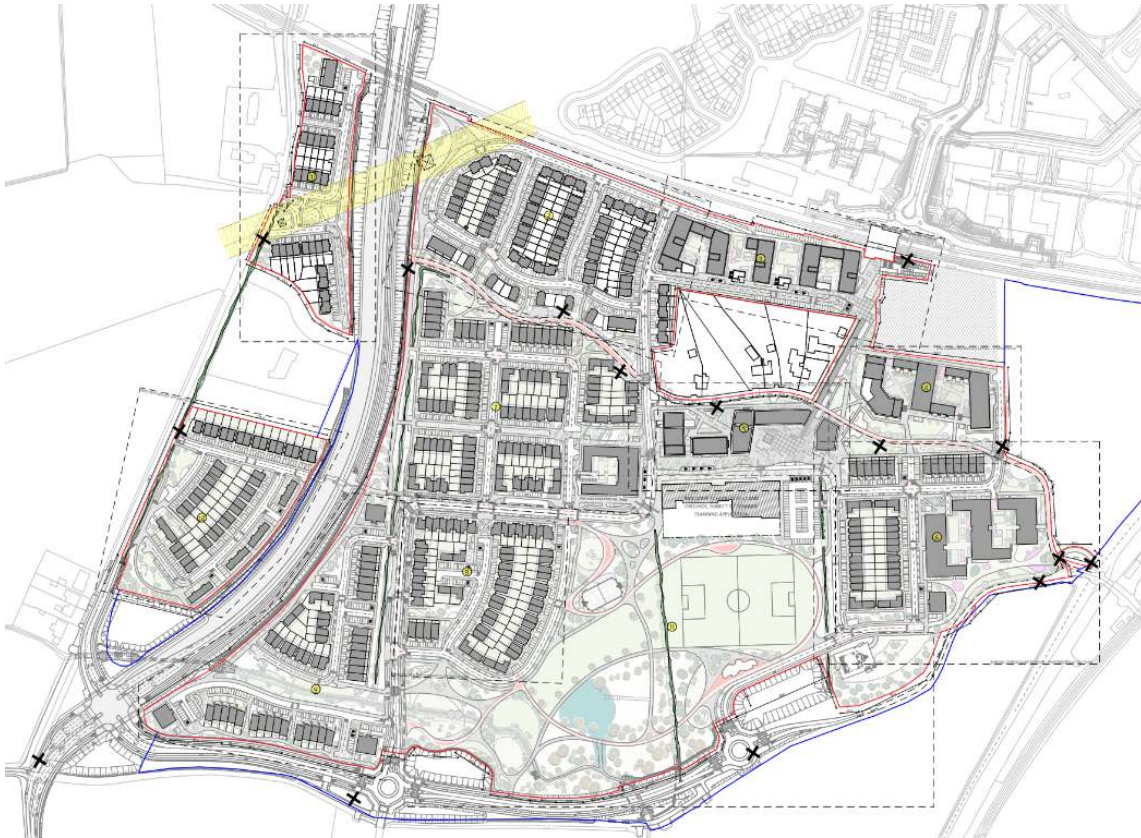


Figure 1.2 Proposed Site Layout Plan

1.3 Background and Purpose of the EIAR

1.3.1 Screening for EIA

The proposed development falls within the class of development types requiring an Environmental Impact Assessment (EIA) under Schedule 5 of the Planning and Development Regulations (as amended). The proposed development is subject to Section 10, part 2 of Schedule 5, which deals with infrastructure projects where EIA is required:

“10. (b) (i) Construction of more than 500 dwellings.

(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

(In this paragraph, “business district” means a district within a city or town in which the predominant land use is retail or commercial use.)”

It is considered that the Barnhill site constitutes a ‘built-up area’, given its proximity to Hansfield SDZ and therefore the threshold in terms of hectares for requiring an EIA is 10 hectares.

The proposed development includes the construction of 1,243 residential units, on a site area of 29.6 hectares. A mandatory EIAR is therefore required under the provisions of Schedule 5, Part 2, Section 10 (b) (i) and (iv) of the Planning and Development Regulations 2001 (as amended).

1.4 Methodology

The EIAR has been prepared in accordance with the requirements set out in the amended Directive as transposed into Irish Legislation, i.e., the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended) and having regard to the Environmental Protection Agency (EPA), Guidelines on the Information to be Contained in Environment Impact Assessment Reports, EPA May 2022.

1.4.1 Study Area

The study area is defined individually for each environmental discipline, according to guidance and the geographic scope of the potential impacts or the information required to assess those impacts. Details are provided by each discipline as part of the description of the existing environment and methodology.

Development boundary lines shown within each chapter of the EIAR are indicative. The 'red-line' boundary of the planning application is illustrated in Figure 2.2 of Chapter 2, and on the site location and site layout drawings which accompany the application.

1.4.2 Report Structure

The EIAR has been prepared according to the 'Grouped Format Structure'. This means that each topic is considered as a separate section and is drafted by relevant specialists.

The EIAR is divided into three Volumes as follows:

- Volume I: Non-Technical Summary
- Volume II: Main Environmental Impact Assessment Report
- Volume III: Appendices to the Main Environmental Impact Assessment Report

1.5 Design Team and Competency

1.5.1 EIAR Co-Ordinator and Study Team

McCutcheon Halley Planning Consultants (MH Planning) are the planning consultants and project coordinators of the EIAR. The qualifications of consultants responsible for each discipline is provided in the introduction to the relevant chapter. Production of the EIAR has been co-ordinated by Màiri Henderson of McCutcheon Halley Planning Consultants (BA Hons, MRTPI, MIH); and Michelle O'Shea of McCutcheon Halley Planning Consultants, (BA Honours in Geography and MPlan Masters in Town Planning & Sustainable Development).

The EIAR structure and consultant responsible for each of the chapters is set out in Table 1.1.

Table 1.1 EIAR Design Team

Consultant	Chapters Prepared / Contributed
McCutcheon Halley Planning Consultants, 6 Joyce House, Barrack Square, Ballincollig, Cork. Email: info@mhplanning.ie	Chapter 1: Introduction Chapter 2: Project Description Chapter 3: Alternatives Considered Chapter 14: Population and Human Health Chapter 16: Significant Interaction of Impacts Chapter 17: Schedule of Mitigation Measures.
Delphi Architects, Unit 13, The Seapoint Building, 44-45 Clontarf Road, Clontarf, Dublin 3. Email: info@Davey-smith.com	Chapter 2: Project Description Chapter 3: Alternatives Considered
Clifton Scannell Emerson & Associates, Consulting Engineers, 3 rd Floor The Highline, Bakers Point, Pottery Road, Dun Laoghaire, Co. Dublin. Email: info@csea.ie	Chapter 2: Project Description Chapter 5: Traffic and Transport Chapter 6: Material Assets
AECOM, 9 th Floor, the Clarence West Building 2 Clarence St. W Belfast, Northern Ireland, BT2 7GP Email: info@aecom.com	Chapter 7: Land & Soils Chapter 8: Water Chapter 9: Biodiversity

	Chapter 12: Climate Change Chapter 15: Risk of Major Accidents and Hazards
SLR Consulting, 7 Dundrum Business Park, Windy Arbour, Dublin, D14 N2Y7 Phone: +353 1 296 4667	Chapter 4: Landscape & Visual Impact Chapter 10: Noise Chapter 11: Air Quality
John Cronin & Associates, 3a Westpoint Trade Centre, Ballincollig, Co. Cork Email info@johncronin.ie , and John Purcell, Archaeological Consultancy, Balinvalley, Killeigh, Tullamore, Co. Offaly Email: jparcnaeology@gmail.com	Chapter 13: Cultural Heritage

1.6 Consultation

The following prescribed bodies have been consulted in relation to the general scope of the EIAR and their responses are included at Appendix 1.1:

Prescribed Bodies / Agencies

1. Department of Housing, Local Government and Heritage (Development Applications Unit)
 - a. National Parks and Wildlife Service
 - b. National Monuments Service
2. Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media
3. Transport Infrastructure Ireland
4. National Transport Authority
5. Irish Water
6. Irish Rail
7. Commission for Railway Regulation
8. Waterways in Ireland
9. Heritage Council
10. Health & Safety Authority
11. Health & Safety Executive
12. An Taisce
13. Department of Education and Skills
14. Coras Iompair Eireann
15. Fingal Childcare Committee
16. Meath County Council
17. Kildare County Council
18. An Taisce
19. Bat Conservation Ireland
20. Birdwatch Ireland
21. Geological Survey Ireland
22. Inland Fisheries Ireland
23. Office of Public Works

1.7 Cumulative Impacts

The existing environment for the proposed development consists of the existing residential units immediately adjacent to the proposed development, including recent development in Hansfield SDZ. At the time of the preparation of the EIAR, several other developments were permitted within Hansfield SDZ, as detailed in Table 1.2.

Table 1.2 Cumulative Projects

Project	Applicant	Reference	Development
Hansfield SDZ	Mulberryglen Ltd.	FW15A/0161	206 units in Zone 2
	Mulberryglen Ltd.	FW16A/0117	47 units in zone 2
	Garlandbrook Ltd	FW16A/0123	219 units in zone 2 and zone 6
	Hansfield Investment Ltd	FW15A/0032	128 units in Zone 4
	Firth Development Unlimited Company	FW17A/0234	155 units, a childcare facility(c.198sq.m), public open space (c.9,310 sq.m) in Zone 6
	Garlandbrook Ltd	FW18A/0021	95 units in zone 6
	Hansfield Investment Ltd	FW18A/0161	247 units in Zone 7
	Hansfield Investment Ltd	FW18A/0162	62 Units, 2,470m ² commercial development including crèche (209m ²), community space (897m ²), in Zone 1
	Hansfield Investment Ltd	FW18A/0197	200 units in Zone 7
	Garlandbrook Ltd	FW18A/0110	618 units in zone 7, crèche (334.84m ²), retail/commercial units (596.06m ²)
	Hansfield Investment Ltd.	FW20A/0084	15 units, crèche (493) Place of Worship and a medical suite in Zone 1 and 7
	Garlandbrook Ltd.	FW20A/0059	83 units in Zone 7
	Firth Development UC	DAC/048/20	10 units in Zone 6
	Firth Development UC	DAC/047/20	22 units in Zone 6
	Firth Development UC	DAC/046/20	12 units in Zone 6

The Ongar-Barnhill Distributor Road has been approved under Part 8 and will be complete prior to the commencement of the proposed development. The Ongar-Barnhill Road has therefore been considered to form the 'future existing environment' and each discipline has assessed relevant impacts on the basis of the road being in place.

2 Project Description

2.1 Introduction

This chapter provides a description of the proposed development, phasing and construction activities and provides a summary of the Outline Construction Environmental Management Plan which accompanies the planning application.

2.2 Existing Environment

The application site is located in the townlands of Barberstown, Barnhill, and Passifyoucan, at Clonsilla, Dublin 15 and is situated approximately 3 km to the west of Blanchardstown Centre and approximately 12.4 km to O'Connell Street, Dublin.

As noted in the Barnhill Local Area Plan 2017 (Barnhill LAP), the lands are situated close to the western boundary of Fingal, where the administrative areas of Meath, Kildare, and Fingal meet. Hansfield Train Station is located between the Hansfield SDZ and the development site. The railway line provides suburban services to Dublin City Centre to the east, and Dunboyne to the west. The lands are also strategically located approximately 10km south-west of Dublin Airport and 2.6 km south of the M3 / N2 link with direct access to the strategic national road network.

2.3 Description of Proposed Development

The proposed development will consist of:

- (a) the demolition of the existing vacant industrial buildings;
- (b) the construction of 1,243 residential units comprising:
 - 322 dwelling houses comprising a mix of 3- and 4-bedroom detached, semi-detached and terraced units ranging in height from two to three storeys.
 - 117 duplex units comprising a mix of 1-, 2- and 3-bedroom units.
 - 804 apartments comprising a mix of 1-, 2-, 3- and 4-bedroom units ranging in height from two to twelve storeys.
- (c) The construction of commercial and community facilities including one creche; one medical centre; one café; one convenience retail unit; five commercial units; a community centre; and an Office Hub.
- (d) Land set aside for a primary school to accommodate a minimum of 16 classrooms;
- (e) Provision of four new vehicular accesses with two from the Part 8 approved Barberstown Lane South Upgrade and two from the R149; the creation of a pedestrian and cycling priority route along Barberstown Lane North, with vehicle use restricted to local access, and provision of a pedestrian access plaza from the site to the Hansfield train station to the north;
- (f) The provision of landscaping and amenity areas to include neighbourhood playgrounds; pocket parks with play areas; and park comprising a multi-use games area (MUGA), large field, playing pitch; skateboard park; play areas; and amenity trails;
- (g) Proposed underground diversion of a section of 10/20kV ESB overhead power line traversing through the northern part of the site and the retirement of its ancillary poles;
- (h) All associated infrastructure and ancillary development works to include the construction of electrical substations; construction of pumping station; drainage and services connections; internal roads; pedestrian footpaths, pedestrian bridges and cycle lanes, public lighting, utilities, landscaping and boundary treatments, bicycle and car parking including basement and under-croft parking, bike storage and bin storage.

An Environmental Impact Assessment Report and a Natura Impact Statement have been prepared in respect of the proposed development.

2.4 Phasing

The proposed development is estimated to commence in October 2024 with the provision of enabling works. The development will then consist of five main phase to run from February 2025 to July 2032. It is projected that construction works will be completed approximately 7 years and 10 months from commencement.

Supporting infrastructure is to be provided for each relevant phase. Table 2.4 of the main EIAR provides a detailed breakdown of the phasing.

2.5 Construction Processes

The construction process will be carried out in a series of stages:

- Site Mobilisation
- Demolition and Site Clearance Works
- Development of Site Infrastructure
- Construction of Housing Units and Village centre and delivery of site infrastructure.
- Landscaping
- Site De-mobilisation.

Section 2.4 of the EIAR provides a description of each of the construction stages. The construction process chapter also sets out:

- Proposed site compound locations
- Demolition and cut and fill volumes
- Construction Traffic Management, Site Access, and Parking arrangements.
- Construction Traffic Volumes and deliveries.

An outline Construction and Environmental Management Plan (CEMP) accompanies the planning application and takes account of the schedule of mitigation measures presented in the EIAR. The CEMP incorporates a Construction Traffic Management Plan and a Construction Waste Management Plan.

2.6 Operational Stage Waste Management

An outline Operational Waste Management Plan (OWMP) accompanies the application. The OWMP aims to provide a strategy to ensure maximum recycling, reuse, and recovery of waster with diversion from landfill where possible.

The OWMP provides calculations of the estimated waste to be generated by each use within the development on a weekly basis, summarised in table 2.7 of the EIAR. The OWMP also provides a description of the waste storage areas provided for the segregation of residual, recyclable and organic waste types throughout the development.

3 Alternatives Considered

3.1 Introduction

This chapter of the EIAR addressed alternatives considered for the proposed development.

3.2 Methodology

The methodology used to prepare this chapter has involved:

- Review of the detailed design of the proposed development.
- Review of reports and drawings prepared as part of the planning application process.
- Review of iterative designs developed during the preparation of the planning application

The amended EIA Directive requires an EIAR to contain:

“A description of the reasonable alternatives (for example in terms of project design, technology, 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.”

The EPA Guidelines emphasis that the amended Directive refers to ‘reasonable alternatives...’ which are relevant to the proposed project and its specific characteristics. The EPA Guidelines sets out the following alternatives which may be considered, but also note that in some instances, some of the alternatives described will not be applicable to every project:

- ‘Do-nothing’ Alternative’
- Alternative Locations
- Alternative Layouts
- Alternative Designs
- Alternative Process

As the proposed development does not involve any industrial processes, 'alternative process' are not considered within this chapter. Each of the other alternatives are considered in turn.

3.3 Do Nothing Alternative

Given the fact that the lands are zoned for Residential Development and that there is a shortage of housing supply in Fingal County Council's administrative area, should the proposed development not proceed it is likely that an alternative residential development proposal would be brought forward for consideration.

If no residential development proposal were to be brought forward, the lands would remain in agricultural use. The continued use of the lands for agriculture would be inconsistent with the policy objectives of the Fingal County Development Plan 2017 and the Barnhill LAP 2019. It would also result in lower patronage of the Hansfield Railway station and the Dunboyne to Clonsilla rail line, and would therefore be inconsistent with national, regional, and local policy objectives for enhanced use of sustainable transport modes.

3.4 Alternative Locations

The subject site is zoned in the Fingal County Development Plan 2017-2023 to provide for a new residential area. The Barnhill LAP sets out a vision for the site to develop a high quality new residential environment. The lands are adjacent to Hansfield SDZ and to the new Hansfield Railway station providing excellent sustainable transport links on the Dunboyne to Clonsilla rail line.

Given that the development of the lands is consistent with national, regional, and local planning policy, an alternative location for the proposed development was not considered.

3.5 Alternative Layout

A series of alternative layouts were considered throughout the design and pre-planning process. Chapter 3 of the EIAR set out the development principles which informed the alternatives considered and reasoning for revisions.

The three main alternatives considered are presented in Chapter 3 of the EIAR. Alternatives 1 (Figure 3.1) & 2 (Figure 3.2) were revised in line with the reasoning detailed in Chapter 3. The third alternative considered emerged as the preferred layout and is presented in Figure 3.3.

This preferred option emerged as most suitable because:

- It meets the main development principles of the site (as detailed in section 3.4 of the EIAR)
- It responded to the issues raised during the pre-planning consultation and EIAR consultation phase.



Figure 3.1 Barnhill: Alternative 1



Figure 3.2 Barnhill Layout - Alternative 2



Figure 3.3 Barnhill Layout – Alternative 3 – the Preferred Option (Planning Application)

3.6 Alternative Design

The applicant appointed three separate architectural practices to contribute to the design of the proposed development. The design of individual units and landscaping proposals was refined and revised within each character area having regard to issues raised throughout the design process. Table 3.1 of the EIAR provides a summary of the alternative designs considered during the development of the planning application.

3.7 Mitigation Measures

The preferred layout option is as detailed in Figure 3.3 and accompanying planning drawings and particulars. The significant impacts and appropriate mitigation measures associated with the proposed development are detailed in the relevant discipline chapters throughout the EIAR. Chapter 17 provides a schedule of all mitigation measures proposed.

4 Landscape and Visual Impact

4.1 Introduction and Methodology

A landscape and visual impact assessment (LVIA) of the proposed Strategic Housing Development (SHD) at Barnhill, Dublin 15, to be known as Barnhill Garden Village, was completed in accordance with accepted guidance, i.e. the Third Edition of the Guidelines for Landscape and Visual Impact Assessment issued by the Landscape Institute and Institute of Environmental Management and Assessment (2013).

Landscape and visual effects are related but independent issues; landscape effects are changes in the landscape, its character and quality; while visual effects relate to the appearance of these changes and the resulting effects on visual amenity, as experienced by visual receptors.

The development area, which is 29.6 ha in total, covers the majority of the lands covered by the Barnhill Local Area Plan (LAP), February 2019, and will hereafter be referred to as ‘the Development Site’ or ‘the Site’. The Barnhill SHD / Barnhill Garden Village will be referred to as ‘the Proposed Development’.

The LVIA is based upon a desk top assessment of relevant plans, guidance and landscape character assessments, as well as thorough site assessments carried out in May 2019 and May 2022.

The general EIA study area includes the Site to be developed and immediate boundaries / adjacent roads. For the purpose of the LVIA and to provide landscape context, the study area was extended to an area of up to 2 km surrounding the general EIA study area. A larger study area greater than 2 km was not found necessary, due to the visual enclosure of the local area, owing to the flat topography surrounding the Site and abundance of hedgerows in the local landscape to the west, south and east, as well as the urban environment to the north of the Site. It should be noted that the visual envelope, i.e. the area from where the Development Site is actually visible, is much smaller than the study area

As part of the desktop study existing development plans relevant to the Proposed Development, such as the Fingal Development Plan (FDP) 2017-2023, were searched for landscape or visual related designations, policies or objectives. These include Protected Views and Highly Sensitive Areas.

Following the desktop study and the site assessments, the landscape and visual baseline was described, i.e.

- the existing landscape, including landform, land cover, influences of human activity, aesthetic and perceptual aspects (e.g. tranquillity or wildness) and overall character; and
- the existing visual environment, including a description of the area from where the Proposed Development may become visible, the nature of available views (e.g. open, glimpsed, intermittent) and who may experience those views (e.g. residents or road users).

Based on these descriptions, those landscape and visual receptors likely to be affected by the Proposed Development were identified.

Following a description of the aspects of the Proposed Development likely to result in landscape and visual effects, the below step by step approach was applied in making judgements about the level of landscape and visual effects, i.e.

- judgements about the value and susceptibility of the landscape / visual receptors to change are combined into a judgement about sensitivity;
- judgements about the size/scale of the effect, its geographical extent and its duration and reversibility are combined into a judgement about the magnitude of the effect; and finally,
- the judgements about sensitivity of the landscape / visual receptors and the magnitude of the effect are combined to judge the level of the effect. A threshold was then identified to show which effects are significant or not. In the case of the

The levels of landscape and visual effects are described as Major, Moderate, Minor or Negligible or a combination of those, e.g. Moderate / Minor. The nature of effects, i.e. positive, negative or neutral is also stated. For this LVIA it has been assessed that Major or Major/Moderate and negative levels of effect are significant.

Please note that it is accepted best practice to acknowledge that whenever you place built development into green field land it will generate significant landscape and visual effects. This doesn't mean that development is inappropriate, it simply means that built form is being introduced into an area that has few or limited structures and will inevitably result in at least localised, significant, landscape and visual effects.

4.2 Policy Context

The review of relevant development plans has identified a number of Objectives in the FDP 2017-2023, which emphasise the importance of the preservation of existing landscape character types and retention of important features, with particular attention to highly sensitive areas or views or prospects of special amenity value (i.e. Objectives NH33-36). The closest highly sensitive area is located to the immediate south of the Development Site, while the Proposed Development is highly unlikely to become visible in any of the protected views listed in the FDP.

The Development Site is zoned as "RA" Residential Area, the objective of which is to "Provide for new residential communities subject to the provision of the necessary social and physical infrastructure."

The Barnhill LAP sets out a number of Green Infrastructure / Landscape policies which aim for the protection of existing trees and hedgerows or their replacement with equal or greater areas of planting, where they cannot be protected (GI5-7).

The LAP further references appropriate building heights, i.e. "primarily range between 4-6 storeys (or greater subject to high quality design and visual impact) along the rail line and canal and between 2-3

storeys elsewhere on the LAP lands.” Although the “Urban Development and Building Heights: Guidelines for Planning Authorities”, December 2018, also apply to the Barnhill SHD planning application.

There are no nature conservation sites in the vicinity of the Development Site and the only formal recreational facility with some views towards the Site is the Royal Canal Way long distance walking route, which follows the Royal Canal, just east of the Development Site.

4.3 Description of Existing Environment

4.3.1 Landscape Baseline

The Development Site is fully located within the ‘River Valleys and Canal Character Type’, as set out in the Landscape Character Assessment of Fingal, contained in the FDP. This character type is categorised as having high value and high sensitivity to development. It should however be noted that the description of this character type focuses on the Tolka and Liffey valleys, as well as the Royal Canal Corridor. The flat agricultural pastoral landscape of the Site and of the area to its west and south is not consistent with this description.

The Development Site comprises several flat agricultural fields under pasture, bound by dense hedgerows, which are typically lined with mature trees. Eight existing residential properties and one industrially use building complex are located within the Barnhill LAP lands but will not form part of the planning application site. The lands to the east, south and west beyond the Development Site have similar landscape characteristics.

To the north, the Site is bordered by the Dunbooyne-Clonsilla railway line with the emerging urban centre associated with the Hansfield Strategic Development Zone (SDZ) located beyond. There is no hedgerow along the boundary with the railway line and the Hansfield SDZ, parts of which are still under construction, giving the northern end of the Site a slightly degraded appearance.

The Site is located on the settlement edge, and at the interface with rural agricultural land, resulting in a transitional local character. No prominent natural features exist in the local landscape.

The Royal Canal is located east of the Development Site. It is enclosed in character, as it is set at a slightly lower elevation than the surrounding land and is flanked, for the most part, on both sides by tall hedgerows. The Dublin-Maynooth Railway line runs parallel to the canal on its eastern side but is well screened from the canal by the canal-side hedgerows.

The R149 Clonee to Leixlip Regional Road is the main transport route through the study area, passing the western boundary of the Development Site. The R121 Clonsilla to Lucan road passes 300m to the south-east of the Site, east of the Royal Canal and the Dublin-Maynooth railway line. The N3/M3 National Road can be accessed via the R149, just outside Clonee and, within 3km north of the Development Site.

These higher-class roads are connected by a dense network of local roads, including Barberstown Lane North, which crosses the northern half of the Site in a north-west/south-east direction and Barberstown Lane South, which marks the southern boundary of the Site. The two roads meet in the eastern corner of the Site, with a road continuing south-east, crossing over the Royal Canal at Pakenham Bridge and the adjoining railway line, before meeting the R121 a further 200m south-east.

A new road, the Ongar to Barnhill Distributor Road, is permitted and will be constructed prior to any works taking place as part of the Proposed Development. This road will cut through the western half of Site, linking the existing Ongar Distributor Road beside the Hansfield Educate Together National School to the north, with the R149 in the south-western corner of the Site.

Another sign of the manmade influences in the local landscape is a high voltage electricity line, which crosses the north-western corner of the Development Site, with two steel pylons located within the Site.

As mentioned, the Hansfield SDZ is located immediately to the north of the Development Site, with the neighbourhood of Ongar located to the north of Hansfield and the Dublin suburbs of Clonsilla and Blanchardstown to its east. The Kildare town of Leixlip is located 2km to the south-west and the Meath town of Dunbooyne 3km to the north-west. Ribbon development and one-off housing is found frequently along the roads within the agricultural landscape between these urban centres.

The southern section of the Site is generally tranquil with some noise apparent from adjacent roads. This changes along its western boundary with the busy R149 and along its northern boundary, where

the adjoining railway line and Hansfield SDZ present strong urban influences, including increased movement and noise. The lands immediately adjoining the railway line to the north, currently are under construction

4.3.2 Visual Baseline

Views towards the Development Site are fully screened from the vast majority of locations within the study area, beyond the boundaries of the Site. This is due to the flat topography in combination with tree-lined hedgerows present within the local

Except for intermittent locations along the R149 within 1.3km to the south-west there are no views towards the Site from locations within the agricultural landscape to the south and west. To the east, there are no views from any locations east of the Royal Canal, due to the dense vegetation along the canal corridor. To the north, there are no views from locations beyond the first row of buildings within the Hansfield SDZ.

The range of visual receptors present within and surrounding the Development Site includes residential receptors, rail and road users, as well as recreational users of the Royal Canal. Photography and verified view montages from eight representative viewpoints are included in the Photomontages and CGI Booklet at Appendix 4.1 of the EIAR.

4.3.3 Sensitive Receptors

The landscape receptors potentially affected by the Proposed Development and therefore considered as part of the assessment of landscape effects, are:

- the individual landscape elements making up the Development Site, i.e.
 - agricultural fields; and
 - mature hedgerows with associated hedgerow trees;
- the main aesthetic and perceptual aspects associated with the Site, i.e.
 - visually enclosed nature of the Site due to surrounding vegetation, with some occasional distant views towards the Dublin Mountains; and
 - Tranquil / still nature of the southern part of the Site boundary diminishing along western and northern boundary;
- the overall character receptors, i.e.
 - the Agricultural Lowland Character of the Site and the land to the immediate west (similar to County Meath LCA11 – South East Lowlands);
 - the Highly Sensitive Landscape area, to the south and east of the Development Site, including the Royal Canal Corridor (part of the Fingal River Valleys and Canal Character Type); and
 - the Hansfield SDZ.

The visual receptors potentially affected by the Proposed Development and therefore considered as part of the assessment of visual effects, are:

- Residents
 - along Barberstown Lane North (7 properties);
 - along Barberstown Lane South (2 properties);
 - along the R149 along the western boundary of the Development Site (7 properties);
 - along the R149 within 1.3km to the south-west of the Development Site (ca. 10 properties); and
 - along the southern boundary of the Hansfield SDZ (multiple residential units).
- Road users
 - along Barberstown Lane North and including Pakenham Bridge (ca. 900m section of road);
 - along Barberstown Lane South (ca. 1,000m section of road);
 - along the R149 along the western boundary of the Development Site (ca. 800m section of road); and
 - along the R149 within 1.3km to the south-west of the Development Site (ca. 1,500m section of road).
- Recreational users (walkers, cyclists, boaters and anglers) along the Royal Canal;
- Rail users of the Dunboyne-Clonsilla rail line.

4.4 Impact assessment

4.4.1 Aspects of the Development Which Have the Potential to Cause Landscape and Visual Effects

The aim of the proposed architectural and landscape design is to implement the vision set out for the Barnhill SHD in the Barnhill LAP, which is *“to create a place to live that is appealing, distinctive and sustainable, maximising the opportunities provided by the surrounding natural environment for improved amenities and the enhancement of biodiversity.”*

This is achieved by including distinctive placemaking tools, such as the proposed red path and moon gates, by retaining sections of and enhancing the existing natural environment (e.g. the existing stream), by providing easy access pocket parks and play areas, as well as ample native and ornamental planting along the proposed streets and public plazas and within the proposed neighbourhood park.

The design further provides for facilities, such as a creche, medical centre, retail units and office hub, all of which would be easily accessible via the numerous pedestrian and cycle links throughout the Site.

The proposed buildings would be finished in muted tones of red, yellow, grey and beige, including clay brickwork details. A similar palette is present within the Hansfield SDZ, and this is also suitable to the location of the Site at the interface with rural agricultural land, where bright/striking colours would be out of place.

It is proposed to develop the Site in five phases, over a period of eight years, starting with the area to the north of Barberstown Lane North and east of the Ongar to Barnhill Distributor Road, moving south from there, with the westernmost residential areas being developed last.

Existing residential properties at the centre of the Development Site would be integrated into the design. Overshadowing caused by the tall apartment buildings at the village centre, and located to the immediate south of the existing properties would be minimized by limiting the height of such buildings to 3-storeys. This also retains the illusion of potential longer distance views in a southern direction. Further to that, the retention of part of the existing hedgerow along Barberstown Lane North, as well as ample new planting along the property boundaries, will provide some level of screening.

The main aspects of the Proposed Development, which have potential to cause Landscape and Visual effects are:

- the construction works, including site fencing/hoarding, soil stripping, presence of construction machinery, emerging buildings and landscaping works; as well as the associated loss of landscape elements, i.e. nine agricultural fields and some sections of the existing hedgerows and associated trees; and
- the presence of the operational development, comprising 1,243 residential units, made up from 2-storey houses, 3-storey duplex units and 2-12-storey apartment buildings, with the higher density and associated tallest buildings concentrated in the north-eastern section of the Site, towards the Hansfield rail station and with the density / height of buildings reducing towards the southern and western boundary; as well as the presence of the associated people and cars and related noise and movements.

4.4.2 Landscape Effects

The majority of the landscape receptors were assessed as having medium or medium/low sensitivity, mainly due to the absence of landscape designation. The Hansfield SDZ was found to have low sensitivity. Please note that despite its designation as a ‘highly sensitive landscape’ the area to the south of the Site was found to be of medium sensitivity to the Proposed Development, due to its locally pastoral character and as this is a local authority and not a national designation.

While the change to the agricultural fields and the sense of tranquillity within parts of the site would be large, the overall magnitude of change during the construction phase for all landscape receptors was assessed as medium, medium/slight or slight. This is as the changes would be largely limited to the Site, due to the level of enclosure provided by existing vegetation, and the limited duration of the construction phase.

When combining the receptor sensitivity and magnitude of landscape change during the construction phase, the resulting effects for all landscape receptors were assessed as moderate, moderate/minor or minor and mostly negative, but not significant.

During the operational phase the scale of change for some receptors will reduce, as there would be no further changes and/or due to the maturing vegetation within the Site. At the same time the duration of the operational development would be permanent. As a result, the magnitude of change ranges from no change to the agricultural fields landscape receptor to medium and medium/slight for all other receptors.

When combining the receptor sensitivity and magnitude of landscape change during the operational phase, the resulting effects for all landscape receptors were assessed as moderate, moderate/minor or minor and mostly negative, but not significant.

4.4.3 Visual Effects

Apart from the Highly Sensitive Landscape to the South of the Site there are no designations raising the value of existing views. Residential and recreational users are considered to be of high susceptibility to change, while rail and road users are considered to be of low susceptibility, as they do not typically focus their attention on the landscape.

As a result, all road and rail users are assessed as having medium/low or low sensitivity, while most residential and recreational users are assessed as having medium sensitivity. The residents within 1.3km to the south-west of the Site and the recreational users along the Royal Canal are assessed as having high/medium sensitivity.

While the scale of change in most views, during the construction phase, would be medium or large, most visual receptors would experience a medium, medium/slight or slight magnitude of change, due to the small amount of receptors affected or a short-term duration of effect, if the changes will only become visible during a later phase of the construction works. The magnitude of change for the residents along Barberstown Lane North is assessed as substantial/medium, due to their close proximity and enclosure by the construction works.

When combining the receptor sensitivity and magnitude of visual change during the construction phase, the resulting effects for most visual receptors were assessed as moderate, moderate/minor or minor and negative, but not significant. The level of effect for the residents along Barberstown Lane North was assessed as major/moderate negative and locally significant.

During the operational phase the scale of change for the visual receptors and number of visual receptors would largely remain the same, while the duration of the development would be permanent. As a result, the magnitude of change increases slightly for most visual receptors.

When combining the receptor sensitivity and magnitude of visual change during the operational phase, the resulting effects for most visual receptors were assessed as moderate, moderate/minor or minor and negative, but not significant. The level of effect for the residents along Barberstown Lane North and within the Hansfield SDZ was assessed as major/moderate negative and locally significant.

4.4.4 Cumulative Impacts

A number of major schemes located along the southern boundary of the Hansfield SDZ, that either have planning permission or are in the process of being implemented, were considered as part of the assessment of cumulative landscape or visual effects.

The Proposed Development would result in a southward extension of the Hansfield SDZ, containing similar elements of similar design and mimicking the development densities to the north, with the tallest/high density units concentrated towards Hansfield train station and decreasing density and lower building heights to the west and south. Further to that, the decrease of housing densities to the south and west, as well as the large neighbourhood park along some of the southern boundary would result in a softening of the settlement edge towards the adjoining agricultural landscape. This will improve the transition between the urban character area to the north and the agricultural character of the landscape to the south. There will therefore be no significant cumulative landscape effects, between the Proposed Development and the third-party schemes along the southern boundary of the Hansfield SDZ.

In views from locations within the Site and along its western and southern boundaries, there will be little intervisibility between the third-party developments and the Proposed Development, resulting in limited and not significant cumulative visual effects.

In views from locations in the vicinity of the eastern boundary of the Site, including the Royal Canal, the sections of the third-party developments not yet constructed will result in little change to the composition of the existing views. The visual effects, once the Proposed Development is added, will therefore be

very similar to what was assessed, as part of the visual assessment above, which concluded that there will be no significant visual effects in views from this area. There will therefore be no significant cumulative visual effects in views from this area.

In views from locations within 1.3 km to the south-west of the Site, the proposed development will become visible in front of the Hansfield SDZ, effectively blocking views of the third-party developments. There will therefore be no significant cumulative visual effects in views from this area.

In views from locations within the Hansfield SDZ, there will be little intervisibility with the Proposed Development, once all third-party developments are completed, as these will effectively block views towards the Site. Also considering the existing urban environment of this area there will be limited and not significant cumulative effects. The visual effects on views from the apartments and houses and public open spaces along the southern boundary of the Hansfield SDZ were assessed, as part of the visual assessment above.

4.5 Mitigation Measures

The LVIA has identified localised significant visual effects, on views experienced by the residential receptors located along Barberstown Lane North and along the southern boundary of the Hansfield SDZ, both during the construction and the operational phase. These should be the focus of any mitigation measures proposed as part of this Chapter. However, the type of development proposed includes tall apartment buildings in high density areas and where these are visible at close distance or by a large amount of visual receptors it is not always feasible to mitigate the visual effects to levels not considered significant (e.g. through additional planting).

Instead, it is important to ensure that effects on visual amenity are minimised during the construction and operational phases, as far as is feasible. This is achieved through good site management, best practice construction methods and a high-quality design, creating an aesthetically pleasing environment, which respects the character of the local area.

Assuming that the proposed outline Construction & Environmental Management Plan (CEMP), submitted with the planning application, would be implemented in full and that all of the proposed architectural and landscape features would be implemented in full and to a high standard, it is not considered that additional landscape or visual mitigation measures are required.

5 Material Assets: Traffic and Transportation

5.1 Introduction

CSEA has been commissioned to prepare a Traffic and Transport Assessment (TTA) for a proposed mixed-use development at site located in the Barnhill area South of Ongar Village, Clonsilla, Dublin 15.

The contents within this chapter are based on the full Traffic and Transport Assessment carried out in relation to the proposed development and submitted within the Planning Pack as a separate Report. The contents of such have been summarised for the purposes of this EIAR Report.

The Proposed development has been designed to promote Active Travel and sustainable public transport trips in accordance with transport policy and the Climate Action Plan.

- The development is situated directly adjacent to the Hansfield Station which at the moment will have a high frequency/capacity rail service. Following implementation of Dart + west, the services on this station are expected to further improve.
- The walking and cycling network within the development is designed to promote active travel access to Hansfield Train Station, the Village Centre, proposed School site, public park, Royal Canal Greenway and surrounding Cycle and pedestrian routes on Ongar Barnhill Road and within Hansfield. This is achieved by the provision of many pedestrian/cyclist only links throughout the development connecting to a Pedestrianised village centre street (except for Bus) and large pedestrian public plaza connecting to Hansfield Station. It is proposed that Barberstown Lane North will become a main pedestrian and cycle priority artery through the development, with vehicle use restricted to local access only.
- Vehicle traffic circulation at the Village Centre is restricted to promote active travel access to the school site, village centre and station.
- The pedestrian, cycle and road network design has taken account of pre-planning comments by Fingal County Council, National Transport Authority and An Bord Pleanála.

This assessment has been prepared by Carol Diaz-Rosario, *MSc., B.Eng.*, Transportation Engineer with Clifton Scannell Emerson team, on behalf of the Client.

5.2 Assessment Methodology

5.2.1 Baseline Traffic Counts

Due to the COVID-19 pandemic and related restrictions implemented by the Irish Government in December 2020, traffic volumes in the road network surrounding the site have significantly decreased. As a result, the existing flows in the road network do not represent a worst case scenario for traffic conditions in the local area. In light of this, and in order to determine baseline traffic conditions and provide a basis from which the future development's traffic impact can be analysed, 2019 data has been used for the assessment.

The road network was modelled at both the AM and PM peak hour, which have been determined to be 08:00-09:00hrs and 17:00-18hrs, respectively. for a Do-Minimum and Do-Something. The development's impacts were assessed for the Year of Opening (YoO) which has been assumed to be 2025, Future Year 2030 (YO+5) and Horizon development 2040 (YoO+15).

5.2.2 Road Assignment

The Blanchardstown Local Area Model was used as a baseline to assess the development traffic impacts. Traffic survey data, collected in February 2019 was then used to calibrate and validate the 2019 base LAM to ensure that they provide an accurate representation of the worst case scenario for traffic flow within the study area.

The road assignment within the Blanchardstown LAM is undertaken using the SATURN suite of modelling software. It allocates road users to routes between their desired origin and destination taking cognisance of aspects such as capacity constraints and traffic congestion.

5.2.3 Future Road Network Assumptions

The assessment will take into consideration the road schemes planned in the vicinity of the development site. These are:

- **Ongar-Barnhill Road scheme**, which is included in the Barnhill LAP and is to be delivered by FCC as part of their Section 48 programme. This Road link is expected to be put out for Tender in Q3/4 2022 and to be completed by Q2/3 2024. This road is required in order to provide for a coherent sustainable movement and transport strategy and to maximise development capacity within the Barnhill LAP lands.
- **Kellystown Link Road**, this road is not required for the delivery of the proposed development, however it has been included to be able to take into account the traffic generation associated with Kellystown LAP (to establish a worst case scenario for traffic flows in local network). Pre-draft phase was initiated by Fingal County Council in mid-2019, and this road scheme has been presented to elected councillors which is included in the draft Kellystown LAP.

5.2.4 Mode Share

The choice data contained within East Regional Model and the Greater Dublin Area (GDA) Strategy was utilised as a base for developing the LAM, with additional network and zonal detail included to provide an enhanced representation of the road network, and route choice, in the study area. The road network was reviewed to ensure that it provides a robust and accurate representation of existing conditions.

5.2.5 Proposed Development Occupancy Data Assumptions and Trip Generation

The total number of trips that will access/egress the development during the peak hours have been estimated using a combination of the NTA's National Demand Forecasting Model (NDFM) and the East Regional Model (ERM). The following general assumptions have been used for estimating land use occupancy within the Barnhill LAP lands that were used as input in the model:

- Population:
 - 2.0 persons per 2- bed apartments
 - 2.4 persons per 3- beds apartments
 - 2.8 persons for all non-apartment units
- Education: 28 pupils per primary school classroom
- 230 children per 900m² creche
- Employment: 1 employee per 50m² retail or commercial space

The assumptions presented above have been based on the demographic and land-use estimates, including population and levels of employment and education, contained in the NTA's 2040 planning sheet for testing the GDA Strategy, and the Census 2016 data.

5.2.6 Hansfield SDZ Development and Kellystown LAP Lands Population Assumptions

The future traffic generation associated with Hansfield SDZ and Kellystown LAP developments have been taken into account in the traffic modelling, in order to establish a worst-case scenario in the network. The traffic for these developments has been estimated utilising the same methodology presented in preceding section.

5.2.7 Assessment Years and Scenarios

Assessment Years

The following assessment year has been taken into consideration in the analysis:

- 2019: Baseline Year
- 2025: Development's Year of Opening (YoO)
- 2030: Future Year, YoO+5
- 2040: Horizon Year YoO+15, in line with the National Transport Authority 2040 planning sheet and East Regional Model.

Assessment Scenarios

A 'Do-Minimum' scenario and a 'Post Development/Do-Something' scenario have been assessed to understand the proposed development's impact to the local road network. These scenarios can be described as follow:

- Do-Minimum: This scenario will establish the performance of the road network with background traffic conditions and without the proposed development. The Blanchardstown Local Area Model have served as basis for this scenario. This scenario takes into consideration include all future planned road network in the vicinity of the site, all improvements to the public transport infrastructure proposed as part of BusConnect, Dart + West, and the Cycle Network Plan, and the traffic associated with the Hansfield SDZ, and Kellystown LAP lands.
- Post Development or 'Do-Something' Scenario: The with-development or 'do-something' scenario represents traffic conditions following completion of the proposed development, i.e., do-minimum plus additional traffic generated by the proposed development.

5.2.8 Assessment Junctions

Traffic models of critical junctions in the network have been developed to assess the development's impacts to the operation of local road network. The industry standard ARCADY and LinSig traffic modelling software have been used for predicting the capacities, queues, and delays of the following junctions:

- Junction 1 (J1): Barnwell Road/ Ongar Distributor Road/ Littlepace Distributor Road junction, known as the Barnwell roundabout.
- Junction 2 (J2): Ongar Barnhill NS Link Rd/ R149 Barberstown Lane South Junction.
- Junction 3 (J3): Baberstown Lane South/ Barnhill Development South Access A Junction.
- Junction 4 (J4): Baberstown Lane South/ Barnhill Development South Access B Junction.
- Junction 5 (J5): Milestown Road/ Anna Liffey Mills Road/ Woodwall Road Junction

5.3 Existing Conditions

Existing Road Network

The development site is located in close proximity to the following roads:

- R149
- R121
- Barberstown Lane North
- Barberstown Lane South
- Ongar Distribution Road

The existing and proposed provision in these road for all network users has been taken in consideration for the assessment.

5.3.1 Existing Public Transport Services

The Hansfield Train Station is roughly 350 m from the centre of the site. It connects Barnhill to Dublin City Centre and Longford via M3 Parkway. Peak hour frequency in this station is 30 minutes. There are several bus stops towards the north of the site. The nearest bus stop is approximately 1.2 km from the centre of the development to the north of the site, with a peak hour frequency of 10 minutes.

5.3.2 Existing pedestrian and cyclist facilities

There are presently no footpaths and cycle facilities along both sides of roads in the vicinity of the subject site. Ongar Distribution Road, which is located to the north of the development site, has designated bus lanes, cycle lanes and footpath facilities on both the sides of the road all along the stretch.

5.4 Future Receiving Environment

5.4.1 Public Transport

DART + West Programme

The key piece of strategic transport infrastructure to be delivered in future adjacent to the development site is the DART + West Programme. This project aims *“to deliver frequent, modern, electrified services within the Greater Dublin Area, helping to achieve government climate change targets by reducing greenhouse gas emissions and facilitating a societal shift away from private car use and on to public transport. It will facilitate sustainable mobility and development, promote multi-modal transit, active transport and boost regional connectivity, helping make public transport the preferred option for more and more people.”*

The DART + West will be the first infrastructural projects of the DART+ Programme to be delivered, improving capacity on Maynooth and M3 Parkway to city centre rail corridors. The development site will benefit from the improvements of this programme as it is directly adjacent to the Hansfield Train station (on the M3 Parkway Line).

The project will bring the following improvements to the Line:

- Increase train capacity from the current 6 trains per hour per direction up to 12 trains per hour per direction subject to demand. Passenger capacity will increase from 5,000 in 2019 to 13,200 passengers in 2025.
- Electrification and re-signalling of the Maynooth and M3 Parkway lines (approximately 40km in length). Reduce carbon emissions through the deployment of new electric trains.
- Support growing communities, businesses, and future development by providing high-quality integrated public transport service in line with Government policy including the National Planning Framework and Climate Action Plan.
- Closure of level crossings and provision of replacement bridges where required, including the level crossings at Closnilla and Barberstown.

Bus Connects

The development site is located in close proximity to branches B1 and B2 of the proposed BusConnects B-Spine. These branches will be serviced every 8 minutes throughout the day, with a 15-minute bus frequency. These services will connect the site with Blanchardstown Town Centre, Dublin City Centre and several areas within north and south-west Dublin.

In addition to the B-Spine branches discussed above, the proposed development will be service by Local Routes L52, connecting to Adamstown Station, and Peak Time routes X61/X62, connecting to the city centre.

Cycle/ Walking Network

The development site is located in close proximity to the following Cycle Routes:

- Royal Canal Greenway: from the city centre via Cabra, Ashtown, Castleknock, Coolmine and Clonsilla. Some or all of this greenway will form part of National Cycle Route 2 between Dublin and Galway
- Liffey Valley Greenway: along the southern edge of this sector between Chapelizod and Leixlip.
- Route 5 Primary and Secondary: Liffey Quays to Heuston Station, and then through the Phoenix Park to Castleknock and Blanchardstown.
- Route NO5: from the coast at Kilbarrack to Donaghmede, Coolock, Santry and Finglas

At present, there are existing cycleways within the Hansfield SDZ that link from Hansfield Train Station to secondary routes north and east of the SDZ.

5.5 Proposed Development Movement Strategy

5.5.1 Internal Pedestrian/Cyclist Network and Circulation

The network accommodating pedestrians and cyclists extends through the entire development, along all road and parks. Footpaths have been designed to have a minimum width of 2.0 metres. The cycle tracks proposed will be 1.75 metres wide. The areas where pedestrians and cyclists will be accommodated within a shared spaces will measure 3-4 metres wide. Two pedestrian/cycle link will be provided across the Ongar-Barnhill Road, one connecting 'Parkside' Character Area to the 'Barnhill Stream' and the second connecting 'Link Road West' to 'Link Road East'.

Mid-block crossings have been provided where the distance between junctions is greater than 120m.

5.5.2 Pedestrian/Cyclists Connection to Hansfield and Royal Canal Greenway

A Pedestrian/Cyclists link between the Barnhill Site and Hansfield area will be available via the proposed Ongar-Barnhill Link Road and through a link across the Hansfield Train Station. The proposal also will have a direct connection to the Royal Canal Greenway.

5.5.3 Internal Vehicular Circulation

Vehicular access to the development site will be via 2 no. access points into Barberstown Lane South. Roundabouts will be available at this access points, which will be delivered by Fingal County Council with the upgrades proposed on this stretch of road.

The proposed Primary Link will have a carriageway of 6.0 metres wide and the proposed secondary roads will have a carriageway of 5.5 metres.

5.5.4 Proposed Barberstown Lane North Layout

For most sections of Barberstown Lane North, it is proposed that vehicle movements will not be allowed as this will be turned into a pedestrian/cyclist's link. The only section of road that will retain vehicle movements will be the access to existing properties within the site.

The pedestrianisation of Barberstown Lane North (east of the existing properties) will be implemented at a later phase in the development, subject to agreement on implementation with Fingal County Council.

The creation of a cul-de-sac will be required on the western end of the road for the delivery of the Ongar-Barnhill Road by Fingal County Council; Bollards will be put in place where this road meets Barberstown Lane South and Milestown Road to restrict vehicle movement (eastern end).

The drawings illustrating the existing and proposed cross-sections for this road have been included in the CSEA drawing pack.

5.5.5 Access to Existing Houses Within the Site

The stretch of road currently providing access to the existing properties inside the site will remain as existing. 'Access Only' signage will be put in place in order to limit the number of vehicle movements in and out the retained section of road. Bollards will be put in place on the approach eastern side of this access road in order to ensure vehicular movements restrictions into the plaza leading to the train station.

5.6 School/Creche Access

It is proposed that the road directly to the north of the school will be a One-Way(westbound). General vehicle movement will be restricted, allowing access only for disabled parking users attempting to reach the disabled parking spaces on this road, vehicles to use the loading bay, and buses. This will ensure a safe school street access environment free from traffic and will encourage active travel school access.

The car park to the east of the future school will provide park-and-stride for the school/creche. It is anticipated that this car park will accommodate the car parking demand for the school and the public park.

Designated creche car parking is provided within the basement car park of Station Plaza character area, where the creche is located.

5.7 Proposed Car Parking and Cycle Parking Strategy

5.7.1 Car Parking

A total of 1,593 car parking spaces are proposed for the development. Appropriate Parking numbers have been provided given the location of the scheme adjacent to the Rail station and to promote Active travel.

5.7.2 Cycle Parking

A total of 3,315 cycle parking spaces are proposed for the development. Cycle parking provision for the apartments/duplex element of the proposed development has been designed in accordance with the standards presented within the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, December 2020*.

5.7.3 Hansfield Station Commuter Cycle Parking

A total of 82 no. cycle parking spaces, of which 8 are for cargo bikes, are proposed directly adjacent to Hansfield Train Station. These spaces are anticipated to accommodate the cycle parking demand associate with commuter.

Please refer to the Landscape strategy for further details about the facilities provided near the station, including parking, storage lockers, bike pump, etc. This document also presents the provision of a pole to indicate train times near Market Square (civic space).

5.8 Shared Driving Scheme (Go-Car)

A total of 2 no. Go-Car Car Parking Spaces will be provided in the Village Centre. These spaces will be located in the car park adjacent to the school and will be dedicated for the use of this share driving scheme.

The provision for Go-Car can be increased in the future based on demand.

5.9 Amenities in Local Area

The proposed development will include the space for the provision of Retail, Commercial, Creche, Medical, and education facilities. These facilities will be primarily located within the Village Centre Area, the creche is to be located in Station Plaza with direct pedestrian access to the Village Centre.

The proposed development site will also benefit from the amenities, such as restaurants, supermarket, pharmacies, and medical facilities, available within the Hansfield/ Ongar area and the Hansfield Village, which is partially developed and under construction.

5.10 Predicted Impacts of The Development

5.10.1 Construction Stage Impact

The potential impacts resulting from construction works for the proposed development are outlined in Table below. It should be noted that these impacts would be **short-term, negative, and not significant**, and are not expected to result in significant residual impact.

Table 5.1 Potential Impacts during Construction Stage.

Activities	Potential Impact	Significance of Effects	Duration of Effects
Transportation of site machinery and materials	Noise/disturbance to other properties in the area. Dust raised by construction traffic. Dirt and mud dragged onto the road by construction traffic.	Moderate	Temporary

Given the short-term nature of the peak construction phase, the overall impact of the construction phase involving the development is not estimated to be significant and shall not affect the performance of the junctions under study. Further details of the impacts associated with the proposed development at construction stage can be found in the Outline Construction and Environmental Management Plan (CEMP) submitted with the Planning Pack.

5.10.2 Operational Impacts

The traffic modelling undertaken demonstrated that the junction under study will continue to operate successfully with the proposed development in place.

Based on the modelling results obtained for all junctions, it can be concluded that the local road network will operate within capacity and at satisfactory levels during peak hours for all assessment years with the proposed development in place. Therefore, the potential traffic impact associated with the development was found to be **long-term, neutral, and imperceptible**.

The proposal has been designed to be a walking/cycling friendly scheme, very well served by public transport and with plenty of amenities available at a short walk distance. A Mobility Strategy has been created for the development, submitted as a separate document, to promote active travel and to minimising the potential car trips in the local area.

5.10.3 Cumulative Impacts

The assessment undertaken has taken in consideration the traffic associated with all major schemes to be delivered in the vicinity of the site. This also has taken into account all road network and public transport modifications in the local area. All junctions will continue to operate successfully with all these schemes and the proposed development in place.

Therefore, the potential cumulative traffic impact associated with the development was found to be **long-term, neutral, and imperceptible**.

5.11 Mitigation Measures

During the construction phase of the development, the following measures will be put in place to reduce the impact on the surrounding environment:

- The contractor will be required to provide wheel cleaning facilities, and regular cleaning site access will be carried out.
- Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads.
- Monitoring and control of construction traffic will be ongoing during construction works.
- Construction traffic routes shall be used strategically by construction vehicles to minimise traffic impact to surrounding properties.

Further details of the mitigation measures to be put in place at construction stage can be found in the Outline CEMP submitted with the Planning Pack.

6 Material Assets, Service Infrastructure and Utilities

6.1 Introduction

Chapter 6 of the EIAR document will assess the potentially significant effects of the Proposed Development upon the Material Assets, both existing and proposed, serving the subject lands and surrounding area. "Material Assets" are the physical resources serving a subject site or area that are of human origin, i.e., existing, and proposed utilities and service infrastructure. The material assets for the proposed development site that are evaluated in this chapter are surface water drainage, foul sewerage, water supply, gas supply, electrical supply, public lighting, and telecommunications / broadband. This chapter will also assess the proposed development in terms of construction and operational waste management.

6.2 Assessment Methodology

A desktop survey was carried out to determine the material assets (services infrastructure) associated with the site of the proposed development. Existing services information was gathered from each respective service provider (i.e., ESB, Gas Network Ireland, Eir etc.). The existing built services information has been checked for accuracy during numerous visits to the site.

Predictions of resource usage was undertaken for both the construction and operational stages of the development, and the impacts of these stages on existing and proposed material assets were assessed. Mitigation measures are proposed, where appropriate to limit negative impacts arising from the proposed development.

6.3 Existing Environment Material Assets

Listed below is a summary of the existing environment material assets associated with the Barnhill SHD site:

- **Existing Surface Water Drainage** - There are currently no public surface water drainage networks located within, or immediately adjacent to, the site area designated for the Barnhill SHD. The existing lands are currently used for farming purposes and are drained by a series of existing ditches. These existing ditches discharge to the existing Barnhill Stream watercourse that traverses through the southern part of the site.
- **Existing Foul / Wastewater Sewer Drainage** - There are currently no public foul / wastewater sewer drainage networks located within, or immediately adjacent to, the site area designated for the Barnhill SHD. The existing dwellings within the development site each have their own individual sewerage tanks and wastewater treatment systems.
- **Existing Watermain Supply** – An existing 4-inch Ø uPVC watermain, installed in 1965, is present along the length of the Barberstown Lane North Road and supplies the existing dwellings along this road. There are 2 no. watermains located within the R149 regional road that runs along the western boundary of the site; an existing 4-inch Ø uPVC watermain, installed in 1965, and a 200mm Ø uPVC watermain, installed in 2004.
- **Existing ESB Power Supply Network** - there is no existing underground ESB duct infrastructure located within, or beside, the development site. An existing 110kV High Voltage (HV) overhead power line passes over the northwest corner of the site with 2 no. associated pylons located within this area of the site. An existing 10-20 kV overhead power line also crosses through the northern part of the site and supplies ESB power to the existing dwellings located along the Barberstown Lane North Road.
- **Existing Gas Supply Network** – There are no existing gas mains located within or near to the Barnhill SHD site.
- **Existing Eir Network** – There are overhead Eir telecoms lines located along the northern side of the existing Barberstown Lane North Road. There is no existing underground Eir duct infrastructure located within the Barnhill SHD site area. Adjacent to the site, Eir ducts are present within the T50 fibre infrastructure network.
- **Other Existing Telecoms** - There are some other fibre broadband / telecommunications service providers with ducts within the T50 fibre infrastructure network. The T50 ducts run along the existing R149 Clonee to Leixlip Road to the West of the Barnhill SHD site and along the existing R121 Barberstown Lane South Road to the south of the development site. Virgin Media, Vodafone and Aurora Fibre Telecoms ducting are among those who have fibre telecoms infrastructure within the existing T50 network.
- **Existing Public Lighting** – There is no Public Lighting infrastructure located within the Barnhill SHD development site.

6.4 Description of Future Receiving Environment

The future Ongar-Barnhill Distributor Road (to be delivered by Fingal County Council) is to be constructed to provide access to the Barnhill SHD. The main section of this future road shall connect to the existing Ongar Distributor Road roundabout located to the north of the Barnhill SHD site. From here, the proposed road shall run in a southerly direction across the existing Clonsilla – M3 Parkway Railway Line by means of a new railway overbridge and connect to Barberstown Lane South and the existing R149 regional road by means of a new signalised junction. This scheme will also include the realigned upgrade of the Barberstown Lane South Road, complete with the 2 no. roundabouts which will provide access to the Barnhill SHD lands. The Ongar to Barnhill Distributor Road Scheme shall be constructed prior to the commencement of construction works for the proposed development and, therefore, shall be considered part of the future receiving environment of the Barnhill SHD.

The following material assets are to be constructed as part of the Ongar to Barnhill Distributor Road and shall be present at the start of the construction of the proposed Barnhill SHD:

- **Future Receiving Environment Surface Water Drainage** - A storm water drainage network shall be constructed as part of the future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road. The surface water network for the future road shall have 3 no. detention basins to provide adequate attenuation storage for the rainfall runoff from the Ongar to Barnhill Distributor Road. These detention basins have been sized so that they can also store some of the surface water runoff generated by the Barnhill SHD.
- **Future Receiving Environment Foul / Wastewater Sewer Drainage** – In order to have sufficient capacity in their existing foul network to cater for the Barnhill SHD, Irish Water require the upgrade of approximately 900m of an existing section of 375mm Ø foul sewer to be increased to 700mm Ø foul sewer. This upgrade shall be completed prior to the start of construction of the Barnhill SHD development.
- **Future Receiving Environment Water Supply and Distribution** - A 300mm Ø watermain is proposed to be installed along the length of the proposed future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road. This watermain will service the Barnhill SHD site.
- **Future Receiving Environment ESB Power Supply Network** - ESB duct infrastructure is proposed to be installed along the length of the proposed future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road which will have spurs that will connect to the Barnhill SHD lands.
- **Future Receiving Environment Gas Supply Network** - It is proposed to install a 180mm Ø gas main along the length of the proposed future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road.
- **Future Receiving Environment Telecoms Network** – Eir and Virgin Media Telecoms duct infrastructure is proposed to be installed along the length of the proposed future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road which will have spurs that will connect to the Barnhill SHD lands.
- **Future Receiving Environment Public Lighting** - Public Lighting and its associated ducting and power supplies shall be constructed as part of the proposed future Ongar – Barnhill Distributor Road and realigned Barberstown Lane South Road.

6.5 Proposed Development

The Barnhill SHD is proposed to have the following proposed material assets / service infrastructure:

- **Proposed Surface Water Drainage Network and SuDS Strategy** - An internal surface water pipe network shall be constructed to carry surface water runoff generated by the development to the Barnhill Stream that runs through the south of the site. Typical pipe sizes of the surface water network shall be 225 – 900mm in diameter. This surface water network will be constructed so that surface water runoff is collected from the Sustainable Urban Drainage Strategy (SuDS) source control features of the development and carried to the main SuDS features of the development, from where it will be discharged, at a controlled flow rate, to the existing stream. The proposed SuDS features for the site shall also treat the water running off the site and remove pollutants.
- **Proposed Foul Sewer Network**: An internal foul sewer network is proposed to be constructed as part of the Barnhill SHD. Typical pipe sizes of the foul sewer network shall be 225–450mm Ø. The foul sewer will discharge to a proposed pumping station located within the south-east of the site, from where it will be pumped to an existing foul sewer network located within the Hansfield development, located to the north of the site.
- **Proposed Water Supply Network**: An internal water supply network is proposed to be constructed as part of the Barnhill SHD. Watermain pipes are proposed to range in size from 110 - 225mm Ø.
- **Proposed ESB Power Supply Network**: An internal ESB power supply duct network is to be constructed as part of the Barnhill SHD.
- **Proposed Telecoms Network**: An internal Eir and Virgin Media duct network is to be constructed as part of the Barnhill SHD to deliver high speed fiber services across the development site.
- **Proposed Public Lighting Network** - Public Lighting is to be installed as part of the development along the internal roads network and within the public plaza and parkland areas of the development.

6.6 Potential Impacts and Mitigation Measures – Construction Stage

Potential Impacts during the construction stage of the Barnhill SHD and mitigation measures proposed to limit negative impacts / ensure positive impacts are shown in the table below:

Table 6.1 Potential Impacts and Mitigation Measures – Construction Stage

Potential Impacts during the Barnhill SHD Construction Stage	Mitigation Measures to be implemented to limit negative impacts / ensure positive impacts
Unrestricted surface water runoff from site and contamination of existing watercourses (moderate, short term negative impact)	Contractor will be required to put temporary measures in place to control rate of surface water runoff to existing watercourses. Appropriate environmental controls to be put in place to prevent pollution of existing watercourses by construction activities.
Wastewater effluent and sanitary waste generated by construction personnel (slight, short term negative impact)	Provision of adequate temporary welfare facilities i.e., toilets and cleaning facilities, within the construction compounds. Foul effluent to be disposed of off-site to an appropriately licensed facility until a connection to the public internal development foul sewer network has been established.
Increase in water demand due to construction activities. Potential damage to existing watermain infrastructure (slight, short term negative impact)	Existing watermains are to be fully protected during the construction of the Barnhill SHD. Irish Water shall be notified in advance of works on, or near to existing watermains.
Diversion of existing ESB power supply overhead wires not being properly planned which results in temporary disruption to power supply to existing properties within the development site area (slight, short term negative impact)	ESB Networks shall be contacted to fully establish the extent of overhead ESB power lines required to be diverted. Diversion works shall be fully planned in advance to reduce impacts to power supply to all existing dwellings.

6.7 Potential Impacts and Mitigation Measures – Operational Stage

Potential Impacts during the operational stage of the Barnhill SHD and mitigation measures proposed to limit negative impacts / ensure positive impacts are shown in the table below:

Table 6.2 Potential Impacts and Mitigation Measures – Operational Stage

Potential Impacts during the Barnhill SHD Operational Stage	Mitigation Measures to be implemented to limit negative impacts / ensure positive impacts
Provision of an improved surface water network with enhanced control of flow and quality of discharged rainwater runoff to Barnhill Stream (slight to moderate, long-term positive impacts)	A suitable SuDS network system shall be in place during the operational stage of the development to ensure that all surface water runoff generated by the development is appropriately stored, and treated, during heavy rainfall events. Treated runoff shall be subsequently discharged to the existing watercourses at a controlled rate. SuDS systems shall be regularly maintained to ensure they are in proper working order.
Increased capacity in existing foul sewer network on Ongar Road. The provision of a modern high quality foul sewer network will allow for connection of the existing dwellings to a public foul sewer network (slight to moderate, long-term positive impact)	The proposed development internal foul sewer network and its associated foul pumping station and rising main shall be constructed in line with Irish Water's Code of Practice and Standard Details which will ensure delivery of a modern, high quality, foul sewer network. The upgrade of the existing foul sewer on Ongar Road, to be completed prior to the commencement of the Barnhill SHD shall increase the capacity of the existing foul sewer network.
The provision of a modern high quality water supply network will allow for removal / upgrade of older existing watermain networks serving the existing dwellings (slight to moderate, long-term positive impact)	The proposed development internal water supply network shall be constructed in line with Irish Water's Code of Practice and Standard Details which will ensure delivery of a modern, high quality, water supply network.
Provision of enhanced telecoms / fibre broadband services to which the existing dwellings may connect (moderate, long-term positive impact)	The provision of Virgin Media and Eir networks shall improve telecoms and broadband for the entire site area. It shall be ensured that the proposed development will not in any way affect the existing TV infrastructure of the adjacent dwellings.

6.8 Monitoring – Construction Stage

Visual monitoring of existing services shall be carried out at regular intervals during the construction stage of the Barnhill SHD. Frequent liaison with all service providers shall also be undertaken and any service provider shall be notified in a timely fashion should construction works be carried out on or adjacent to existing service infrastructure.

6.9 Monitoring – Operational Stage

All utilities will be monitored and metered in accordance with the service agreements made with each utility provider.

Flow monitoring and water sampling of the surface water runoff entering the Barnhill Stream shall be undertaken to measure how effective the SuDS measures for the development are. All Surface water and SuDS features will be visually inspected and regularly maintained.

7 Land

7.1 Introduction

The objective of this chapter is to identify and evaluate the likely significant effects on the land, soils and geology arising from the Proposed Development. The assessment identifies the residual effects arising from the finalised design considering mitigation measures.

7.2 Methodology

Information relating to regional, local and site conditions was assessed using publicly available datasets and review of geotechnical site investigation (soil investigation) carried out at the Proposed Development site.

7.3 Potential Impacts

The potential construction and operational phase impacts to the land, soils and geology from the Proposed Development were assessed. Potential impacts identified from the construction phase included impacts to soil quality from accidental spills and leaks, use of concrete and lime, and excavation and infilling; the use of natural resources; and the loss of agricultural land. The potential operational phase impacts identified included direct discharge to ground, accidental spills and leaks, and changes to water percolation rates to ground. None of the identified potential impacts were found to be significant.

7.4 Mitigation Measures

A number of mitigation measures have been set out, under the following categories:

- fuel and chemical handling, transport and storage
- control of concrete and lime
- control of soil excavation and fill placement works
- sources of fill and aggregates

An outline Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Development, which includes a number of mitigation measures with regards to Land and Soils. This will be used as the basis for a CEMP to be prepared by the contractor for the Proposed Development.

7.5 Residual Impacts

Taking account of mitigation measures proposed the potential impact is considered to be a low impact to a medium sensitivity environment and the significance of the effects has been assessed as slight. Cumulative impacts were not considered to be significant.

8 Water

8.1 Introduction

The objective of this chapter is to identify and evaluate the likely significant effects on hydrology (surface waters) arising from the Proposed Development. The assessment identifies the residual effects arising from the finalised design considering mitigation measures.

8.2 Methodology

Information relating to local surface waters was assessed using publicly available datasets and review of drainage strategy and flood risk assessment report for the Proposed Development.

8.3 Potential Impacts

The potential impacts to the water environment from the Proposed Development were assessed. Potential impacts identified included impacts to water quality from accidental spills and leaks, use of concrete and lime, and from sediments mobilised during construction; flood risks arising from construction works and operational run-off; and leaks from pipes and development use during the operational phase. None of the identified potential impacts were found to be significant.

8.4 Mitigation Measures

A number of mitigation measures have been set out, which include considerations of the following:

- appropriate surface water management during construction
- fuel and chemical handling, transport and storage
- control of concrete and lime
- appropriate drainage systems

An outline Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Development, which includes a number of mitigation measures with regards to the water environment. This will be used as the basis for a CEMP to be prepared by the contractor for the Proposed Development.

8.5 Residual Impacts

Taking account of mitigation measures proposed during the construction and the inherent environmental design considerations during the operation of the Proposed Development, the residual impact for the construction and operational phase is considered to be a low impact to a medium sensitivity environment and the significance of the impact has been assessed as slight. Cumulative impacts were not considered to be significant.

9 Biodiversity

9.1 Introduction

A number of field surveys as well as desk study, with reference to previous surveys by third parties, were carried out to inform the assessment of ecological impacts. A summary of the surveys, results, impacts and mitigation is given below.

9.2 Methodology

The desk study aspect included reference to species data and designated site information held by the Environmental Protection Agency, National Parks and Wildlife Service (NPWS) and the National Biodiversity Data Centre (NBDC). Additionally, reports concerning ecological surveys at Barnhill carried out in 2017 were reviewed and relevant information incorporated into the assessment.

The field surveys comprised habitat and flora survey (including search for invasive non-native plants), bat roost suitability assessment, bat emergence/re-entry survey of relevant features, bat activity survey (walked transect and static detector monitoring), otter *Lutra lutra* survey and badger *Meles meles* survey. Bird survey had been carried out in 2017 and was not repeated because there was unlikely to

have been significant change to the bird population given no significant change to habitats (largely heavily-grazed pasture with hedges/tree lines), lack of rare species or suitability for them, and a conclusion of no likely significant effect on qualifying birds of European sites in the separate Natura Impact Statement (NIS). Amphibian survey was not carried out owing primarily to a lack of ponds, unfavourable nature of the Barnhill Stream and Royal Canal for amphibians (owing to presence of predatory fish and/or flowing water), limited suitability of the small ditches (most of which will be retained) and dominance of heavily-grazed pasture which is not suitable terrestrial habitat for amphibians. Desk study information was sufficient with regard to fish and invertebrates, and considering the limited ecological value of the very small Barnhill Stream.

The assessment of impacts was based on EPA and Chartered Institute of Ecology and Environmental Management (CIEEM) guidance.

9.3 Baseline environment

The desk study identified two proposed Natural Heritage Areas (pNHAs) nearby, and several distant European sites including downstream sites at Dublin Bay.

Habitats at the Proposed Development were found to largely comprised heavily-grazed agriculturally-improved pasture with hedges/tree lines along field lines, in places with small adjacent ditches. A small amount of neutral grassland, marginally more diverse than the agricultural grassland, was also found in the south of the Proposed Development area, and a very small watercourse (the Barnhill Stream) passes through this area. Other vegetated habitats within the Proposed Development area were small and of no note, including small amounts of scrub and a patch of immature weedy woodland at the remnants of a former building. In the surrounding 200 m buffer, dry meadow was found in strips along the canal, and small areas of neutral grassland plantation woodland, however agricultural habitat was again dominant.

The bat roost suitability survey found two trees with Moderate suitability and one building with Low suitability, however no evidence of current bat roosts was found during emergence/re-entry surveys. Several other trees with Low suitability were also found (these require no further survey under Bat Conservation Trust guidance). The static detector recordings were overwhelmingly dominated by three common species (common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and Leisler's bat *Nyctalus leisleri*), with small numbers of recordings of Myotis species (up to 3% of recorded calls but mostly less; those identifiable to species were mainly Daubenton's bat *Myotis daubentonii* and whiskered bat *Myotis mystacinus*, with one call only thought to be of Natterer's bat *Myotis nattereri*) and a very few recordings of brown long-eared bat *Plecotus auritus* and Nathusius' pipistrelle *Pipistrellus nathusii*. The walked transects found small to moderate activity common/soprano pipistrelles and Leisler's bat, predominantly along or near hedges.

Regarding terrestrial mammals, the otter survey did not find any evidence of otter. However, the 2017 surveys had found footprints and spraint outside the Proposed Development area where the Barnhill Stream passes under the canal, and it is assumed that otter would occasionally pass along the stream. The badger survey found one single-hole sett in a hedge, and footprints/trail; no other signs of badger were found. There were desk study records in the general area of pygmy shrew *Sorex minutus*, Irish stoat *Mustela erminea hibernica* and hedgehog *Erinaceus europaeus*, and potential for these exists in the Proposed Development area, mainly along hedges.

Breeding birds in the Proposed Development area were generally common species in small quantity. The most notable species was yellowhammer *Emberiza citrinella* with two probable territories extending into the southern part of the Proposed Development area. The nature of the Proposed Development area, combined with desk study data, indicate that it is not important for wintering birds, and specially-protected birds are highly unlikely to occur with the possible exception of barn owl.

The surveys found that potential for amphibians in the Proposed Development area was limited, with no ponds within 250 m. The Barnhill Stream is primarily flowing water with a likely presence of predatory stickleback (desk study data indicates downstream presence), constituting unfavourable habitat for amphibians. The Royal Canal (outside by near the Proposed Development) is known to be populated with large predatory fish which renders it unfavourable for amphibians. Drainage ditches are small and often shallow, and the heavily-grazed grassland that dominates the Proposed Development area is not suitable terrestrial habitat; moreover, most of the ditches will be retained. Six smooth newts were previously reported outside the Proposed Development area to the north of the railway, however these were subsequently not refound.

Regarding fish, as noted above the Barnhill Stream is very small and would not support a significant fish population, although stickleback are likely to be present given downstream records.

Desk study records of invertebrates found one notable species that could utilise mud in the Barnhill Stream – lake orb mussel *Musculium lacustre*. Other desk study records of notable invertebrates involved species that could not occur in the Proposed Development owing to lack of suitable habitat. Notable desk study records of plants also involved species for which there is no suitable habitat in the Proposed Development area, and no notable plants were found during the habitat survey.

No invasive non-native plants were found in the Proposed Development area. Records of the invasive mammals grey squirrel *Sciurus carolinensis*, brown rat *Rattus norvegicus* and sika deer *Cervus nippon* exist in the general area, but there is no realistic mechanism by which these would be spread by the Proposed Development.

At the time of construction, it was noted that the baseline environment will be different insofar that the upgrade of Barberstown Lane South, and upgraded R149 through the western part of the Proposed Development, will have been constructed.

9.4 Potential impacts and mitigation

Several important aspects of the design of the Proposed Development work to address or much reduce adverse effects on biodiversity, including a suite of sustainable drainage measures to prevent pollution during use of the completed Development, retention of long lengths of existing hedges/tree-lines, retention of the existing Barnhill Stream, and habitat creation near the Barnhill Stream including a wetland feature, planted native woodland and sown native meadow.

In part due to the limited ecological interest of the existing Site, and in view of the above in-built positive aspects of the Proposed Development, numerous possible impacts on ecological features are concluded to be imperceptible or insignificant, or to have no effect at all, without any mitigation. Supported by the separate Natura Impact Statement, this includes a conclusion of no significant effects on European sites.

A very unlikely but potentially significant effect was predicted for otter through construction mortality, which will be mitigated by various measures including pre-commencement survey, pollution prevention and standard best practice during construction (such as provision of means of escape from excavations and general avoidance of construction work at night). Moderate impacts on the Royal Canal pNHA and Liffey Valley pNHA were considered possible from water- or airborne pollution during construction, however standard pollution controls embedded in a Construction Environment Management Plan can reliably be expected to avoid such impacts. Possible mortality of barn owl was predicted if disused buildings became occupied by barn owl prior to demolition, however this will be avoided through pre-commencement survey and follow-on mitigation if found necessary, under ecologist direction.

Slight effects were considered possible during construction for the Barnhill Stream (by pollution), loss of several trees and one building with Low bat roost suitability, and mortality of badger, amphibians and reptiles. However, construction pollution controls will address pollution effects on the Barnhill Stream, and a combination of measures address these species concerns such as provision of bat boxes, pre-commencement survey, and precautionary measures during construction under ecologist supervision as necessary.

For loss of badger foraging/commuting habitat (which includes pasture), and possible bird predation by cats associated with the completed Proposed Development, slight adverse effects are predicted to remain. However, there are several positive effects on biodiversity from the Proposed Development. These include or arise from a significant enhancement to habitat diversity – the existing habitat is largely heavily-grazed pasture, with hedges/treelines and the Barnhill Stream, whereas the Proposed Development, which retains and enhances the Barnhill Stream and retains significant lengths of existing hedgerow/treeline, includes creation of a proposed wetland, native woodland planting and native sown meadow along and near the Barnhill Stream. This has associated species benefits including provision of habitat at the wetland suitable for amphibians, invertebrates, aquatic flora and foraging bats (since it will be largely unlit), and a likely improvement in breeding bird diversity (with the wetland likely to support species currently absent from the area, such as reed bunting). As such, the overall effect on biodiversity is considered to be slightly beneficial.

10 Noise and Vibration

10.1 Construction Phase – Noise and Vibration

- i. The methodology outlined in BS5228:2009+A1:2014 has been used in the construction noise and vibration assessment.
- ii. The significance of the effect of construction noise on existing local receptors is considered to be Negligible.
- iii. It is anticipated that with good site management and communication with residents, the significance of the effect of construction vibration on existing local receptors is considered to be at worst case Minor.
- iv. It is anticipated that short term noise and vibration monitoring may be completed on a minimum of four occasions to coincide with the beginning of each phase of construction. If the limit is exceeded, SLR would recommend that further provision is made for additional monitoring.

10.2 Operational Phase – External

- i. The methodology outlined in BS 4142:2014+A1:2019, BS8233:2014 and CRTN has been used in the operational phase assessment
- ii. With the installation of 1.8m high solid wooden fences at the boundary of plots where the impact is Moderate and/or High the Impact is reduced to Minor, and the resultant Effect would be Not Significant.

10.3 Operational Phase – Internal

- i. The methodology outlined in BS 4142:2014+A1:2019, BS8233:2014 and CRTN has been used in the operational phase assessment.
- ii. With the required glazing specification installed and windows closed the Impact and Effect would be Negligible.

10.4 Cumulative Impacts

- i. The model of the proposals includes traffic of the new road network. The assessment therefore includes cumulative development that are included in the traffic flows. As such, the cumulative impact is seen as Negligible.

11 Air Quality

11.1 Introduction

SLR Consulting Ltd has been commissioned to undertake an Air Quality Assessment as part of the Environmental Impact Assessment Report (EIAR). The assessment presented in Chapter 11 describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing in the area. It then presents the potential impacts of the development and an evaluation of the significance of the effects.

11.1.1 Scope of the Assessment

The scope of the assessment considers:

- construction phase impacts – identification and assessment of potential impacts associated with the construction phase of the proposed scheme, primarily dust amenity impacts and suspended particulate matter with a diameter of less than 10 micrometres (PM₁₀);
- occupational phase – screening and assessment of potential impacts from road traffic emissions as a result of additional trips associated with the development once fully occupied; and
- the requirement for and identification of appropriate mitigation measures.

11.2 Assessment Methodology

11.2.1 Baseline Evaluation

The baseline evaluation is undertaken by:

- review of FCC’s air quality reports;
- review of the Environmental Protection Agency (EPA) ‘Air Quality in Ireland’ reports; and
- reference to the air quality monitoring data available in the public domain through the EPA website.

11.2.2 Construction Phase Impact Assessment

The potential risk of dust impacts during the construction phase of the development have been considered using the approach defined in ‘*Guidance on the Assessment of Dust from Demolition and Construction*’. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- demolition;
- earthworks;
- construction; and
- track-out.

11.2.3 Operational Phase Impact Assessment

Following NRA ‘*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*’, a traffic emissions screening assessment has been undertaken following the DMRB guidance (specifically Volume 11, Section 3, Part 1, HA 207/07).

The NRA guidelines provide a matrix against which to assess the impact and assign descriptors for the significance of the effect. These are presented in Chapter 11 Table 11.2 and Table 11.3.

11.3 Baseline Air Quality

The EPA manages the national ambient air quality monitoring network. The closest air quality monitoring stations to the Site are the Blanchardstown Station situated approximately 4.5km east (which monitors NO₂ and PM₁₀), the Phoenix Park Station approximately 6.6km south east (which monitors PM₁₀) and the Ballyfermot Station approximately 7.7km south east (which monitors NO₂ and PM₁₀). The latest ratified and published monitoring results indicates that concentrations were below the annual mean and short-term (1-hour and 24-hour) Air Quality Assessment Levels (AQALs).

11.4 Construction Impacts

The assessment has been divided into an ‘unoccupied’ phase and partially ‘occupied’ phase scenarios. The outcome of the assessment (assuming no mitigation) is presented in Tables 11.1 and 11.2, the risk level is used to inform the selection of appropriate mitigation to ensure risk of impacts are reduced to negligible levels.

Table 11.1 Risk of Dust Impacts – Unoccupied (Unmitigated)

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Negligible	High Risk	High Risk	Low Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

Table 11.2 Risk of Dust Impacts – Occupied (Unmitigated)

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Negligible	High Risk	High Risk	Medium Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

11.5 Operational Impacts

The magnitude of change in annual mean NO₂ concentrations ranges from ‘imperceptible’ to ‘small’. On the basis of the NRA guidelines, the impact on annual mean NO₂ exposure can be described as ‘negligible’ at all receptors in each of the 2025, 2030 and 2040 assessment scenario years.

With respect to the 1-hour mean NO₂ AQAL, on the basis of empirical evidence the NRA guidelines state that ‘*the hourly mean standard is unlikely to be exceeded at roadside locations unless the annual mean is above 60µg/m³*’. On this basis and in consideration of the absolute predictions in annual mean

NO₂ concentrations, none of the receptor locations are considered likely to exceed the 1-hour mean AQAL.

The magnitude of change annual mean PM₁₀ concentrations at all receptors is 'imperceptible'. On the basis of the NRA guidelines, the impact on annual mean PM₁₀ exposure can be described as 'negligible' at all receptors in each of the 2025, 2030 and 2040 assessment scenario years. Following NRA guidelines the impact on 24-hour mean PM₁₀ concentrations is also predicted to be 'negligible'.

11.6 Mitigation Measures and Residual Impacts

11.6.1 Construction Phase

In order to control potential impacts, the mitigation and monitoring measures presented within Chapter 11 Table 11.22 are recommended.

11.6.2 Operational Phase

The road traffic emissions assessment predicts a 'negligible' impact on NO₂ and PM₁₀ concentrations. Therefore, no specific mitigation measures are required.

11.7 Cumulative Impacts

11.7.1 Construction Phase

On the basis that there are no other identified construction sites within the 350m screening distance there is not considered to be a risk of cumulative impact. However, in the event that surrounding developments come forward that are within the criteria, the measures proposed within this assessment for the Site and measures required to be implemented by other surrounding sites would produce a negligible impact and cumulative impacts would be considered 'not significant'.

11.7.2 Operational Phase

The baseline 'without development' traffic dataset includes for committed developments (see Chapter 11 Table 11.23) within the Hansfield Strategic Development Zone (SDZ), as such the traffic emissions assessment is cumulative in nature with corresponding trip rates and associated impacts on air quality accounted for within both 'with development' and 'without development' scenarios. As such the cumulative impacts are considered to be negligible and result in no significant effects.

12 Climate Change

12.1 Introduction

An assessment of potential climate impact has been undertaken for this project having regard to the evolving baseline, climate hazards, project vulnerability and greenhouse gas (principally carbon dioxide, CO₂) emissions.

12.2 Methodology

The assessment identified climate change concerns in relation to the proposed development, assessed effects and identified mitigation measures where possible. It also had regard to the likelihood and exposure / vulnerability of the proposed development to climate hazards, both now and in the future, and included a climate hazard impact analysis.

The GHG emissions were calculated in line with the GHG Protocol and publicly available carbon emission factors.

12.3 Existing Environment

Ireland has a typical maritime climate with relatively mild and moist winters and cool, cloudy summers. The prevailing winds are south westerly in direction. The climate is influenced by warm maritime air associated with the Gulf Stream which has the effect of moderating the climate, and results in high average annual humidity across the country.

12.4 Potential Impacts – Construction

The project is not considered to be particularly vulnerable to climate change events during construction phase, although some consideration will be given to reducing vulnerability and improving resilience to extreme rainfall events, localised flooding, storms and high winds.

Based on the scale and extent of the proposed development / activities at Barnhill, during construction phase the greenhouse gas emissions are assessed as not significant in the context of existing national carbon budgets.

12.5 Potential Impacts – Operational

The proposed development has been assessed to be almost certainly affected by extreme rainfall, flash (pluvial) flood, storms, and winds and heat. The proposed development would be likely affected by drought. The proposed development would be unlikely affected to cold spells, landslides and snow. The proposed development would not be affected by flood, wildlife fires and freeze –thaw damage. The proposed development will not be affected by rising sea level.

Based on the scale and extent of the proposed development / activities at Barnhill, the greenhouse gas emissions are assessed as not significant in the context of existing carbon budgets, which are currently mapped out to 2035. It is noted that for Ireland to reach their 2050 net zero target, the country's electricity supply will need to decarbonise, and for residential heating demand to be transitioned away from natural gas.

12.6 Mitigation Measures

In context of climate change, measures to increase the adaptive capacity of the proposed development and disaster risk reduction strategies can be developed with a view to reducing vulnerability and increasing the resilience of the planned development. Significant incidents related to the climate change that affect operation of the proposed strategic housing development should be recorded for future analysis.

Based on a development vulnerability assessment measure to improve the resilience of the project to extreme rainfall, flash flood, storms, and winds are required.

12.7 Monitoring

Measures will be implemented to assess and/or monitor greenhouse gas emissions and to reduce these wherever practically possible.

13 Cultural Heritage

An assessment of the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development was completed, in order to determine any significant impacts that may arise as a result of the development and highlight any potential effects this may have on these resources.

The assessment commenced with a desktop study / paper survey which considered all pertinent archaeological, architectural, historical, and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features. The assessment incorporated the results of an archaeological field survey, a programme of licenced archaeological testing of the lands and a built heritage inspection of upstanding buildings on site.

There are no records of any designated/protected monuments or designated architectural heritage structures (including protected structures) *within* the site boundary of the Proposed Development. A programme of licenced archaeological testing of the lands revealed a number of localised archaeological features (including three pits) within the site boundary of the Proposed Development. Also within the site boundary of the Proposed Development, is the site of the former Barnhill House (now demolished) along with a farmyard with associated structures that include a former dwelling (possibly of late-eighteenth- or early-nineteenth century in origin) and a number of associated stone-built outbuildings. All of the structures are much-modified and none are of architectural heritage interest.

The Archaeological Survey of Ireland record only one (1 No.) archaeological site within the 1km of the Proposed Development. This consists of a ring ditch (DU013-047----) located in the townland of Westmanstown; this is located approximately 350 metres to the south of the Proposed Development.

There are 3 No. Protected Structures located within the 1km study area. These comprise: Barnhill Bridge (Fingal RPS Ref. 0712), Pakenham Bridge (Fingal RPS Ref. 0711), and Westmanstown Park House (Fingal RPS Ref. 0717). All of these buildings/structures are included on the National Inventory of Architectural Heritage. None of these structures will be directly-impacted by the Proposed Development.

The Construction Phase will give rise to slight negative impacts on undesignated elements of the archaeological, architectural, and cultural heritage resource of the area. A number of archaeological features (including three pits) identified through licenced archaeological testing are located with an area proposed for development at the site. If development proceeds in this area, *preservation by record*, or archaeological excavation of these features, will be required. These works will be undertaken under licence to the National Monuments Service at the Department of Housing, Local Government and Heritage. Notwithstanding the proposed programme of archaeological excavation of the previously-identified features, a suitably qualified archaeological consultant shall be appointed to undertake licenced archaeological monitoring of all topsoil excavation during the construction phase of the development. This will also be under license from the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. Should additional archaeological or architectural heritage features, deposits or structures be uncovered during archaeological monitoring the NMS will be contacted and a strategy for the resolution of these features be formulated.

Prior to commencement of development, a building record of the derelict farm complex will be prepared by a suitably qualified historic building specialist. The resultant survey records will be submitted to Fingal County Council for archival purposes. Notwithstanding the lack of architectural heritage significance of the derelict buildings and other farmyard features, the proposed building record will allow for the full documenting of this much-altered farm complex of late-eighteenth or early-nineteenth-century origin.

There will be no effects on the archaeological, architectural or cultural heritage of the area through development activities that may occur during the Operational Phase.

14 Population and Human Health

14.1 Introduction

The assessment of potential impacts on Population and Human Health is contained within Chapter 14 of Volume II. It also details the proposed mitigation measures where necessary. The 2014 EIA Directive (2014/52/EU) updated the list of topics to be addressed in an EIAR and replaced 'Human Beings' with 'Population and Human Health'. This chapter also meets the requirement for assessment of 'Human Beings', as set out in Schedule 6 of the Planning and Development Regulations 2000 (as amended).

14.2 Methodology

The assessment of the likely significant effects of the proposed development on population and human health was conducted by reviewing the current socio-economic environment of the environs of the subject site. Along with carrying out a site visit and desktop visual assessments, a number of publications and date sources were consulted. These include:

- National Planning Framework 2040 (NPF)
- National Planning Framework – Implementation Road Map 2018
- Eastern and Midlands Regional Spatial and Economic Strategy (RSES) 2019
- Fingal County Development Plan (FDP) 2017- 2023
- Draft Fingal County Development Plan (draft FDP) 2023 - 2029
- Barnhill Local Area Plan (LAP) 2019
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education and Sciences (DES) website www.education.ie.
- TUSLA Childcare website <https://maps.pobal.ie/WebApps/TuslaInspectionReports/index.html>.
- Pobal website <https://maps.pobal.ie/WebApps/GeoprofilingReports/index.html>.

A Social Infrastructure Report, Childcare Demand Report and School Demand Report prepared by McCutcheon Halley Planning Consultants accompany this application under separate cover and were also consulted during the preparation of this chapter. This chapter is also informed by the Wind Microclimate Report prepared by Aecom under separate cover and the Daylight and Sunlight Assessment Report prepared by 3D Design Bureau. Consultations with statutory bodies were undertaken and further information on the consultation process is provided within Chapter 1 of the EIAR.

14.3 Existing Environment

The application site is located in the townlands of Barberstown, Barnhill, and Passifyoucan, at Clonsilla, Dublin 15 and is situated approximately 3 km to the west of Blanchardstown Centre and approximately 12.4 km to O'Connell Street, Dublin. Further details of the site location and description are provided in Chapter 2 of the EIAR.

The EIAR study area incorporates the red-line development boundary of the site and the immediate environs incorporating the Electoral Divisions¹ ("EDs") of Blanchardstown-Blakestown and Lucan North.

14.3.1 Population

The subject site falls within the Blanchardstown-Blakestown ED, which had a population of 38,894 in 2016. The data from the Census 2016 indicates that the total population for the Blanchardstown/Blakestown ED has increased by 7.3% (or 2,341 persons) since the previous census was undertaken in 2011. The population of Fingal County has grown by 7.4% (or 22,029 persons) in the same period. The Blanchardstown/Blakestown ED can therefore be considered to be representative of the electoral districts or suburban areas within the administrative area of Fingal County Council.

The Barnhill LAP envisages a total residential population of 3,500 for the LAP lands, based on the delivery of 900-1150 units. The FDP 2017 further identifies that the residential capacity for Blanchardstown up to the period 2023 is 11,757 residential units. The draft FDP sets a revised housing demand for Blanchardstown of 5,742 to 2029. This represents a decrease of 51% in the target demand from the FDP 2017 figures. The draft FDP continues to identify Barnhill LAP as a key area in the delivery of housing during the lifetime of the forthcoming development plan.

14.4 Impact Assessment

In identifying potential impacts and receptors, consideration was given to the proposed mixed use residential scheme and the identified receiving environment. The principal potential receptors that will be affected by the development proposals include;

1. Existing residential dwellings along Barberstown Lane North and by the R149;
2. Surrounding residential estates and dwellings;
3. Community Facilities and Services including;
4. Existing educational facilities such as pre-schools, primary schools and post-primary schools,
5. Social amenity facilities such as banks, the post office, library, churches, medical centres, dental surgeries.
6. Local amenities including community groups, clubs, societies as well as sports facilities and amenity walks;
7. Owners and employees of commercial activities;
8. Adjacent owners of agricultural land;
9. Temporary receptors such as passing traffic or pedestrians on the R149; Barberstown Lane North; and Barberstown Lane South;
10. Hansfield Train Station.

14.4.1 Do Nothing Scenario

If the proposed development is not realised, it is anticipated that the subject site would remain a vacant green field site, in the short to medium term. The application area is part of a significant landbank and is recognised in the Barnhill Local Area Plan as critical to provide for much needed housing, a crèche, amenities, and local centre, including land set aside for a Primary School.

¹ Electoral Divisions (EDs) are the smallest legally defined administrative areas in the State for which Small Area Population Statistics (SAPS) are published from the Census. There are 3,440 legally defined EDs in the Irish State. www.cso.ie

Given the fact that the lands are zoned for Residential Development and that there is a shortage of housing supply in County Fingal, should the proposed development not proceed it is likely that an alternative residential development proposal would be brought forward for consideration.

If no residential development proposal were to be brought forward, the lands would remain in agricultural use. The continued use of the lands for agriculture would be inconsistent with the policy objectives of the Fingal County Development Plan and the Barnhill LAP to deliver sustainable residential development on the lands. It would also result in lower patronage of the Hansfield Railway station and the Dunboyne to Clonsilla rail line, and would therefore be inconsistent with national, regional, and local policy objectives for enhanced use of sustainable transport modes.

14.5 Construction Phase Impacts

Generally, the potential impacts arising during the construction phase relate to quality of life including, noise, vibration, air quality, transport, visual impact/amenity. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimized or mitigated where appropriate.

No significant negative residual impacts have been identified once mitigation measures are put in practice. No significant negative impacts on population and economic activity are anticipated as a result of the construction phase of the proposed development.

An Outline Construction and Environmental Management Plan has been prepared which sets out the general measures which will be taken to ensure the site is secured and to ensure the health and safety of workers, on-site staff and those likely to be affected by the development including pedestrians, road users, neighbours and visitors to the site. The measures include;

- Health and safety policies on the site, including a main contractor's construction stage health and safety plan which will be prepared by the project supervisor for the construction stage;
- Site security and suitable hoarding to separate the site from surrounding roads and buildings;
- Controlled hours of operation and management of construction traffic to minimise movements;
- Wheel-washing facilities and the use of appropriate water-based dust suppression systems

Following implementation of these measures adverse effects on human health and local amenity during the construction phase of the project are not likely, and any effects will be negative, imperceptible to slight and short term.

14.6 Operational Phase

The proposed development complies with the statutory land use zoning and will consist of 1,243 residential units, a village centre, access to Hansfield Station via a railway plaza, land set aside for primary school of a minimum of 16-classrooms, a public park of approximately 5.6 hectares and a series of pocket parks throughout the development and the development of a cycle/pedestrian priority route along part of the existing Barberstown Lane North (L-7010-0).

Due to the nature of the development, there will be few hazards associated with the operational phase of the development and therefore no potential significant negative impact in terms of health and safety. The provision of a public park and the development of a cycle/pedestrian priority route will likely result in a positive impact on cycling and pedestrians. The proposed layout provides for excellent public amenity and recreational facilities including a playing pitch, multi-use games area, skateboard park, playgrounds, walking/jogging routes and a wetland area. The provision of these amenity facilities within the proposed development will be of benefit to future residents and existing residents in the local environs. The operational phase of the proposed development, in terms of recreation and amenity facilities will, therefore, have a positive, significant, permanent impact on Human Health and local amenity.

Prior to the delivery of the crèche facility there is likely to be a negative, slight, short-term effect on local amenity in the area. Existing and proposed crèche facilities within the local area have the potential capacity to cater for this initial shortfall in demand. Once the crèche has been constructed it will be able to accommodate demand arising from the development and thus it is unlikely to have a negative effect on local amenity.

As the proposed development includes the provision for a primary school to meet the demand generated by the development, and post-primary school demands can be met by schools in the local

area, the impact of the proposed development on school provision is likely to be neutral to slight negative, the extent of the impact will be local and the duration of the impact permanent.

The proposed development is unlikely to have a negative effect on healthcare services.

14.7 Cumulative Impacts

The Hansfield SDZ comprises of a number of developments in the vicinity of the EIAR study area which in combination with the proposed development could have cumulative impacts. These were considered during the construction phase and operational phase.

14.7.1 Construction Phase

Subject to the appropriate permission, once the development commences the construction phase will take place in 5 phases over an estimated 7-year and 10-month period beginning in 2025. Given the timeframes associated with the proposed development and the existing permitted applications it is considered unlikely that there will be significant overlap in the construction periods. In addition to this access to the proposed development during the construction phases will be from the realigned Barberstown Lane South Road. Construction traffic for the Hansfield SDZ will not use this route and access to the site will be segregated via 2 roundabouts with one designated for construction traffic and one for public/local traffic. Once the proposed traffic management measures within the CEMP are put in place there will be no risk of significant construction phase cumulative impacts with other proposed developments.

14.7.2 Operational Phase

Both Hansfield SDZ and the proposed development comply with the land-use objectives and national planning policy to deliver high-quality housing in areas that are serviced by public transport modes. Both projects will increase the patronage of Hansfield Station which will have a positive, permanent effect on local amenity.

The operational phase of both projects has the potential for a moderate negative cumulative effect in terms of a deficit of post-primary school places unless additional capacity is delivered within existing schools.

The operational phase of both projects is not considered to have any other significant negative cumulative impacts on human health, population and economic activity or local amenity.

14.8 Mitigation

In mitigation for the potential cumulative negative effect of a deficit in post-primary school places, should permission be granted, the applicants will submit an updated report to the Department of Education detailing the proposed phasing and estimated primary and post-primary demands arising from the development to inform continuing Department investment decisions. The applicants will also provide an annual report of progress to the Department of Education noting the number of completed units, estimates of primary and post-primary demands arising and projections for future demand when the development is complete.

No other likely negative impacts have been identified for population, or land use, accordingly no further mitigation measures are required.

In relation to the demolition, site enabling works and construction phases, health and safety risks will be managed in accordance with the Safety, Health and Welfare at Work (Construction) Regulations, 2013. Health and safety considerations and measures are set out in the OCEMP.

14.9 Monitoring

Measures to avoid negative impacts on Population and Human Health have been integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.

Monitoring of compliance with Health and Safety requirements will be undertaken by the Project Supervisor for the Construction Process.

14.10 Residual Impacts

The proposed mitigation measures will avoid, prevent, or reduce impacts on the human environment during the construction and operational phases of the proposed development. Residual impacts are those which remain following the implementation of the proposed mitigation measures.

There is a potential for a residual cumulative negative moderate effect on post-primary education facilities if additional capacity is not provided by the Department of Education. The applicant will seek to avoid this residual effect by providing annual reports of the progress of the development and associated post-primary demands to the Department of Education to inform investment decisions. No further significant adverse residual impacts have been identified.

The land will have an urban character, rather greenfield. However, this change is in context with the specific zoning of the site in the Barnhill LAP and the impact is considered acceptable when balanced with the other positive impacts on amenity, such as the provision of active public amenity spaces, much needed housing in the County wide context, employment and local services.

15 Major Accidents and Disasters

15.1 Introduction

It is a requirement of most Environmental Impact Assessment Reports to include a chapter describing the vulnerability of the Proposed Development to Major Accidents and Disasters (MA&D).

A major accident is defined as an event such as a major fire or explosion, train derailment or major road traffic accident that threatens immediate or delayed serious effects to human health, welfare and/or the environment. Disasters can be naturally occurring, such as an earthquake, or man-made such as damage to protected heritage sites during construction activities. MA&Ds are events such as these which have a low likelihood of occurring, but if they do occur, the consequences could be significant and potentially require the support of emergency services and other organisations.

15.2 Methodology

The assessment of MA&Ds involves the identification of credible, worst case event scenarios which could occur over the lifetime of the Proposed Development. For each scenario identified, the scale of the impact is then determined which takes into consideration the potential duration, extent, frequency, and severity of the event. The scale of the event is then compared to the measures which will be in place to reduce the risk of such an event occurring and conclude if the proposed measures are sufficient or if additional risk reduction is required.

This assessment of MA&Ds is not numerical, risks are described using descriptive terms rather than values of frequency and consequence.

15.3 Existing Environment

The location of the Proposed Development is predominantly rural and there are no major industrial installations such as power stations in the surrounding area. Consequently, the risk of an impact from existing installations on the Proposed Development is low. Equally, the risk of a major accident or disaster from construction or operation of the Proposed Development on an existing industrial site is also low.

15.4 Potential Impacts – Construction

The assessment of MA&D which has been carried out for the Proposed Development has considered a wide range of credible event scenarios. These include for example, the presence of substances which could cause harm, such as cement and lime used in construction. If storage systems were to fail and cement was released in sufficient quantities, reaching a stream or canal, this could cause harm to the environment.

The proximity of electrical distribution transmission towers or pylons were also considered. If these systems are damaged, for example via a crane strike during construction, people could be harmed, and local residents could lose their power supplies.

Detailed environmental protection plans will be developed for construction activities, which will be carefully managed to reduce the potential for accidents such as the release of cement and other harmful substances. These plans will also include measures to protect transmission towers during construction and reduce the risk of workers coming into contact with high voltage electricity.

15.5 Potential Impacts – Operation

Natural gas distribution pipework installed at the Proposed Development will supply the properties with fuel for heating and cooking. A release of natural gas caused for example by damage to pipework, could result in a fire or explosion which could result in harm to people and damage to properties. Regulations and industry codes will be followed for the design and installation of gas pipework. These standards are required to minimise the risk of damage occurring, such as the specification of pipework material and thickness, and the depth at which they are to be installed below ground.

The location of the Proposed Development was considered in relation to the potential for disasters such as flooding which could occur during major storms, causing damage to properties and potentially harm to people affected by flood water. Detailed studies have been carried out which established the risk of flooding in the area is low. Drainage systems will be appropriately designed to accommodate storm water volumes which are established within engineering standards and codes.

15.6 Potential Impacts – Cumulative

MA&D are by nature low probability events, therefore the risk of more than one occurring at the same time is very low. There are a few credible scenarios involving more than event, such as a gas explosion which damages water supply pipework causing localised flooding, however this would be considered as one major accident.

15.7 Mitigation Measures

The conclusions of the assessment carried out for the Proposed Development were that the location and type of development proposed results in a low risk of a major accident or disaster occurring.

The key mitigation measures in place to reduce risk over the lifecycle of this development include the following:

- An appropriate location, not within an area near to industrial infrastructure or at risk of flooding.
- Compliance with all applicable legislation and building standards.
- The engineering design of infrastructure including the supply of utilities such as natural gas, water, and power.
- Development and adherence to a Construction Environmental Management Plan (CEMP).

16 Significant Interactions of Impacts

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter describes the significant interactions of impacts identified in the previous chapters. All potential inter-relationships impact between the various areas covered in the EIAR are listed and the key interactions and interrelationships are summarised. Mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted. A schedule of proposed mitigation measures and monitoring measures is presented in Chapter 17.

17 Schedule of Mitigation Measures and Monitoring

Chapter 17 of the Environmental Impact Assessment provides a summary of the construction and operational phase mitigation measures proposed for each discipline throughout the EIAR document. These are reflective of those measures identified in the Outline Construction Environmental Management Plan (CEMP) which sets out construction phase mitigation measures for the proposed development. It will be a requirement that all personnel will understand and implement the final agreed

CEMP. An Outline Construction and Demolition Waste Management Plan has also been prepared at Section 7 of the Outline CEMP.

Some disciplines have proposed monitoring following their assessment of impacts and implementation of proposed mitigation measures. Monitoring will take place after consent is granted in order to demonstrate that the project in practice conforms to the predictions made during the EIA process. Monitoring provides assurance that proposed systems are operating as intended. This allows adjustments of operations to be made to ensure continued compliance with consent conditions such as emission limit values, conditions of operation, performance criteria / indicators and detection of unexpected mitigation failures.