Figure 9.6: Façade Mitigation

The overall R_w and $D_{ne,w}$ outlined above are provided for information purposes only. The over-riding requirement is that the internal noise criteria is achieved, other combinations of upgraded glazing and ventilation may provide the same or better performance than those outlined within this report.

In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Wall Construction
In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB Rw for this construction.

Internal Noise Levels
Taking into account the external façade levels and the specified acoustic performance to the building envelope, the internal noise levels have been calculated. For all buildings within the development site, the good internal noise levels are achieved with windows closed.

9.6 RESIDUAL IMPACT ASSESSMENT

9.6.1 CONSTRUCTION PHASE

Due to the minimal distances between construction works and receptor locations it is predicted that construction noise levels will at times exceed the recommended BS5228 criteria at receptor locations, and hence impacts will range from **slight to significant and temporary** at these locations.

Note that for NSLs 2, 4 and 5 it is predicted that construction works will be within the thresholds for the large majority of the construction phase, only during rock breaking works are noise levels predicted to exceed the threshold.

9.6.2 OPERATIONAL PHASE

Residual effects from noise as a result of a change in traffic volumes is predicted to be negative, **imperceptible and long-term**.

Noise levels associated with building services plant are expected to be within the adopted day and night-time noise limits at the nearest noise-sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of **negative, not significant and long-term**.

Inward noise impacts are mitigated through installation of upgraded acoustic glazing and ventilation where specified resulting in a **neutral, not significant and long-term impact**.

9.6.3 CUMULATIVE IMPACT

It's noted that there are several permitted phases to the Ladywell developments within the local area. There is the potential for the highest construction noise levels to increase by approximately 3 dB at receptor locations should two adjacent sites be constructed simultaneously. However, this would only occur during peaks in construction noise over short periods.

The following sites were identified which may have coinciding construction phases with that of the proposed development, these include:

- Previous phases of the masterplan site: Phase 3A, Phase 3B and Phase 3C Ladywell;
- Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and
- Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

The likeliest cumulative impacts to occur would be an increase in duration of construction works impacts for each receptor, although activities would likely remain temporary in nature with the overall construction period remaining short-term.

9.7 SIGNIFICANT INTERACTIONS

This chapter has used information from the Traffic chapter and the architectural drawings to inform the assessment of noise and vibration impacts. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are

assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible due to the low-level changes in traffic flows associated with the proposed development.

9.8 REFERENCES

- Dublin Agglomoration Noise Action Plan 2018 - 2023.
- Fingal County Development Plan 2023 – 2029.
- BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.
- British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound
- Design Manual for Roads & Bridges – LA111 Revision 2, 2020.
- British Standard BS 5228 (2009 +A1 2014): Code of Practice for Control of Noise and Vibration on Construction and Open Sites Part 1: Noise & Part 2: Vibration.
- British Standard BS 7385 (1993): Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- Calculation of Road Traffic Noise, Department of Transport Welsh Office, HMSO, 1988.
- ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.
- ISO 9613 (1996): Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.
- EPA Advice Notes for Preparing Environmental Impact Statements, (May 2022).
- Professional Guidance on Planning & Noise (ProPG), (IoA, 2017).

10.0 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

10.1 INTRODUCTION

This chapter assesses the potential landscape/townscape and visual impacts of a proposed Large-scale Residential Development (LRD) on lands at Folkstown (Phase 4) within the townlands of Clonard or Folkstown Great in Balbriggan, Co. Dublin

The chapter should be read in conjunction with the book of verified photomontages contained in Appendix G, Volume III of the EIAR, and also as a standalone document.

10.2 STATEMENT OF AUTHORITY

This chapter was prepared by Richard Butler of Model Works Ltd. Richard has degrees in Landscape Architecture and Town Planning and is a member of the Irish Landscape Institute and the Irish Planning Institute. He has over 25 years' experience in Landscape/Townscape and Visual Impact Assessment. In the last number of years, he has prepared LVIA chapters for EIAR for the following projects among others:

- St Vincent's Hospital and Residential Development, Fairview, Dublin;
- Guinness Quarter, James's Street, the Liberties, Dublin;
- Sandford Road LRD, Dublin;
- Emmet Road SHD, Inchicore, Dublin;
- O'Devaney Gardens SHD, Dublin;
- Howth Road SHD, Howth, Co. Fingal;
- Dublin Arch (Connolly Quarter);
- Augustine Hill (Ceannt Station), Galway;
- Pembroke Quarter (Irish Glass Bottle and Fabrizia sites) Phases 1, 1b, 2, A, Ringsend, Dublin;
- St Joseph's House and Adjoining Properties SHD, Dun Laoghaire Rathdown;
- Charlestown Place SHD;
- Parkside 4 SHD and Parkside 5B and 6 SHD, Dublin;
- Scotch Hall SHD, Drogheda;
- Griffith Avenue SHD, Dublin;
- Concorde SHD, Dublin.

10.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 197 no. dwellings ,open space, and ancillary infrastructure will facilitate Phase 4 of the lands at Folkstown in Balbriggan as follows:

129 no. terraced and semi-detached houses comprising 55 no. 2-bedroom houses (2 storey), 67 no. 3-bedroom houses (2 storey) and 7 no. 4-bedroom houses (3 storey) [house types with variants];
18 no. terraced and semi-detached 3 bedroom townhouse dwellings; 18 no. Later Living Units 8 no. 1 bedroom & 10 no. 2 bedroom – all bungalows) [house types with variants];
12 no. 1 bedroom Maisonettes in 6 no. 2-storey semi-detached buildings, and 4 no. 1 bedroom apartments in a 3-storey building (all apartments with terraces) along with 1 no. retail/café unit (c.165 sq. m) and 1 no. retail/medical unit (c. 185 sq. m) [including '*back of house area'* & both units to be able to be sub-divided and amalgamated].
16 no. duplex apartments (comprising 8 no. 1 bedroom [with terrace] and 8 no. 3 bedroom units) in 4 no. 3 storey buildings;
Public open space c.0.85 hectares (with an additional c.0.76 hectares of riparian corridor open space), hard and soft landscaping (including public lighting & boundary treatment) and communal/semi-private open space (c. 660 sq. m) for the proposed townhouse, duplex and apartment units;

Vehicular access will be provided via the Boulevard Road along with the provision of car parking spaces (280 no.), bicycle parking spaces and all internal roads and footpaths and bicycle and bin stores;
Provision of surface water attenuation measures, (including widening of Clonard Brook), connection to water supply, provision of foul drainage infrastructure to Irish Water specifications and all ancillary site development, construction, and landscaping works [and temporary construction access from local road L1130];
The proposal will also amend the layout to elements of the shared layout across the permitted phases to include (Phase 3A [F21A/0055;ABP Ref:312048-21] relating to 29 no. dwellings replaced with 26 no. dwellings, Phase 3B [F22A/0526] relating to layout and Phase 3C [F22A.0670] relating to 3 no. dwellings replaced with 4 no. dwellings and associated amendments to attenuation (Clonard stream) and services.
Signalised upgrade of the junction of Boulevard Road and the Clonard Road (R122).

10.4 METHODOLOGY FOR LANDSCAPE AND VISUAL IMPACT ASSESSMENT

The LVIA was prepared with reference to:

- *Guidelines for Landscape and Visual Impact Assessment*, 3rd edition, 2013 (GLVIA), published by the Landscape Institute;
- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, 2022, published by the EPA;
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*, 2018, published by the Department of Housing, Planning and Local Government.

The EPA guidelines 2022 provide a general methodology and impact ratings for all EIA topics. The GLVIA provides specific guidelines for landscape and visual impact assessment. Therefore, a combination of the EPA guidelines and the GLVIA has informed the methodology for this assessment.

10.4.1 KEY PRINCIPLES OF THE GLVIA

10.4.1.1 Use of the Word 'Townscape'

The GLVIA recommends that the word 'townscape' be used (instead of landscape) in urban areas, where a proposed development's receiving environment is dominated by built elements. The GLVIA defines townscape as *"the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces and the relationship between buildings and open spaces"*. Since the subject site is located in a developing urban environment, the word townscape is used in this chapter.

10.4.1.2 Assessment of Both 'Townscape' and 'Visual' Effects

The GLVIA requires that effects on views/visual amenity be assessed separately from the townscape effects, although the two topics are inherently linked.

- *'Townscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations and spatial distribution of these elements create variations in landscape or townscape character. Landscape/Townscape impact assessment identifies the changes to this character which would result from the proposed development, and assesses the significance of those effects on the landscape or townscape as a resource.*
- *Visual impact assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.*

10.4.2 METHODOLOGY FOR ASSESSMENT OF TOWNSCAPE EFFECTS

The assessment of potential townscape effects involves (a) classifying the sensitivity of the townscape, (b) classifying the potential magnitude of townscape change which would result from the proposed development, and (c) combining these factors to arrive at an assessment of significance of the effects - and the quality of the effects (positive, neutral or negative).

10.4.2.1 Townscape Sensitivity

The sensitivity of the townscape is a function of its character, which may be determined by its land use pattern, urban grain, building typologies and architecture, cultural and natural heritage elements (including vegetation and drainage features), and the quality of the public realm. These factors determine the value that is placed on the townscape. The policy pertaining to the area (e.g. the land use zoning), and any related trend of change, are taken into account. The nature and scale of the proposed development are also considered (a particular townscape can have varying sensitivity to different development types). Five categories are used to classify sensitivity, as set out in (Table 10.1).

Table 10.1: Categories of Townscape Sensitivity

Sensitivity	Description
Very High	Areas where the townscape exhibits very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The townscape character is such that its capacity to accommodate change is very low. These attributes are recognised in policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the townscape exhibits strong, positive character with valued elements, features and characteristics. The townscape character is such that it has limited/low capacity to accommodate change. These attributes are recognised in policy or designations as being of national, regional or county value and the principal management objective for the area is the conservation of existing character.
Medium	Areas where the townscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The townscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate townscape character or facilitate appropriate, necessary change.
Low	Areas where the townscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no significant change or would make a positive change. Such townscapes are generally unrecognised in policy and the principal management objective may be to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the townscape exhibits negative character, with no valued elements, features or characteristics. The character is such that its capacity to accommodate change is high; where development would make no significant change or would make a positive change. Such townscapes include derelict industrial lands, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the townscape through development, repair or restoration.

Note on definitions used in this assessment

The definitions in Table 10.1 (townscape sensitivity), 10.2 (magnitude of townscape change), 10.4 (viewpoint sensitivity) and 10.5 (magnitude of visual change) are not taken from either the GLVIA or the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022. Both of these guidance documents require that classifications of sensitivity and magnitude of change (such as high, medium, low, etc.) be used in the assessment process (see EPA Guidelines Figure 3.4 and GLVIA Box 3.1, Paragraph 3.26 and Figure 3.5) but neither guidance document provides definitions for such classifications.

The GLVIA specifically avoids being prescriptive in this regard (GLVIA paragraph 1.20): *"The guidance concentrates on principles... It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances."*

The EPA Guidelines state (in Section 3, p.49): *"While guidelines and standards help ensure consistency, the professional judgement of competent experts can play an important role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood."*

The GLVIA and EPA Guidelines thus require that the factors used in arriving at significance conclusions (i.e., classifications of sensitivity and magnitude) should be explained in the EIAR, but the guidelines do not provide the explanations themselves.

It is for this reason that the definitions in Tables 10.1, 10.2, 10.4 and 10.5 are provided in this section. These definitions have been developed and refined by LVIA practitioners in Ireland and the UK, including the chapter author, over decades of practice. They are not standard, i.e., the classifications/definitions used in this assessment may differ from those used by other practitioners. However, the author considers them to be reasonable and appropriate for the purpose of classifying the significance of landscape/townscape and visual effects and the same definitions have been used in many previous LVIA reports/chapters prepared by the author and accepted by the planning authorities.

10.4.2.2 Magnitude of Townscape Change

Magnitude of change is a factor of the scale, extent and degree of change imposed on the townscape by a development, with reference to its key elements, features and characteristics, and any affected surrounding character areas (also known as 'townscape receptors'). Five categories are used to classify magnitude of change (Table 10.2).

Table 10.2: Categories of Townscape Change

Sensitivity	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the townscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the townscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the townscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the townscape character.

(Refer to note on definitions following Table 10.1)

10.4.2.3 Significance of Effects

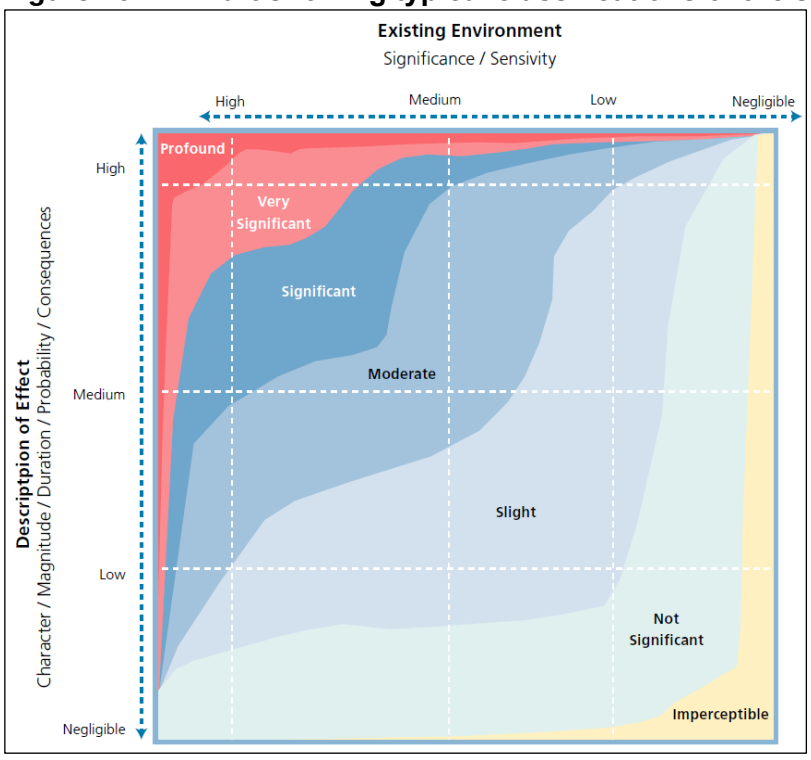
To classify the significance of effects the magnitude of change is measured against the sensitivity of the townscape using the guide in Table 10.3 below.

Table 10.3: Guide to Classification of Significance of Townscape and Visual Effects

		Sensitivity of the Townscape/View				
		Very High	High	Medium	Low	Negligible
Magnitude of Townscape/Visual Change	Very High	Profound	Profound to Very Significant	Very Significant to Significant	Moderate	Slight
	High	Profound to Very Significant	Very Significant	Significant	Moderate to Slight	Slight to Not Significant
	Medium	Very Significant to Significant	Significant	Moderate	Slight	Not Significant
	Low	Moderate	Moderate to Slight	Slight	Not significant	Imperceptible
	Negligible	Slight	Slight to Not Significant	Not significant	Imperceptible	Imperceptible

The matrix (Table 10.3) above is derived from the EPA Guidelines 2022 (Figure 3.4 of the Guidelines – see below).

Figure 10.1: 'Chart showing typical classifications of the significance of impacts'



(Source: Figure 3.4 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022)

The matrix (Table 10.3) and the EPA chart (Figure 10.1) are only a guide to the classification of impact significance. The assessor also uses professional judgement informed by their expertise, experience and common sense to arrive at a classification that is reasonable and justifiable. In the EPA guidelines the chart above is accompanied by a footnote that states: *"The depiction of significance classifications is indicative and should not be relied on as being definitive. It is provided for general guidance purposes"*

(EPA guidelines Section 3, page 53; emphasis added). For example, according to the EPA chart a change of high magnitude affecting a receptor of medium sensitivity could be classified as either 'significant' *or* 'moderate'. That judgement must be made by the assessor.

10.4.3 METHODOLOGY FOR ASSESSMENT OF VISUAL EFFECTS

Assessment of visual effects involves identifying a number of key/representative viewpoints in the site's receiving environment, and for each one of these: (a) classifying the viewpoint sensitivity, (b) classifying the magnitude of change which would result in the view (informed by photomontages of the proposed development), and (c) combining these factors to arrive at a classification of significance of the effects on the view.

10.4.3.1 Sensitivity of the Viewpoint/Visual Receptor

Viewpoint sensitivity is a function of two main considerations:

- **Susceptibility of the visual receptor to change**. This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention is focused on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage attractions and places of congregation where the setting contributes to the experience. Visual receptors less sensitive to change include travellers on road, rail and other transport routes (unless on recognised scenic routes), people engaged in outdoor recreation where the surrounding landscape does not influence the experience, and people in their place of work or shopping.
- **Value attached to the view**. This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

Five categories are used to classify a viewpoint's sensitivity (Table 10.4):

Table 10.4: Categories of Viewpoint Sensitivity

Sensitivity	Description
Very High	Iconic viewpoints (views towards or from a townscape feature or area) that are recognised in policy or otherwise designated as being of national value. The composition, character and quality of the view are such that its capacity for change is very low. The principal management objective for the view is its protection from change.
High	Viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (e.g. views from houses or outdoor recreation amenities focused on the townscape). The composition, character and quality of the view may be such that its capacity to accommodate change may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity.
Medium	Views that may not have features or characteristics that are of particular value, but have no major detracting elements, and which thus provide some visual amenity. These views may have capacity for appropriate change and the principal management objective is to facilitate change to the composition that does not detract from visual amenity, or which enhances it.
Low	Views that have no valued feature or characteristic, and where the composition and character are such that there is capacity for change. This category also includes views experienced by people involved in activities with no particular focus on the landscape. For such views the principal management objective is to facilitate change that does not detract from visual amenity or enhances it.
Negligible	Views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g. in derelict landscapes). For such views the principal management objective is to facilitate change that repairs, restores or enhances visual amenity.

(Refer to note on definitions following Table 10.1.)

10.4.3.2 Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral view, or in glimpses). It also takes into account the geographical extent of the change, as well as the duration and reversibility of the visual effects. Five categories are used to classify magnitude of visual change to a view (Table 10.5):

Table 10.5: Categories of Magnitude of Visual Change

Sensitivity	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

(Refer to note on definitions following Table 10.1.)

10.4.3.3 Significance of Visual Effects

As with townscape effects, to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guidance in Table 10.3 and Figure 10.1 above.

10.4.4 QUALITY OF EFFECTS

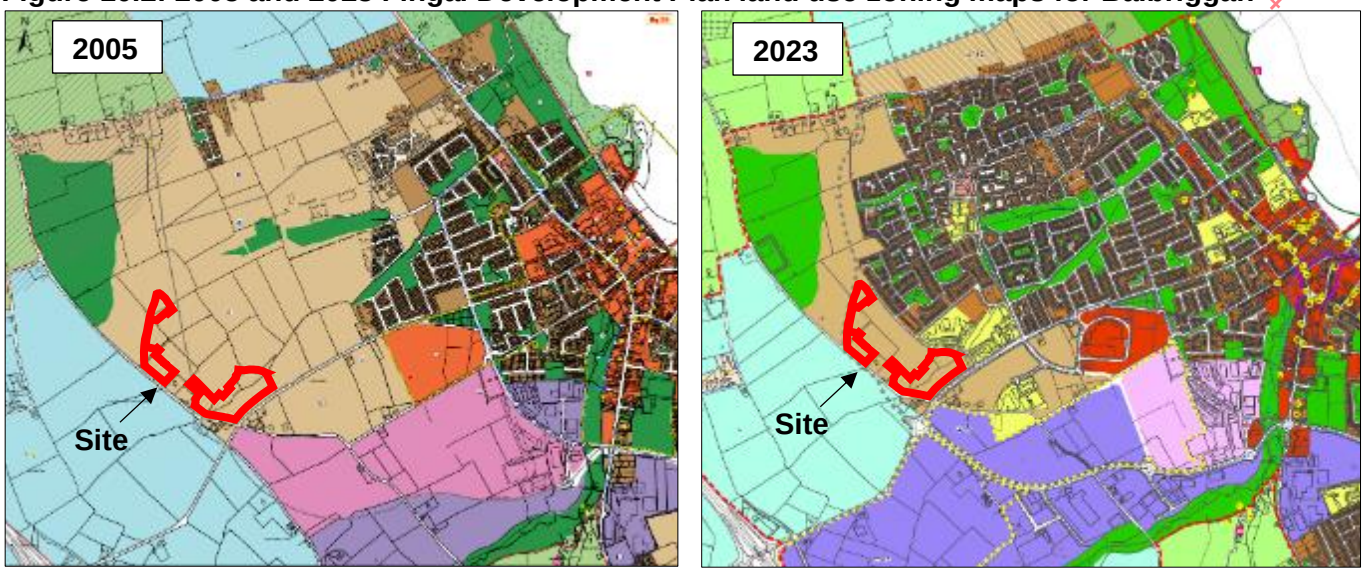
In addition to predicting the significance of the effects, EIA methodology requires that the quality of the effects be classified as positive/beneficial, neutral, or negative/adverse. For townscape to a degree, but particularly for visual effects, this is an inherently subjective exercise. This is because townscape and visual amenity are perceived by people and are therefore subject to variations in the attitude and values - including aesthetic preferences - of the receptor. One person's attitude to a development may differ from another person's and thus their response to the effects of a development on a townscape or view may vary.

Additionally, in certain situations there might be policy encouraging a particular development in an area, in which case the policy is effectively prescribing townscape and visual change. If a development achieves the objective of the policy the resulting effect might be considered positive, even if the townscape character or views are profoundly changed. The classification of quality of townscape and visual effects should seek to take these variables into account and provide a reasonable and robust assessment.

10.5 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The site is located at the western edge of Balbriggan in an area undergoing transformational landscape change, from its previously rural/agricultural condition to an urban landscape – or townscape. The process has been plan-led, with the area having been zoned for residential development for several cycles of the Fingal Development Plan (FDP). The land use zoning maps from the 2005 and 2023 Development Plans below show the westward expansion of Balbriggan in the last two decades.

Figure 10.2: 2005 and 2023 Fingal Development Plan land use zoning maps for Balbriggan



In addition to the change that has already taken place (illustrated by the comparative maps above), there have been several planning applications recently permitted by Fingal County Council (FCC), which when implemented will further expand the urban area and change the site's landscape context. These include:

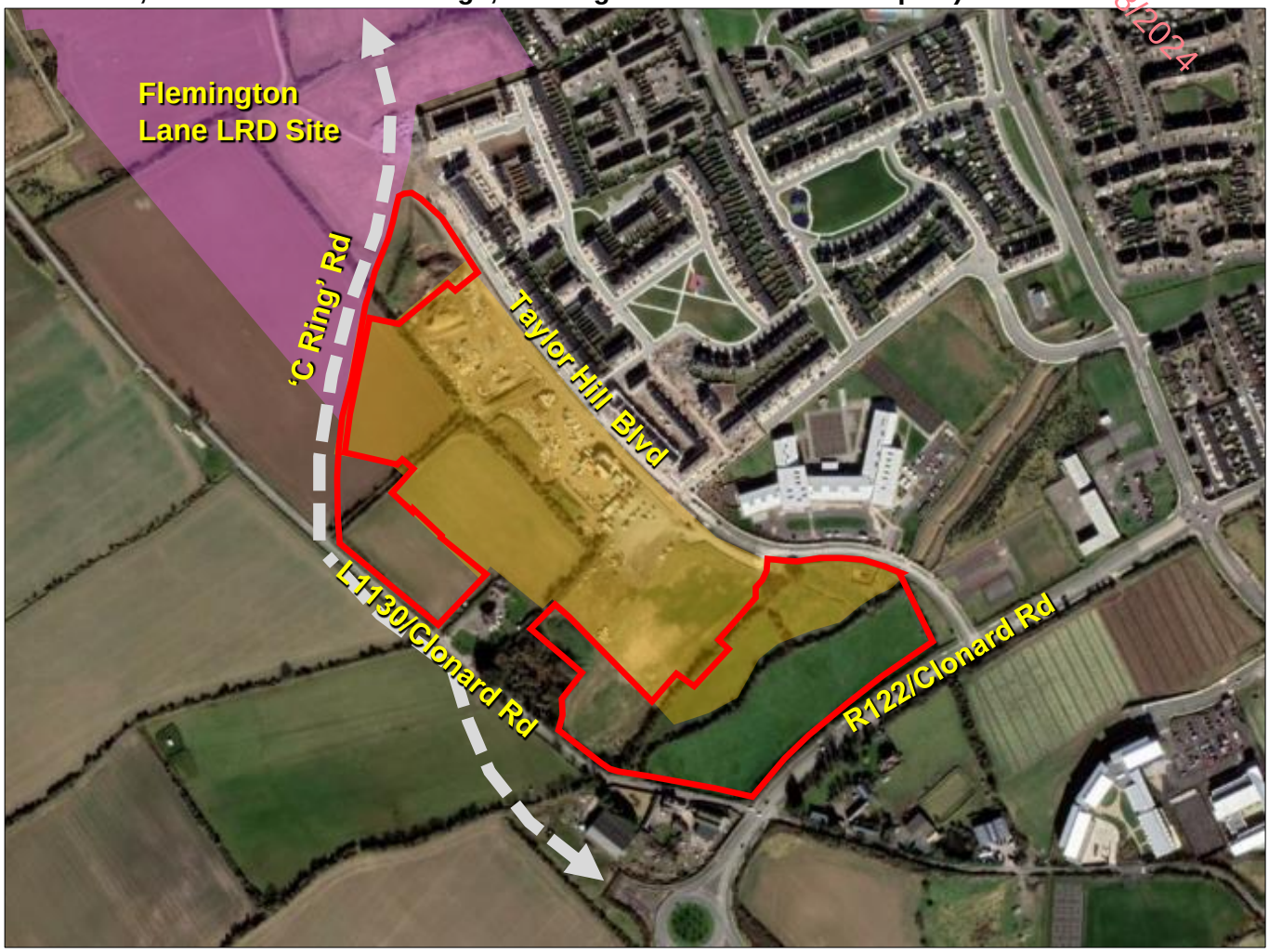
- Reg. Ref. F21A/0055 (left below)
- Reg. Ref. F22A/0670 (middle below)
- Reg. Ref. F22A/0670 (right below)

Figure 10.3: Site plans of permitted developments adjacent to the subject site

These permitted developments (known as Ladywell Phases 3A, 3B and 3C) are all located on the parcel of land contained between the R122/Clonard Road (to the southeast), Taylor Hill Boulevard (to the north east), L1130/Clonard Road to the south west, and the future 'C Ring' Road to the west (see Figure 10.4 below).

The subject site is the remaining land in this parcel, lying between the three Ladywell Phase 3 developments and the surrounding roads. This gives the site (and the proposed development) particular importance in the future townscape, as it will form the urban edge of a part of Balbriggan, as seen from key roads approaching and accessing the urban area.

Figure 10.4: The site and immediate environs (subject site outlined red; combined sites of Ladywell Phases 3A, 3B and 3C shaded orange; Flemington Lane LRD shaded pink)



In addition to the three Ladywell Phase 3 developments immediately adjacent to the site, in July 2024 permission was granted for a Large-scale Residential Development of 564 no. units on the lands to the north of the site across the C Ring Road (Flemington Lane LRD, Reg. Ref. LRD0006/S3; Bord Pleanála LH06F.319343). This development, which straddles a section of the C Ring Road to the north, includes houses, duplex units and apartments in buildings up to five storeys tall, and nine commercial units. It will also provide a part of the large Class 1 public open space to the north of the site along the L1130.

Figure 10.5a: A view of the permitted Flemington Lane LRD to the north of the site, along the C Ring Road

10.5.1 IMPLICATIONS OF THE ZONING AND THE TRANSITIONAL CONDITION OF THE BASELINE ENVIRONMENT FOR THIS ASSESSMENT

The RA '*Residential Area'* zoning of the subject site and adjacent lands in the FDP, the related ongoing urban development in the area, and the recent positive planning decisions for Ladywell Phases 3A, 3B and 3C have implications for the assessment the proposal's landscape/townscape and visual impacts. These indicate that the existing landscape is transitional. They point towards the 'future townscape', which is the baseline scenario against which the proposed development should be assessed.

The principle of the site's development for residential use, and the related landscape and visual change, has been deemed acceptable - through the process of Strategic Environmental Assessment of the FDP, and as indicated by the planning decisions for the neighbouring sites. The pertinent questions for this assessment are, therefore, whether the proposed development would:

(a) Comply with the landscape/townscape and visual amenity-related policies and objectives of the FDP - for example the objective to retain trees and hedgerows;
(b) Avoid significant negative effects on any sensitive receptors in the immediate environment;
(c) Integrate with, and complement, the existing and permitted neighbouring developments to create a new neighbourhood of appropriate townscape character and a high level of visual amenity.

For this reason, this assessment focusses on the site and its immediate receiving environment more so than the wider environs. (It is considered that the visibility of the development on the site from the wider environs could not constitute 'significant' impact, when the site lies within the urban footprint, is zoned for development, and is adjacent to other similar developments (existing and permitted).

10.5.2 THE SITE

10.5.2.1 Landcover and vegetation

Although parts of the site (for which planning permission has already been granted) and much of the surrounding area is disturbed by recent/ongoing development, parts of the site remain in agricultural use, comprised of grassland fields divided by mature hedgerows. The hedgerows and trees within the site and around the perimeter (for example along the R122/Clonard Road) are key landscape features and potential green infrastructure (GI) assets of the townscape.

10.5.2.2 Topography and drainage

A narrow stream (Clonard Brook) traverses the south eastern part of the site, flowing east towards the coast. The banks of the stream are densely vegetated. In addition to its natural heritage value, the stream marks the boundary between two townlands. It is thus also a cultural heritage feature. To the north east of the site, the Clonard Brook has been developed as a green/blue corridor, with footpaths either side of the channel. It passes between Coláiste Ghlór na Mara and St George's National School and connects to the open space network of the neighbourhood to the east.

10.5.2.3 Agricultural Lands to South West

To the south west, across the L1130/Clonard Road from the site, is an area of large grassland and tillage fields, extending to the M1 motorway (c. 850m from the site) and beyond. This area is zoned RU 'Rural' in the FDP 2023, and will thus stay in agricultural use. It is sparsely populated, with just a small cluster of rural houses at Grougha, some 500m to the west of the site, surrounded by fields.

10.5.2.4 Surrounding Roads

- **The R122/Clonard Road** passes along the south east boundary of the site. This is the main approach road to Balbriggan from the M1, and is thus a key element of the urban structure. It also carries a large volume of potential visual receptors, although as road users entering an urban area they are not highly sensitive to the type of development proposed. The road is two lanes wide with green verges and segregated pedestrian and cycle paths on both sides. Outside of the these are hedgerows and/or tree lines which give the road a verdant character despite its urban location/function.
- **The L1130/Clonard Road** passes along the south western boundary of the site. This carries traffic from Balbriggan's northern hinterland into the town. It is a narrow country road flanked by ditches and hedgerows on both sides. A stretch of the road along part of the site boundary is due to be widened/improved to form part of the C Ring Road.
- **Taylor Hill Boulevard** runs west from the R122 along the site's north eastern boundary. The road provides access to the large new residential neighbourhood to the north of the R122, of which the Ladywell development lands (including the site) are a part. The road has a distinctly urban treatment. It comprises two traffic lanes, green verges with tree lines and segregated pedestrian and cycle paths on both sides.
- **The C Ring Road** is a planned road which is to be built along the site's west boundary (and a stretch of the L1130). It will form part of the Balbriggan Ring Road, which is partly completed, to the south of the R122.

Figure 10.6: Aerial photo showing the site's key landscape/townscape features

10.5.2.5 Pre-existing Houses

There are a small number of houses in the area, which pre-existed the recent urban expansion. One of these is on the south side of the Clonard Road, across the road from the site ('House 1' on Figure 10.5). Another is on the south side of the L1130, just west of its junction with the Clonard Road ('House 2' on Figure 10.5). This house is part of a cluster of farm buildings. The third is a large house on the north side of the L1130, between the two parts of the subject site ('House 3' on Figure 10.5). This property also operates as a creche. There is a disused house ('House 4') on a property neighbouring the creche, also in the area between the two parts of the site. This plot is densely wooded/overgrown.

These residential properties are key potential receptors of change on the site. Residential receptors are generally of high sensitivity to landscape/townscape and visual change. However, in this case it must be recognised that they are all located within a large area zoned for residential development and undergoing a process of profound change. This must be considered when classifying their sensitivity to change.

10.5.2.6 Schools and Residential Neighbourhood North of Site

To the north east of the eastern part of the site, across Taylor Hill Boulevard, are two schools, Coláiste Ghlór na Mara and St George's National School. St George's is well removed from the site, beyond a parking area and a field. In contrast, Coláiste Ghlór na Mara is positioned facing the site across Taylor Hill Boulevard. The people arriving and departing from the school are a key cohort of potential receptors of change on the site. This includes people arriving to the school via the Clonard Brook greenway, which terminates (currently) at the road opposite the site.

To the west of Coláiste Ghlór na Mara, on the north side of Taylor Hill Boulevard, is a new residential neighbourhood ('Taylor Hill'). The nearest houses (at the corner of Taylor Hill Way) are somewhat removed from the site and buffered from it by the Ladywell Phase 3 developments currently under construction. Like the school, the residents of this neighbourhood would have views of the proposed development as they pass along Taylor Hill Boulevard. They are however not sensitive to change of the type proposed, which would complement and complete their own neighbourhood.

The above receptors are the focus of the assessment of townscape and visual impacts in Section 10.7 of this chapter. The assessment also takes account of the following relevant policy in the FDP 2023.

Figure 10.7: The vegetation along the Clonard Brook in the south eastern part of the site

Figure 10.8: The tree line along the site's south east boundary, along the R122/Clonard Road

Figure 10.9: The site frontage to Taylor Hill Boulevard, opposite Coláiste Ghlór na Mara

Figure 10.10: Three large trees on the site, near Taylor Hill Boulevard, opposite Coláiste Ghlór na Mara. These trees are valuable landscape/green infrastructure assets

10.5.3 SURROUNDING LANDSCAPE/TOWNSCAPE – POTENTIAL RECEPTORS OF CHANGE

10.5.4 RELEVANT PLANNING POLICY - FINGAL DEVELOPMENT PLAN 2023-2029

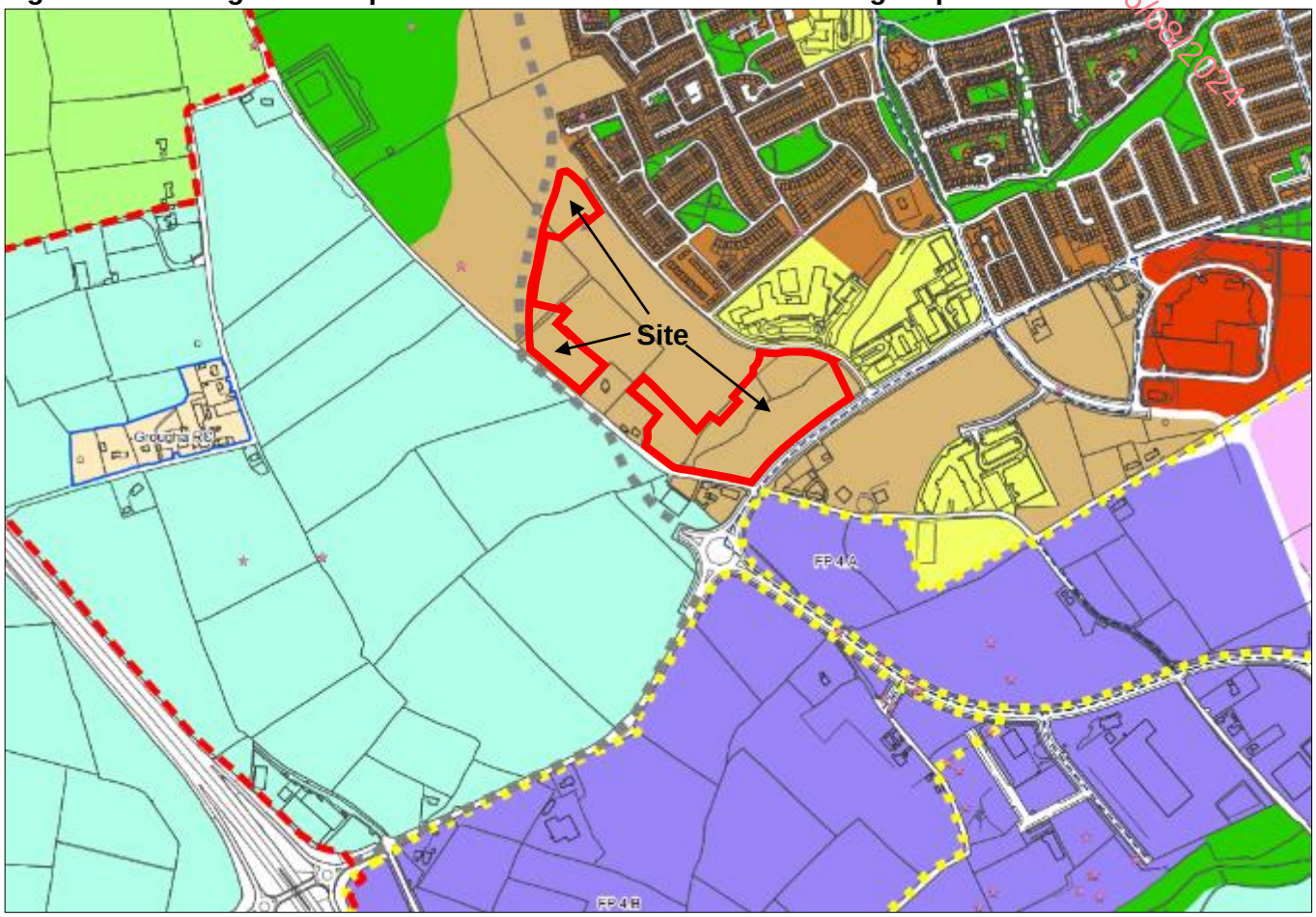
10.5.4.1 Land Use Zoning

The site is zoned RA 'Residential Area'. Other notable aspects of the land use zoning map below include:

- The important role of the R122/Clonard Road as the main approach to Balbriggan from the M1.
- The alignment of the future 'C Link' Road along a part of the L1130 and along the west boundary of the subject site. This will have the effect of containing the site within the urban area.
- The residential zoning of the lands across the R122 to the south east of the site. There is currently one house ('House 1') along the road opposite the site. It can be expected that the lands around this house will be developed for residential use.
- The CI 'Community Infrastructure' zoned lands (yellow - the two schools) across Taylor Hill Boulevard from the site, in addition to other CI zoned lands in the vicinity.
- The large area of GE 'General Employment' zoning (purple) to the south and south east of the site.
- The area of MC 'Major Town Centre' zoning (red) to the east of the site along the R122. This is an existing shopping centre – within walking distance from the site.
- The large area of OS 'Open Space' zoning to the north west of the site along the L1130, also within walking distance from the site.
- The area of RU 'Rural' zoned land to the south west of the site across the L1130. The L1130 marks the boundary of the Balbriggan urban area, giving the site an important role as part of the urban edge.

The combination of schools, retail, employment and open space zoning all in close proximity to the site, in addition to its favourable location with respect to the M1, Balbriggan town centre and the railway station, make the site a good candidate for residential development. The site's development also has an important role to play in defining the new/future urban edge along key roads serving the town.

Figure 10.11: Fingal Development Plan 2023-2029 land use zoning map



10.5.4.2 Policy on Residential Development and Urban Design

Policy SPQHP35 – Quality of Residential Development
"Promote a high quality of design and layout in new residential developments at appropriate densities across Fingal, ensuring high-quality living environments for all residents in terms of the standard of individual dwelling units and the overall layout and appearance of developments. Residential developments must accord with the standards set out in the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG 2009 and the accompanying Urban Design Manual – A Best Practice Guide and the Sustainable Urban Housing; Design Standards for New Apartments (DHLGH as updated 2020) and the policies and objectives contained within the Urban Development and Building Heights Guidelines (December, 2018). Developments should be consistent with standards outlined in Chapter 14 Development Management Standards."

10.5.4.3 Policy on Trees, Hedgerows, Green Infrastructure and Watercourses

Objective CSO54 – Tree-Lined Approach
"Retain existing tree-lined approaches to all towns and villages in order to preserve their special character."

Objective CIOSO52 – Trees
"Protect, preserve and ensure the effective management of trees and groups of trees."

Policy GINHP21 – Protection of Trees and Hedgerows
"Protect existing woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their protection and management in line with the adopted Forest of Fingal-A Tree Strategy for Fingal."

Objective DMSO128 – Demarcation of Townland Boundaries
"Ensure trees, hedgerows and other features which demarcate townland boundaries are preserved and incorporated where appropriate into the design of developments."

Policy GINHP22 – Tree Planting
"Provide for appropriate protection of trees and hedgerows, recognising their value to our natural heritage, biodiversity and climate action and encourage tree planting in appropriate locations."

Objective DMSO125 – Management of Trees and Hedgerows
"Protect, preserve and ensure the effective management of trees and groups of trees and hedgerows."

Objective DMSO126 – Protection of Trees and Hedgerows during Development
"Ensure during the course of development, trees and hedgerows that are conditioned for retention are fully protected in accordance with BS5837 2012 Trees in relation to the Design, Demolition and Construction – Recommendations or as may be updated and are monitored by the appointed arboriculture consultant."

Objective DMSO127 – Use of Native Species in New Developments
"Require the use of native species where appropriate in new developments in consultation with the Council."

Objective DMSO134 – Site Summary of Specimen Removal, Retention and Planting
"Regardless of development size or type, applicants must submit an overall site summary quantifying and detailing the following:
- *tree and hedgerow removal;*
- *tree and hedgerow retention; and*
- *new tree and hedgerow planting.*

This information will be submitted in a digital format agreed with the Council to allow amalgamation and reporting on tree and hedgerow cover within the County over time."

Objective DMSO140 – Protection of Existing Landscape
"Protect existing landscape features such as scrub, woodland, large trees, hedgerows, meadows, ponds and wetlands which are of biodiversity or amenity value and/or contribute to landscape character and ensure that proper provision is made for their protection and management."

10.5.4.4 Policy on Rivers
Objective GINHO41 – Protection of Rivers
"Protect rivers, streams and other watercourses and maintain them in an open state capable of providing suitable habitat for fauna and flora, including fish."

10.5.4.5 Policy on Green Infrastructure
Objective DMSO153 – Green Corridors
"Provide green corridors in all new developments where the opportunity exists."

Objective GINHO12 – Green Infrastructure Requirements
"Ensure the provision of new green infrastructure addresses the requirements of functional flood storage, the sustainable management of coastal erosion, and links with provision for biodiversity, Sustainable Drainage Systems (SuDS) and provision for parks and open space wherever possible and appropriate."

Policy GINHP10 – Green Infrastructure and Development

"Seek a net gain in green infrastructure through the protection and enhancement of existing assets, through the provision of new green infrastructure as an integral part of the planning process, and by taking forward priority projects including those indicated on the Development Plan Green Infrastructure maps during the lifetime of the Development Plan."

Objective GINHO19 – Green Networks
"Create an integrated and coherent green infrastructure for the County by requiring the retention of substantial networks of green space in urban, urban fringe and adjacent countryside areas to serve the needs of communities now and in the future including the need to adapt to and mitigate climate change."

Objective GINHO20 – Green Infrastructure and Recreation
"Where new residential development is proposed, seek, where appropriate to maximise the use and potential of existing parks, open spaces and recreational provision, by upgrading and improving the play and recreational capacity of these existing facilities through development contributions in lieu of new open space or play provision."

Objective GINHO21 – Integration of Green Infrastructure
"Avoid the fragmentation of green spaces in site design and to link green spaces /greening elements to existing adjacent green infrastructure / the public realm where feasible and to provide for ecological functions."

10.5.4.6 Landscape Character

The FDP includes a Landscape Character Assessment, which divides the Fingal landscape into six character types. The site falls into the 'Coastal Type' (see Figure 10.12 below), which is classified as being of High Sensitivity.

Figure 10.12: FDP 2023 landscape character types and value and sensitivity classifications

Landscape Character Types	Landscape Value	Landscape Sensitivity
Rolling Hills Type	Modest	Medium
High Lying Type	High	High
Low Lying Type	Modest	Low
Estuary Type	Exceptional	High
Coastal Type	Exceptional	High
River Valley and Canal Type	High	High

The FDP states:

"Coastal Character Type is categorised as having an exceptional landscape value. The type forms the eastern boundary of the County and contains a number of important beaches, islands and headlands that together create a landscape of high amenity and landscape value. A number of important settlements are located within this area, including Balbriggan, Skerries, Rush, Malahide, Portmarnock and Howth. The land is generally low lying, with the exception of some prominent headlands and hills in the northern part of the area, Howth and the offshore islands. Most of the Howth peninsula is covered by the 1999 Special Amenity Area Order (SAAO)…

The Coastal Character Type is categorised as having an exceptional landscape value. This value is arrived at due to the combination of visual, ecological, recreational and historical attributes. The area has magnificent views out to sea, to the islands and to the Mourne and Wicklow mountains and contains numerous beaches and harbours. The area's importance is highlighted by the High Amenity zoning

covering substantial parts of the area. The area is rich in archaeological, architectural and natural heritage and is of high ecological value."

While the Coastal landscape is classified as highly sensitive, it must be recognised that many of Fingal's towns (including Balbriggan) fall into the area. The coastal area thus includes diverse urban landscapes. The sensitivity classification cannot be intended to prevent urban development, but rather to ensure it is of suitable design quality. This means responding to the local character and retaining valued landscape features and characteristics, as indicated by the following policy objectives.

Policy GINHP25 – Preservation of Landscape Types
"Ensure the preservation of the uniqueness of a landscape character type by having regard to the character, value and sensitivity of a landscape when determining a planning application."

Objective GINHO56 – Visual Impact Assessments
"Require any necessary assessments, including visual impact assessments, to be prepared prior to approving development in highly sensitive areas."

Objective GINHO57 – Development and Landscape
"Ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types, including the retention of important features or characteristics, taking into account the various elements which contribute to their distinctiveness such as geology and landform, habitats, scenic quality, settlement pattern, historic heritage, local vernacular heritage, land-use and tranquillity."

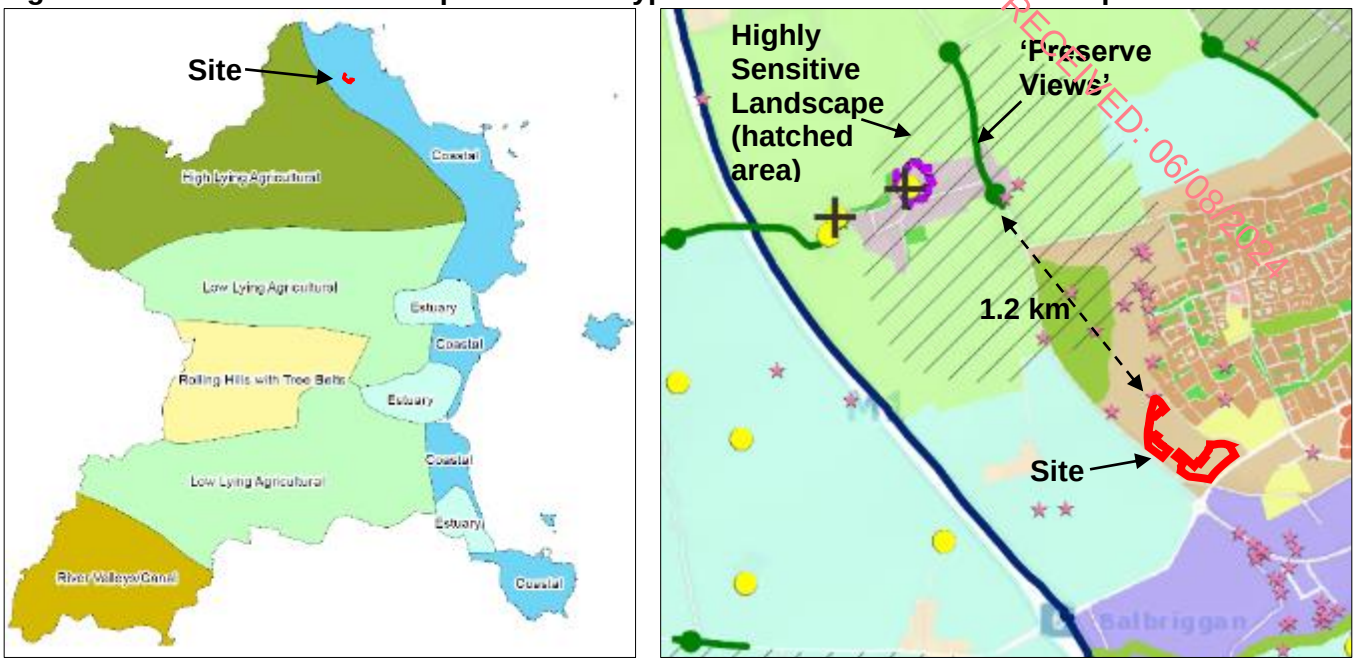
Objective GINHO59 – Development and Sensitive Areas
"Ensure that new development does not impinge in any significant way on the character, integrity and distinctiveness of highly sensitive areas and does not detract from the scenic value of the area.

New development in highly sensitive areas shall not be permitted if it:

- *Causes unacceptable visual harm.*
- *Introduces incongruous landscape elements.*
- *Causes the disturbance or loss of (i) landscape elements that contribute to local distinctiveness, (ii) historic elements that contribute significantly to landscape character and quality such as field or road patterns, (iii) vegetation which is a characteristic of that landscape type and (iv) the visual condition of landscape elements."*

In addition to the landscape character type classifications, the FDP Green Infrastructure maps indicate additional 'Highly Sensitive Landscape' areas. The site does not fall into such an area, but there is an area of Highly Sensitive Landscape a short distance to the north of the site, in the Balscadden/Flemingtown area.

Figure 10.13: FDP 2023 landscape character types and Green Infrastructure map 1



10.5.4.7 Views and Prospects

The FDP 2023 identifies views requiring '*preservation*', with the views indicated by green lines with dots on the Green Infrastructure maps (see Figure 10.12). There are no 'Preserve Views' designations in close proximity to the site. The nearest is the local road north of Balscadden/Flemingtown, over 1km from the site. This elevated stretch of road provides panoramic views east towards the coast. It is the coastal view (as opposed to the view south towards the expanding suburban area of Balbriggan) that the designation seeks to protect/preserve. The site is not visible from the designated stretch of the road.

Objective GINHO60 – Protection of Views and Prospects
"Protect views and prospects that contribute to the character of the landscape, particularly those identified in the Development Plan, from inappropriate development."

Objective GINHO61 – Landscape/Visual Assessment
"Require a Landscape/Visual Assessment to accompany all planning applications for significant proposals that are likely to affect views and prospects."

10.6 POTENTIAL IMPACT OF PROPOSED DEVELOPMENT - VISUAL IMPACT

10.6.1 CONSTRUCTION PHASE IMPACTS

Over the course of the estimated 48 month construction period, the immediate environs of the site would be visually exposed to various construction activities, including the erection of site hoarding, site clearance and levelling, haulage and storage of materials, general construction activity and the incremental growth of the buildings on site. The magniture of change would typically be medium-high in the immediate environs (including the neighbouring/nearby houses and the users of the roads passing by the site – see Figure 10.5 above), reducing with distance from the site.

Residential receptors are generally of high sensitivity to landscape/visual change, while road users in urban areas are not. In this case, it is a factor that the site/proposed development is part of a plan-led urban expansion. Similar change (construction of a residential neighbourhood) has recently taken place and continues to take place in the area, and as a result there is tolerance for further similar change. Without construction taking place on the site, the neighbourhood would be visibly incomplete.

Nonetheless, until the buildings are fully clad, the landscape/public realm completed and the site hoarding removed, the visual impact would be negative. The impact would however be temporary.

10.6.2 SELECTION OF VIEWPOINTS FOR VISUAL IMPACT ASSESSMENT

Eight viewpoints were selected for visual impact assessment informed by verified photomontages (see Figure 10.13 below). The selection of the views took account of the survey and analysis of the site and surrounding landscape (see Sections 10.5.2 and 10.5.3) and review of relevant policy (Section 10.5.4).

Figure 10.14: Viewpoints for visual impact assessment

The viewpoints were chosen to allow for assessment of the proposal's interface with the surrounding roads and neighbouring developments (planned and existing), its impact on pre-existing houses in the area and its treatment of the site's existing landscape assets.

It was deemed that visibility of the development from the wider environs could not constitute 'significant' visual impact (the purpose of EIA is to identify significant impacts), since (a) the site is zoned for residential development and falls within the urban boundary, (b) it is adjacent to similar existing and permitted

developments, and (c) the proposal does not include any buildings substantially taller than the existing and permitted developments in the area. There is thus no potential for the development to stand out from its context in views from a distance. The visual impact assessment therefore focuses on the proposal's appearance in views from close-up.

The selected viewpoints address/represent the following receptors:

Viewpoint 1 – The R122/Clonard Road approaching the site (and Balbriggan) from the M1. This is a key view of the planned/future urban edge, experienced by a large number of people entering the town.

Viewpoint 2 – A view representing the house across the R122/Clonard Road from the site ('House 1', Figure 10.5), showing how the proposed development addresses the road, and the impact on the roadside tree line.

Viewpoint 3 – The view from Taylor Hill Boulevard (to the east), showing the proposed built frontage to the road, and whether a green infrastructure connection will be made across the road, along the Clonard Brook.

Viewpoint 4 – The view from Taylor Hill Boulevard, showing the proposed development's relationship with the neighbouring permitted Phase 3 development, and the impact on the site's most valuable specimen trees.

Viewpoint 5 – The view from Taylor Hill Gardens where it interfaces with the site across Taylor Hill Boulevard, showing the proposed apartment building in relation to the existing houses across the street.

Viewpoint 6 – A view representing the farmhouse on the L1130 ('House 2', Figure 10.5), also showing the proposed site entrance and green infrastructure corridor.

Viewpoint 7 – A view showing the site frontage to the L1130 road and the proposed development's relationship with the neighbouring house/creche ('House 3', Figure 10.5).

Viewpoint 8 – A view from the L1130, showing the proposed development's frontage to the future 'C Ring' Road.

The potential impacts on these views are individually assessed below. The assessments should be read in conjunction with the photomontages provided in Appendix G, Volume III of the EIAR, and also as a standalone document.

10.6.3 OPERATION PHASE IMPACTS

10.6.3.1 Viewpoint 1 - R122/Clonard Road approaching the site (and Balbriggan) from the M1

10.6.3.1.1 Existing View

- The Clonard Road provides the most direct route between Balbriggan town centre and the M1. The road is thus an important element of the urban structure. This is reflected in the road's specification (note the segregated cycle lanes and wide green verges – a treatment of 'urban thoroughfare' character), but there is a notable absence of built frontage/enclosure to the road.
- The view is taken from the road as it enters the urban area, approaching from the M1. The view is thus a gateway view.
- The junction of the L1130 is in the foreground, and beyond that, to the left of the Clonard Road, is the site. There is a hedgerow/tree line along the site's roadside boundary, and new housing development (in the distance beyond the site) can be seen through the trees.
- Although the boundary trees do provide some visual amenity, there is a degree of incongruity between (a) the urban treatment of the road corridor and (b) the character and condition of the adjacent lands - specifically the absence of built frontage at this gateway location.
- Viewpoint sensitivity: Medium. There is capacity for change in the view, but any proposed change should be informed by the gateway status of the view.

10.6.3.1.2 Proposed View

- The character of the Clonard Road corridor is transformed by the development, with (a) the existing roadside tree line removed, and (b) terraces of three storey duplexes and houses positioned inside the boundary, with the specific purpose of addressing the road and providing built frontage/enclosure.
- The terraces face the road but are accessed from within the site, to their rear. This allows the buildings to provide the desired urban-type street frontage without a requirement for vehicular access/entrances from the road – although pedestrian entrances are provided for permeability.
- In addition to there being a variety of building/house types along the Clonard Road (duplexes and houses), each terrace is articulated – by recessed and projecting elements, steps in the roofline, and variations in material. High quality brick cladding is used throughout the ground floors (at the interface with the street/public realm for maximum effect), and to emphasise vertical design features such as projecting bays/balconies.
- A row of tightly spaced street trees is proposed in the wide green verge in front of the buildings. This is a deliberately formal, urban green infrastructure feature, to replace the existing hedgerow/tree line which is a feautre of rural character. In time the new trees will mature to soften the built frontage, but not entirely screen the buildings.

- A notable feature of the duplex terrace in the foreground is its turning of the corner (by the ground floor brick façade and windows) to face the L1130. Another terrace of houses within the site, to the rear of the duplex terrace fronting the Clonard Road, subtly addresses the L1130, thereby strenthening the urban structure.
- Magnitude of change: Medium-High.

10.6.3.1.3 Impact Significance

- Significant positive: The development transforms the character of the Clonard Road at this important place in the evolving townscape, where this key thoroughfare enters the urban area. The buildings are of sufficient stature to provide urban-type enclosure to the street, sufficient variety to provide visual interest (and avoid monotony), and sufficient design and material quality to raise the overall quality of the townscape at this important gateway location.

10.6.3.2 Viewpoint 2 – Entrance to house across the R122/Clonard Road from the site

10.6.3.2.1 Existing View

- This view is taken from a short distance further along the Clonard Road towards Balbriggan town centre, at the entrance to a residential property across the road from the site ('House 1' on Figure 10.5 above).
- The view is similar to that at Viewpoint 1. The wide road corridor occupies much of the view, with green verges and segregated cycle and pedestrian paths both sides of the vehicular carriageway. This is a distinctly urban street specification, but there is a notable absence of built frontage/enclosure to the road.
- On the far side of the road is the hedgerow/tree line along the site boundary. Although the vegetation does provide visual amenity there is a degree of incongruity between the road corridor and the adjacent lands – particularly at this location within the urban area.
- In the distance along the road, a school and residential buildings can be seen.
- Viewpoint sensitivity: Medium. The viewpoint represents a house (usually clasified highly sensitive), but the house is located alongside a key urban thoroughfare and forms part of a large block of RA zoned lands currently in agricultural use. This lessens the sensitivity to change of the type proposed.

10.6.3.2.2 Proposed View

- The existing hedgerow/tree line on the site boundary is removed, and terraces of houses and duplexes are positioned inside the boundary, with the specific objective of addressing the road and providing built frontage/enclosure.
- The terraces face the road but are accessed from within the site. This allows the buildings to provide urban street frontage without a requirement for vehicular access/entrances from the road – although pedestrian entrances are provided for permeability.
- From this proximity the houses' doors are visible, making the frontage active and contributing further to the urbanisation of the Clonard Road streetscape.
- In addition to the variety of building/house types, each terrace is articulated – by recessed and projecting elements, steps in the roofline and variations in material. In this view, the nearest house presents its gable end to the street, while the ridge of the neighbouring duplex terrace is parallel to the road – creating variety in the street elevation.
- Brick cladding is used throughout the ground floors, and to emphasise design features such as projecting bays/balconies.
- A row of street trees in a bed of ornamanetal planting is proposed in the wide verge in front of the buildings. This is a formal, urban green infrastructure feature, to replace the existing hedgerow/tree line which is of rural character. In time the new trees will mature to soften the built frontage, but not entirely screen the buildings.
- Magnitude of change: Medium-High.

10.6.3.2.3 Impact Significance

- Significant positive: The buildings provide definition and active frontage to the street, without excessive enclosure (from the perspective of the house across the road). The variety in the street elevation provides visual interest, and the buildings and landscaping are of appreciably high design and material quality, so that the overall effect of the development is to (a) reinforce the evolving landscape/townscape character and (b) improve its quality and visual amenity.

10.6.3.3 Viewpoint 3 – Taylor Hill Boulevard approaching site from the Clonard Road to the south east

10.6.3.3.1 Existing View

- The view is from Taylor Hill Boulevard just after turning off the Clonard Road into the new neighbourhood of Taylor Hill.
- To the right of the street as it curves up the hill are (a) the entrance/exit (through a wall) to a greenway along the Clonard Brook, and (b) the distinctive Coláiste Ghlór na Mara school building, also behind a roadside wall.
- Like the Clonard Road, Taylor Hill Boulevard has an urban streetscape treatment, with wide, segregated pedestrian and cycle paths both sides of the road.
- A timber fence on the far side of the road hides the ground level of the site from view, but the vegetation along the Clonard Brook (in the foreground to the left) and a number of mature trees in the middle distance rise above the fence.
- In the distance up the road, a development under construction can be seen on the lands neighbouring the site.
- Viewpoint sensitivity: Low-Medium. The viewpoint represents road users entering a neighbourhood under construction. There is capacity for change; in fact the landscape could benefit from consolidation of the emerging urban character. However, there are also valuable landscape features on the site that should be retained if possible.

10.6.3.3.2 Proposed View

- In the foreground to the left, a greenway can be seen entering the site alongisde the Clonard Brook, opposite the existing greenway along the brook to the east of the road.
- Further up the road a three storey, red brick duplex terrace is positioned fronting the street opposite the school. The building complements the school in enclosing the street and strenghtening the emerging urban character.
- Further buildings can be seen within the site, but the vegetation along the Clonard Brook is retained and this remains a key feature of the new neighbourhood.
- Magnitude of change: Medium.

10.6.3.3.3 Impact Significance

- Moderate positive: The development introduces a building of appreciably high quality to Taylor Hill Boulevard, strenghtening its character as an urban street and improving the overall quality of the built environent. Importantly, the valuable landscape features on the site, i.e. Clonard Brook, the vegetation on its banks and the mature trees within the site, are retained and given emphasis in the landscape, enhancing visual amenity.

10.6.3.3.4 Cumulative Impact

- The cumulative view shows the permitted development further up Taylor Hill Boulevard beyond the subject site. Although the neighbouring development is relatively inconspicuous (being further from the

viewer), it provides favourable context for the proposed development, combining with it to comple the street elevation.

- The cumulative magnitude of change is medium, and the significance of the impact is moderate positive.

10.6.3.4 Viewpoint 4 – Taylor Hill Boulevard approaching site from the north

10.6.3.4.1 Existing View

- The view is from Taylor Hill Boulevard outside Coláiste Ghlór na Mara. (The school building is set back behind the wall to the left.)
- In the foreground to the right of the road is the site of the permitted development Reg. Ref. F21A/0055, currently under construction (on land abutting the subject site).
- The key features of the view are three mature trees growing in a hedgferow on the site. The trees are large, with well-shaped crowns and dominate their local landscape context.
- Also of note in the view is the rising topography behind the site (beyond the Clonard Road), and a large new school building positioned on the ridgeline.
- Viewpoint sensitivity: Low-Medium. The viewpoint represents road users in a neighbourhood under construction. There is capacity for change and in fact the landscape could benefit from development that consolidates the emerging urban character. However, there are also valuable landscape features on the site (the trees) that should be retained if possible.

10.6.3.4.2 Proposed View

- The three trees are retained in a sizeable new park in the near corner of the site, alongside the new road entrance to the lands west of Taylor Hill Boulevard, opposite the school. The park includes a playground beneath the retained trees, and a permiter of ornamantal planting and additional new trees.
- Beyond the park is a three storey, red brick duplex terrace, fronting Taylor Hill Boulevard opposite the entrance to the school. The building provides enclosure and active frontage to the street, strenthening its urban character.
- Beind the park and the roadside duplex block, further housing can be seen through the abundant vegetation (retained and new).
- Magnitude of change: Medium.

10.6.3.4.3 Impact Significance

- Moderate positive: The development (a) retaines the trees, (b) introduces a new public open space co-located with the school across the street, and (c) introduces a building of appreciably high quality to Taylor Hill Boulevard, strenghtening its character as an urban street, improving passive surveillance and improving the overall quality of the built environent.

10.6.3.4.4 Cumulative Impact

- The cumulative view shows the permitted development Reg. Ref. F21A/0055 in the foreground. The two developments combine to form a street elevation of modest scale (up to three storerys), high quality (with red brick the predominant material) and active frontage, transforming the character of the street and this particular view. The new buildings serve to frame, and therefore emphasise, the public open space – and the retained trees - at the entrance to the new neighbourhood.
- The cumulative magnitude of change is high, and the significance of the impact is significant positive.

10.6.3.5 Viewpoint 5 – Taylor Hill Gardens

10.6.3.5.1 Existing View

- The view is from a green verge at the cul-de-sac in Taylor Hill Gardens. The viewpoint represents the residents of this part of Taylor Hill, which is completed and occupied. The footpath in the foreground leads to the completed stretch of Taylor Hill Boulevard, giving access to the school a short distance down the road.
- To the left is a terrace of houses positioned to provide set-back frontage to Taylor Hill Boulevard (opposite the site), although the stretch of the road in front of the houses is yet to be completed.
- To the right of the future road corridor, a development under construction (Reg. Ref. F22A/0670) can be seen on lands adjoining the subject site, partially screened by a temporary boundary fence. The fence also hides a construction depot.
- The land rises to the west (right) and a hedgerow runs along the ridgeline, enclosing the view.
- Viewpoint sensitivity: Medium. The viewpoint represents local residents. Residential recweptors are generally sensitive to change. However, in this case, the landscape is visibly in a process of transition and would benefit from development that consolidates the emerging urban character. There is thus capacity for change.

10.6.3.5.2 Proposed View

- The village centre is located in the corner of the site, the building orientated to face the existing neighbourhood across the extended Taylor Hill Boulevard. The building is three storeys tall, with retail and café units on the ground floor and apartments on the two floors above. The building is pitch-roofed and red brick in keeping with the character of the neighbourhood, but the commercial use and the building's proportions set it apart, so that it will function as a local landmark adjacent to the junction with the C Ring Road.
- To the left, a terrace of three storey townhouses has strong frontage to Taylor Hill Boulevard, combining with the village centre to form a local core of distinctly urban character.
- To the right up the hill, houses of smaller stature can be seen facing the alignment of the future C Ring Road. There is a visble intensification of land use from those houses to the village centre in the foreground.
- Magnitude of change: Medium-High.

10.6.3.5.3 Impact Significance

- Significant positive: The development combines with the existing houses to the left to enclose a key stretch of Taylor Hill Boulevard as the road approaches its junction with the C Ring Road. The mixed use typology and the stature of the village centre building (along with the generous provision of public realm) strengthens the urban character of the street and the place. The development makes a significant positive contribution to the emerging urban structure and its legibility. The buildings are also of appreciably high design and material quality.

10.6.3.5.4 Cumulative Impact

- The cumulative view shows the permitted development Reg. Ref. F22A/0670 to the left beyond the proposed development. There is – intentionally – a visible step in height and a step in the building line (towards the street) between the permitted and proposed developments. This intensification of use and urban character contributes to a shift in character along Taylor Hill Boulevard towards the local urban/village core, enhancing legibility.
- The cumulative view also shows the massing of the permitted Flemington Lane LRD development (Reg. Ref. LRD0006/S3; Bord Pleanála LH06F.319343) to the right of the C Ring Road. The view shows a row of houses up the road opposite the subject site. There is a four strorey apartment building

directly across the road from the village centre (just outside the frame of view). In combination, the developments transform the view, creating a distinct local urban core.
- The cumulative magnitude of change is high, and the significance of the impact is significant positive.

10.6.3.6 Viewpoint 6 – L1130 at 'House 2' (see Figure 10.5)

10.6.3.6.1 Existing View

- The view is from the local road that passes along the southern site boundary. The viewpoint represents road users and a single farmhouse across the road from the site (see Figure 10.5). The viewpoint is a short distance off the Clonard Road. The farm (including House 2) is zoned for residential development (see Figure 10.10).
- Across the narrow road is a hedgerow that marks the site boundary and screens the site from view.
- To the left, in the middle distance, is the rural landscape outside the settlement boundary. The C Ring Road will pass through the field in view.
- Viewpoint sensitivity: Medium. The viewpoint represents a house (usually clasified highly sensitive), but the farmhouse and associated lands are zoned for residential development, as is the site across the road, and both parcels of land fall within the settlement boundary contained by the future C Ring Road. This lessens the viewpoint sensitivity to change of the type proposed.

10.6.3.6.2 Proposed View

- The hedgerow across the road is removed. Across the road from the house is a large triangle of open space containing a parkland area, the Clonard Brook corridor (the brook passes beneath the road in a culvert) and a playground.
- The nearest houses can be seen to the left facing the stream corridor. As elsewhere in the development, the houses are 2-3 storeys with pitched roofs. The ground floors are clad in red brick and the upper floors in white render.
- A notable change to the road is the additioon of a cycle lane and footpath segregated from the road by a kerb.
- Magnitude of change: Medium-High.

10.6.3.6.3 Impact Significance

- Moderate positive: The landscape in view is transformed, from rural (but visually enclosed), to urban/suburban but characterised by an abundance of open space, vegetation and a stream. The houses and road improvements contruibute to the change in character but are secondary to the open space elements in the view. The resulting view is of high visual a menity value for the urban location.

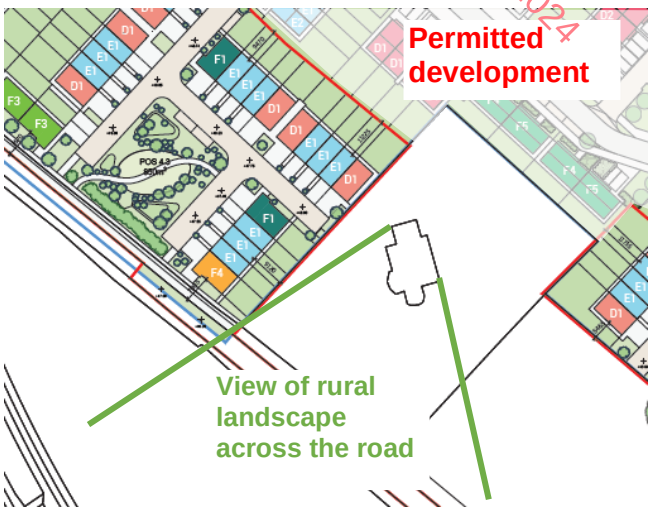
10.6.3.7 Viewpoint 7 – L1130 at 'House 3' (see Figure 10.5)

10.6.3.7.1 Existing View

- The local road climbs steeply along this stretch and to the right is a large house set well back from the road on an extensive plot. In addition to its residential use, the property operates as a creche.
- There is a tall, dense hedge along the property's northern boundary that it shares with the subject site. Behind this hedge, a large earth stockpile can be seen on the site and there is a ditch along the roadside.
- To the left of the road is a landscape of undulating fields, zoned 'Rural'. The house (House 3) in view orienatates towards this rural landscape to the west of the road.
- It should be noted the stretch of the local road in view (i.e. passing by the house) is planned to be upgraded to form part of the C Ring Road (see Figures 10.5 and 10.10 above).
- Viewpoint sensitivity: Medium. The viewpoint represents a house (usually clasified highly sensitive), and the house enjoys a high level of visual amenity due to its *historic* location outside the urban area

in a mainly rural landscape. However, it is also a factor that the house operates as a business (creche) which is dependent on the nearby urban population for business. Additionally, the house is part of a large block of land (including the site) zoned for residential development within the settlement boundary of Balbriggan, and development on the surrounding lands has already begun. This lessens the viewpoint sensitivity to change of the type proposed.

10.6.3.7.2 Proposed View



- Two terraces of houses are positioned inside the boundary shared with House 3, one perpendicular and one parallel to the boundary. The houses are two storeys, except for the end of terrace house at the roadside, which steps up to three storeys. This is intended as a local landmark at the urban edge. The feature house is clad in brick to strenghten its local landmark status.
- The houses are partly screened by the retained hedge on the boundary, but due to the rising topography they are nonetheless prominent additions to the view (from the road and from the house and gardens of House 3).
- Further up the road is a terrace of two storey houses fronting the road, combining with the three storey house to mark the urban edge. Between these buildings is a local park with a belt of vegetation along the roadside.
- Magnitude of change: Medium-High.

10.6.3.7.3 Impact Significance

- Moderate neutral: The landsacape context and views from House 3 are transformed by the house's absorption into the expanded residential neighbourhood, with House 3 becoming part of that neighbourhood at the urban edge. While enclosed by new development to the north (and east where development is already permitted and construction underway), the view of the rural landscape across the road is retained (and framed by the new buildings). The landscape context is significantly altered, but House 3 retains an enviable level of residential and visual amenity – due to the size of the house and its grounds, and the retension of the view to the west/south west.

10.6.3.7.4 Cumulative Impact

- The cumulative view shows the permitted development Reg. Ref. F22A/0670 to the right, behind the proposed development and House 3. This slightly increases the urbanisation/suburbanisation of the house's context landscape.
- The cumulative magnitude of change remains medium-high, and the significance of the impact moderate neutral.

10.6.3.8 Viewpoint 8 – L1130 approaching the site from the north

10.6.3.8.1 Existing View

- This is the view from the opposite angle to View 7. The L1130 descends a steep slope and in the middle distance House 3 can be seen to the left of the road.
- Behind the scrubby hedgerow in the foreground to the left, earth stockpiles can be seen on the subject site. The roofs of the houses of Taylor Hill are visible through gaps in the hedgerow.
- To the right of the road is a landscape of undulating fields, zoned 'Rural'.
- Ahead in the distance is the peri-urban landscape of Fingal, in which a variety of development types (including housing estates and industry) can be seen interspersed with agricultural fields.
- Viewpoint sensitivity: Low-Medium. The viewpoint represents the users of the L1130 local road as it passes by an area visibly in a state of transition from peri-urban to urban/suburban. This is a plan-led change. While the open space and vegetation generate some visual amenity, the landscape could benefit from consolidation of the emerging urban character.

10.6.3.8.2 Proposed View

- Ahead along the L1130, a terrace of two storey houses is positioned fronting the road, and in the middle distance the three storey 'feature house' (beside House 3) is visible. These buiildings establish a distinct urban edge along the L1130, with the rural landscape remaining to the right (south west).
- Two terraces of two storey houses are positioned perpendicular to the roadside terrace, fronting a broad green corridor that emerges from the site at the corner of the future C Ring Road.
- Two existing hedgerows (that currently enclose a farm lane) are retained in this open space.
- The Supplementary Modified Photomontage shows a row of four houses fronting the future C Ring Road to the left. (The supplementary photomontage has been modified by artificially expanding the field of view to the left, to show these houses.) These are three storey, brick clad houses, their type and scale commensurate with the status of the Ring Road in the urban structure.
- Magnitude of change: Medium-High.

10.6.3.8.3 Impact Significance

- Moderate positive: The landscape in view is transformed – or partially transfromed – by the expansion of the residential neighbourhood to the new urban edge along the L1130 and the Ring Road. The houses are positioned to reinforce the new urban structure, and to retain key existing landscape features (the hedgerows) in a strategcially located open space. The development both delineates the urban landscape *and* creates a permeable edge between the neighbourhood to the adjacent rural landscape. The houses are all of high design and material quality, and there is sufficient variety to achieve visual interest and legibility. Overall, this is a highly successful view.

10.6.3.8.4 Cumulative Impact

- The cumulative view shows the permitted development Reg. Ref. F22A/0670 within the site, extending the terraced houses along the green green corridor containing the retained hedgerow.
- The cumulative magnitude of change remains medium-high, and the significance of the impact moderate positive.

10.7 POTENTIAL IMPACT OF PROPOSED DEVELOPMENT - LANDSCAPE IMPACT

10.7.1 LANDSCAPE SENSITIVITY

Informed by the analysis in Section 10.5 above, and consideration of relevant policy, the landscape sensitivity of the receiving environment can be classified 'medium'.

(Definition of medium sensitivity: *Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The landscape character is such that there is some capacity for change. These areas may be recognised in landscape policy at local or county level and the principle management objective may be to consolidate landscape character or facilitate appropriate, necessary change*.)

The classification of medium sensitivity is based on the following factors:

- The site and receiving environment fall into the Coastal Landscape Character Type, which is identified as Highly Sensitive' in the FDP. It must be recognised that many of Fingal's towns (including Balbriggan) fall into the coastal area. The coastal area thus includes diverse (and expanding) urban landscapes. The sensitivity classification cannot be intended to prevent urban development, but rather to ensure it is of suitable design quality. This means responding to the local character and retaining valued landscape features and characteristics.
- The Guidelines for Landscape and Visual Impact Assessment (3rd edition, 2013) states: *"Landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape. In LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning, but it is not the same as it is specific to the particular project or development that is being proposed and to the location in question."*
- The site includes several valued landscape features, most notably the Clonard Brook and associated vegetation, a number of specimen trees (including three large trees across Taylor Hill Boulevard from the neighbouring school), and various hedgerows internal to the site and around the perimeter.
- The site is zoned RA 'Residential Area' and forms part of a large block of similarly zoned land inside the settlement boundary of Balbriggan. (The RA zoning is indicative of the value attached to the landscape, and its susceptibility to change caused by residential development.)
- The urban area has expanded in recent years towards the settlement boundary (and the site), and the site's immediate environs can be described as being in a state of transition towards an urban condition. This change has been plan-led by several cycles of the Fingal Development Plan (see Figure 10.2 above).
- There is development under construction on lands adjacent to the site, giving the landscape a disturbed/ incomplete appearance in places. The landscape could benefit from consolidation of its character.
- The site occupies both an 'urban edge' and a 'gateway' location (with respect to the Clonard Road, which is the main link between Balbriggan and the M1). This demands a considered design approach in order that any development on the land present an elevation of appropriate character and quality.

Therefore, notwithstanding the site's location in the Coastal Landscape Character Area, and its prominent (urban edge and gateway) location, due to its RA zoning and the transitional condition of the receiving environment, for the purpose of this assessment the landscape is classified as being of medium sensitivity (to the type of development proposed).

10.7.2 CONSTRUCTION PHASE IMPACT

10.7.2.1 Magnitude of Landscape Change (Construction Phase)

Over the course of the estimated 48 month construction period, the site and immediate environs would be disturbed by construction activities including the erection of site hoarding, site clearance and levelling, haulage and storage of materials, general construction activity and the incremental growth of buildings on site. The magniture of landscape change would be greatest in the immediate environs (e.g. the adjacent roads and nearby houses), reducing with distance from the site. The change would be temporary. It is also a factor that the receiving environment is undergoing a wider transformation, with certain areas and elements of the neighbourhood recently completed and others under construction. In this context, further, similar construction-related change is not unexpected. In summary, the magnitude of landscape change in the construction phase would be low-medium.

Construction is inherently and unavoidably disturbing of the landscape.

10.7.2.2 Significance and Quality of Landscape Impact (Construction Phase)

Measuring the magnitude of change against the landscape sensitivity (refer to Table 10.3 and Figure 10.1), the significance of the landscape impact during construction would be moderate negative in the immediate environs (the small number of neighbouring houses and the adjacent roads). The significance of the impact would reduce with distance from the site.

10.7.3 OPERATION PHASE IMPACT

10.7.3.1 Magnitude of Landscape Change (Operation Phase)

The landscape of the 7.15 ha site (mostly greenfield, although disturbed in places by construction on adjoining lands) would be permanently transformed by the construction 197 no. new dwellings, a 'village centre' (comprised of a shop and café), ancillary infrastructure and a network of open spaces, forming part of a large new residential neighbourhood at the edge of Balbriggan. The site is prominently located adjacent to the Clonard Road at a gateway into the urban area, and alongside the the future C Ring Road, Taylor Hill Boulevard and a stretch of the L1130 local road. However, the receiving environment is already in the process of change, with three permitted developments (known as Ladywell Phases 3A, 3B and 3C) located on the same parcel of land contained between the Clonard Road, the C Ring Road, Taylor Hill Boulevard and the L1130. The development would therefore *contribute* to an ongoing, large-scale landscape change, as opposed to *causing* such a change itself. Therefore, the magnitude of landscape change in the operation phase of the development can be classified 'medium'.

(Definition of medium magnitude of change: Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.)

(It should be noted that landscape impact assessment is generally concerned with change to the landscape *character* of an area, and is not limited to the change occurring on the site. Therefore, while the site itself may be fundamentally transformed – e.g. from agricultural in use to a new residential estate – it is possible that the magnitude of change at 'the landscape scale' might only be medium. This is the case with the proposed development, which would contribute to an ongoing, wider landscape change.)

10.7.3.2 Significance and Quality of Landscape Impact (Operation Phase)

Measuring the magnitude of change against the landscape sensitivity (refer to Table 10.3 and Figure 10.1), the significance of the landscape impact during operation would be moderate positive.

The classification of the impact quality as positive is based on the following assessment of the proposal against the *relevant* criteria in the Urban Design Manual – A Best Practice Guide (2009). This is in accordance with Policy SPQHP35 – Quality of Residential Development, which states: *"Promote a high quality of design and layout in new residential developments at appropriate densities across Fingal, ensuring high-quality living environments for all residents in terms of the standard of individual dwelling units and the overall layout and appearance of developments. Residential developments must accord with the standards set out in the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG 2009 and the accompanying Urban Design Manual – A Best Practice Guide"*.

The assessment in Table 10.7 below indicates that the proposal complies with the relevant criteria of the Urban Design Manual. The landscape effects can thus be classified positive.

Table 10.6: Assessment of proposal against relevant criteria of the Urban Design Manual – A Best Practice Guide (2009)

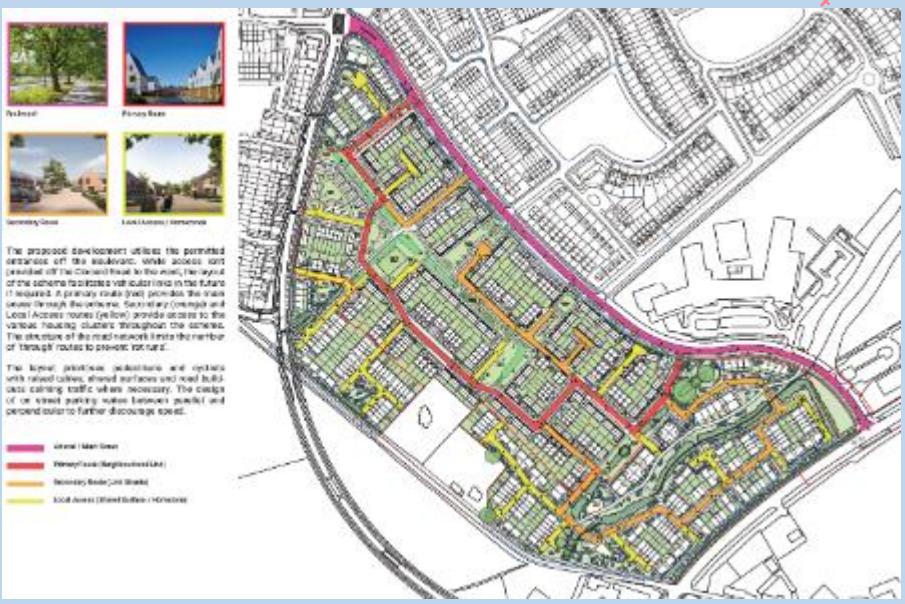
Urban Design Criteria and Indicators		Yes/ No	Comment
01 Context - How does the development respond to its surroundings?			
01a	The development seems to have evolved naturally as part of its surroundings	Yes	The site forms part of a large RA 'Residential Area' zoned block of land contained by the Clonard Road, the future C Ring Road, the L1130 local road and Taylor Hill Boulevard. Planning permission has been granted for three residential developments within this block of land (Reg Refs F21A/0055, F22A/0670 and F22A/0670 – see Figure 10.3 above.) The proposed development would infill the remaining areas in this block of land (apart from two residential properties along the L1130), completing a new residential neighbourhood. The proposal: • Adopts and extends the established urban grain (the pattern of streets, blocks and open spaces) from the neighbouring permitted developments (and from the existing Taylor Hill development to the north east). • Uses the two already permitted vehicular entrances off Taylor Hill Boulevard to provide access. • Combines with the permitted neighbouring developments to jointly enclose/define public open spaces, completing a connected network of green infrastructure across the combined neighbourhood. • Uses (mostly) the same building typologies and adopts a similar architectural character and materials palette to the neighbouring permitted developments. • Combines with the permitted neighbouring developments to complete the street elevations of Taylor Hill Boulevard (see photomontage for Viewpoint 4) and the future C Ring Road. • Provides the local 'village centre' for the combined neighbourhood. In addition, there is an LRD permission located to the north (LRD0006/S3 & ABP Ref: LH06F.319343) granted by the Board on the 4th of July 2024, which comprises 564 no. dwellings in a mix of apartments, houses and commercial units as well as open space. The proposed development would combine with that development to enclose and define the character of a stretch of the C Ring Road. The proposed development thus integrates seamlessly with and would appear to have 'evolved naturally' from its urban context.

Urban Design Criteria and Indicators		Yes/ No	Comment
			 The one exception to the above is along the L1130 to the south west, where the local road marks the planned urban edge of Balbriggan. Here, there is a deliberately abrupt transition between the proposed development and the zoned RU 'Rural' area across the road. Such clear demarcation of the urban area is good urban design; it protects the rural environs from creeping urban development.
01b	Appropriate increases in density respect the form of buildings and landscape around the site's edges and the amenity enjoyed by neighbouring users	Yes	The only higher density typology in the proposed development is a small apartment element in the village centre, located at the junction of Taylor Hill Boulevard and the C Ring Road. This comprises a building with a commercial ground floor (one retail unit and one café unit), with two floors of apartments above. The building is pitch-roofed and red brick in keeping with the character of the neighbourhood, but the commercial use and the building's larger proportions (compared to the neighbouring houses) set it apart, so that it will function as a local landmark (see CGI below).

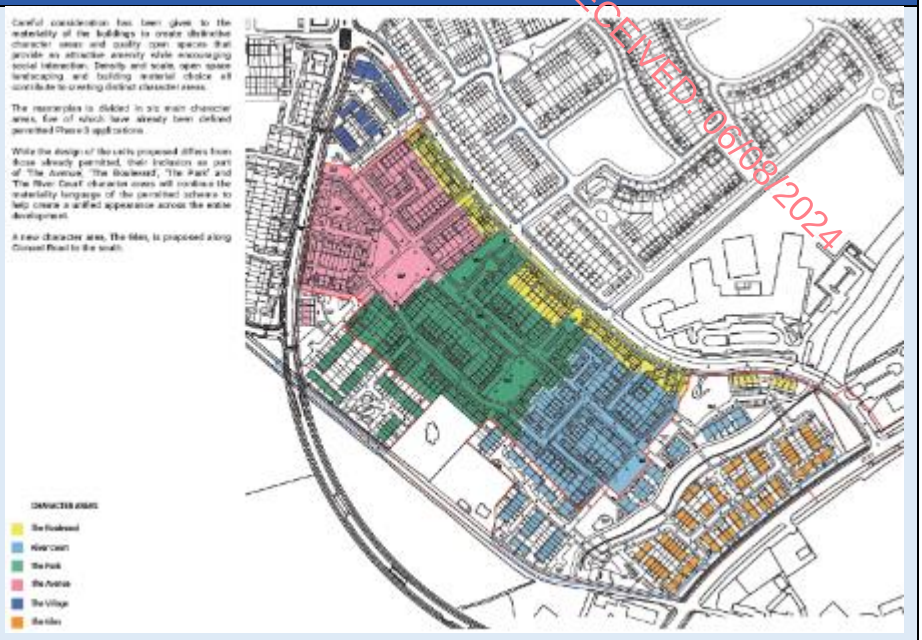
Urban Design Criteria and Indicators		Yes/ No	Comment
			 Additionally, buildings of distinctly urban typology and character, although modest scale (i.e. three storey duplex terraces and three storey townhouses, distinct from the suburban-type terraces elsewhere) are located along key external road frontages, including the Clonard Road, Taylor Hill Boulevard (opposite the school and alongside the village centre) and the C Ring Road. These subtle increases in scale and shifts in character are intended to reinforce the urban structure and character of the new neighbourhood.
01c & d	Form, architecture and landscaping have been informed by the development's place and time The development positively contributes to the character and identity of the neighbourhood	Yes	The typology of the proposed development has been informed by national and local policy reflecting the paradigm of sustainable land use, for example the *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities*, with which the proposed density is compliant. In complying with current residential density policy, the proposal is informed by its place and time. Additionally, the proposal responds to the site topography and key landscape features, thereby reflecting the place and giving distinct character and identity to the neighbourhood. For example, the proposal: • Includes a riparian corridor across the site, along the Clonard Brook, with the vegetation on its banks retained and footpaths provided on both sides, forming a greenway. • Incorporates three existing large specimen trees into a new public open space across Taylor Hill Boulevard from the school. • Incorporates sections of retained hedgerow in other open spaces, notably in a corridor that emerges from the neighbourhood at the corner of the L1130 and the C Ring Road.

Urban Design Criteria and Indicators		Yes/ No	Comment
			 Additionally, the various building typologies are positioned to create variations in character across the neighbourhood, to strengthen the urban structure and character, and improve landscape/townscape legibility. This is notable at the village centre and in the built frontage to Clonard Road, Taylor Hill Boulevard and the C Ring Road.
01e	Appropriate responses are made to the nature of specific boundary conditions	Yes	The building typologies and design demonstrably respond to the specific character and conditions on all four sides of the site: • **Clonard Road**. The existing hedgerow/tree line along the Clonard Road is removed to allow a built frontage of distinctly urban character to be introduced to this important thoroughfare (the main road link between Balbriggan town centre and the M1) at the road's entrance (or gateway) to the urban area. 3-storey duplex terraces are used to achieve this. However, at the centre of the site frontage to the road, opposite an existing house across the road ('House 1') there is a more permeable terrace of 2-3 storey houses.  • **Taylor Hill Boulevard**. Two 3-storey duplex terraces are positioned on Taylor Hill Boulevard opposite the neighbouring school. 3-storey houses are positioned at the other end of the street approaching the village centre, and the mixed-use village centre building identifies the local/ neighbourhood core. These building typologies, and their positioning close to the street, are intended to give Taylor Hill Boulevard an urban streetscape character.

Urban Design Criteria and Indicators		Yes/ No	Comment
			• **C Ring Road**. A terrace of four 3-storey, red brick townhouses is proposed along the C Ring Road. The character and stature of the buildings is commensurate with the status of the future urban thoroughfare, giving the wide road enclosure/definition on its approach to the junction with the L1130.  • **L1130 local road**. In contrast to the design approach to the other external roads, the houses fronting the L1130 have a more suburban typology, and there are three parks/open spaces between the buildings along the road, thus generating a more suburban character and a permeable built frontage (with open space corridors entering the neighbourhood from the adjacent rural landscape).  This varied response to the surrounding landscape character/ conditions will strengthen the urban structure of the neighbourhood, and its legibility.
02 Connections - How well connected is the new neighbourhood?			
02a	There are attractive routes in and out for pedestrians and cyclists	Yes	The proposed development includes dedicated pedestrian and cycle paths along all four of the surrounding external streets. Internally, the road and open space networks (of the proposed development in combination with the three permitted neighbouring developments) combine to create a neighbourhood with a particularly high level of permeability and navigability for pedestrians and cyclists. Pedestrian and

Urban Design Criteria and Indicators		Yes/ No	Comment
			cycle access is prioritised by measures such as raised tables, shared surfaces and road buildouts to calm vehicular traffic where necessary. A key proposal at the wider neighbourhood scale is the extension of a greenway across the site along the Clonard Brook. This links to the existing greenway to the north east across Taylor Hill Boulevard, which traverses the suburban residential landscape on route to the town centre. 
02b	The development is located in or close to a mixed-use centre	Yes	The site (at the corner of the Clonard Road and Taylor Hill Boulevard) is approximately 500m from the existing Millfield Shopping Centre on the Clonard Road, and 1500m from the centre of Balbriggan, a self-sustaining town. The proposal also includes a small neighbourhood/village centre comprised of one retail and one café unit.
02d	The layout links to existing movement routes and the places people will want to get to	Yes	The site is located on the Clonard Road, the main road into Balbriggan from the west, and thus provides easy access by foot, bicycle, bus or car to the centre of the self-sustaining town. The site also has frontage to Taylor Hill Boulevard and the C Ring Road. The proposed development is thus very favourably located for access to schools, retail, employment, public open space and all other urban amenities in Balbriggan.
02e	Appropriate density, dependent on location, helps support efficient public transport	Yes	The proposed development is compliant with the *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities*. The additional population accommodated by the development will support the provision of local and metropolitan bus and train services (the Clonard Cross bus stop 50m from the site connects the site to Balbriggan town centre, Balbriggan train station, and Eden Quay in Dublin city centre.
03 Inclusivity – How easily can people use and access the development?			
03a	There is a range of public, communal and/or private amenity spaces and facilities for children of different ages, parents and the elderly.	Yes	The proposed development includes public/communal open spaces with formal playgrounds and natural play opportunities throughout the neighbourhood. These are connected by a network of linear spaces in accordance with the Green Infrastructure principle of connectivity of assets (to maximise accessibility and therefore the collective value of the assets). The landscape drawing of the south eastern part of the site below shows the extent and diversity of amenity space proposed.

Urban Design Criteria and Indicators		Yes/ No	Comment
			The predominant dwelling typology (houses) also ensures that the majority of the residents would be provided with private gardens.  Additionally, a large (c. 5 ha) Class 1 public open space is permitted on the Open Space zoned land a short distance to the north of the site along the L1130 (less than 500m from the site, i.e. comfortable walking distance). This will provide formal sports pitches and parkland for active and passive recreation for all age groups.
05 Efficiency - How does the development make appropriate use of resources, including land?			
05b	Landscaped areas are designed to provide amenity and biodiversity, protect buildings and spaces from the elements and incorporate SUDs	Yes	The Landscape Masterplan includes a range of open spaces of varying character designed to (a) provide passive and active recreation amenities for all age groups, (b) contribute to the area's place-identity, and (c) deliver a range of ecosystem services including habitat provision and water management (through SUDs measures). The retention of existing linear features (Clonard Brook and associated vegetation, and other existing hedgerows) is of particular biodiversity benefit.
06 Distinctiveness - How do the proposals create a sense of place?			
06a	The place has recognisable features so that people can describe where they live and form an emotional attachment to the place	Yes	• The proposed development retains key landscape features of the site, notably (1) the Clonard Brook and associated vegetation, (2) the three large trees off Taylor Hill Boulevard opposite the school, and (3) a number of hedgerows internal to the site. These features will contribute to local character and place-identity within the neighbourhood. • The comment in Row 01e above describes the proposal's varied architectural design response to the four surrounding public roads. This will complement the retained landscape features in the open space network in generating local character and identity within the neighbourhood. A combination of the varied internal landscape character/identity and the varied surrounding conditions (the four roads) led to the division of the wider neighbourhood (i.e. the proposed development and three adjacent permissions) into six character areas. Each area has a distinct materiality from the others, so that sub-neighbourhoods can be recognised and described based on a combination of their location and architecture.

Urban Design Criteria and Indicators		Yes/ No	Comment
			
06b	The scheme is a positive addition to the identity of the locality	Yes	Refer to 01e and 06a above.
06c	The layout makes the most of the opportunities presented by existing buildings, landform and ecological features to create a memorable layout	Yes	Refer to 01c & d, and 06a above.
06d	The proposal successfully exploits views into and out of the site	Yes	Views are afforded along the Clonard Brook (which traverses the neighbourhood) from Taylor Hill Boulevard to the north east and the L1130 to the south. Additionally, there are open spaces positioned alongside Taylor Hill Boulevard (opposite the school) and at two further locations on the L1130. These spaces allow views of the rural landscape to the south west (and views into the neighbourhood from the passing road).
07 Layout - How does the proposal create people friendly streets and spaces?			
07a	Layout aligns routes with desire lines to create a permeable interconnected series of routes that are easy and logical to navigate around.	Yes	See 02a and 02d above.
07b	The layout focuses activity on the streets by creating active frontages with front doors	Yes	The overall layout and individual buildings are designed to create active frontages and passive surveillance throughout the neighbourhood.

Urban Design Criteria and Indicators		Yes/ No	Comment
	directly serving the street		
07c	The streets are designed as places instead of roads for cars, helping to create a hierarchy of space with less busy routes having surfaces shared by pedestrians, cyclists and drivers	Yes	Refer to 02a above.
07d	Block layout places some public spaces in front of building lines as squares or greens, and some semi private space to the back as communal courts	Yes	See diagram in 03a above. This shows some of the open space positioned adjacent to the surrounding public roads, providing amenities easily accessed by the wider community. There are also communal open spaces within the neighbourhood, physically removed from the surrounding public roads, providing communal space for the residents.
08 Public Realm - How safe, secure and enjoyable are the public areas?			
08a	All public open space is overlooked by surrounding homes so that this amenity is owned by the residents and safe to use. Play areas are sited where they will be overlooked, safe and contribute to the amenities	Yes	All open space and play areas are overlooked.
08b	The public realm is considered as a usable integrated element in the design of the development	Yes	Refer to 02a and 03a.
08d	There is a clear definition between public, semi private, and private space	Yes	See 03a.
08e	Roads and parking areas are considered as an integral landscaped element in the design of the public realm	Yes	See 02a.
12 Detailed Design - How well thought through is the building and landscape design?			
12a	The materials and external design make a positive contribution to the locality	Yes	The drawings, design statements and the photomontages prepared for the LVIA show that the proposed buildings and landscape are of appreciably high design and material quality. The development would be a positive addition to the urban landscape of Balbriggan.

Based on the assessment in Table 10.6 and the visual impact assessment in Section 10.6.3, the landscape impacts can be classified positive.

10.8 DO NOTHING IMPACTS

The site would remain in agricultural use and the FDP's residential land use objective for the land would be unrealised. The site would not contribute to the ongoing, plan-led change in the landscape character of the area, from previously rural/agricultural to an urban residential neighbourhood. The landscape would continue to appear transitional/incomplete in places. The planned urban edge, and the gateway to the Balbriggan urban area on the Clonard Road, would continue to be poorly defined in the landscape/urban structure.

10.9 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

10.9.1 CONSTRUCTION PHASE

The negative landscape and visual impacts of construction are an unavoidable consequence of development and there is limited potential for mitigation. Site hoarding would screen ground level activity, (low) stockpiles, vehicles, etc. but once the buildings grow above ground floor level, they would be visible above the hoarding, as would cranes, scaffolding and construction activity on the buildings themselves. No landscape or visual-specific mitigation is recommended other than standard best practice construction site management, which should include the erection and maintenance of hoarding on the site boundaries.

The above assumes that the tree protection measures recommended in the *Arboricultural Report* (June 2024) by Charles McCorkell Arboricultural Consultancy will be fully implemented. The retention of certain trees and hedgerows on the site is an important part of the proposed development, and any loss of these features would constitute a negative landscape impact. The McCorkell report states: *"All retained trees and hedgerows can be successfully protected during the proposed development works by using robust fencing measures which comply with the recommendations outlined within BS 5837:2012"*. Section 2: Arboricultural Method Statement of the McCorkell report sets out the method by which the trees and hedgerows would be protected during construction.

10.9.2 OPERATION PHASE

The potential landscape effects of the proposed development have been classified 'moderate positive' (based on an analysis of the proposal against the relevant criteria in the *Urban Design Manual – A Best Practice Guide (2009)*). The urban design criteria place considerable emphasis on a proposed developments' responsiveness (in layout, built form, architecture and landscape design) to the landscape context and sensitivities in the receiving environment. Such responsiveness is effectively 'embedded mitigation' in design. The analysis in Table 10.6 above shows that the proposed development responds appropriately and effectively to the site and its context. No further mitigation measures are required/recommended.

10.10 PREDICTED IMPACTS

10.10.1 VISUAL IMPACTS

Since no mitigations measures are deemed necessary, the predicted impacts are the same as the potential impacts described in Section 10.6.3 above. The impacts are summarised in Table 10.7 overleaf.

Table 10.7: Summary of predicted visual impacts (construction and operational phases)

Viewpoint Location	Viewpoint Sensitivity	Proposed Development CONSTRUCTION PHASE (Temporary)		Proposed Development OPERATION (Permanent)		Cumulative (with permitted Ladywell Phases 3A, 3B and 3C)	
		Magnitude of Change	Significance of Effects	Magnitude of Change	Significance of Effects	Magnitude of Change	Significance of Effects
01 R122/Clonard Road approaching the site (and Balbriggan) from the M1	Medium	Medium	Slight Negative	Medium-High	Significant Positive	n/a	n/a
02 Entrance to house across the R122/Clonard Road from the site	Medium	Medium	Slight Negative	Medium-High	Significant Positive	n/a	n/a
03 Taylor Hill Boulevard approaching site frontage from the Clonard Road to the south	Low-Medium	Low	Slight Negative	Medium	Moderate Positive	Medium	Moderate Positive
04 Taylor Hill Boulevard approaching site from the north	Low-Medium	Low	Slight Negative	Medium	Moderate Positive	High	Significant Positive
05 Taylor Hill Gardens	Medium	Medium	Slight Negative	Medium-High	Significant Positive	High	Significant Positive
06 L1130 at 'House 2'	Medium	Medium	Slight Negative	Medium-High	Moderate Positive	n/a	n/a
07 L1130 at 'House 3'	Medium	Medium	Moderate Negative	Medium-High	Moderate Neutral	Medium-High	Moderate Neutral
08 L1130 approaching the site from the north	Low-Medium	Medium	Slight Negative	Medium-High	Moderate Positive	Medium-High	Moderate Positive

10.10.2 LANDSCAPE IMPACTS

10.10.2.1 Construction Phase

The significance of the landscape impact during construction would be moderate negative in the immediate environs (the small number of neighbouring houses and the adjacent roads). The significance of the impact would reduce with distance from the site. Construction is inherently disturbing of the landscape, and unsightly. There is no potential to mitigate the impact, apart from site hoarding and good construction site management. However, the impact would be temporary, and following construction the landscape impacts of the development would be positive.

10.10.2.2 Operation Phase

The significance of the operation phase landscape impact would be moderate positive. The development would contribute positively to an ongoing, plan-led process of landscape change in the area. An assessment of the proposal against the relevant criteria of the *Urban Design Manual – A Best Practice Guide (2009)*, and consideration of the visual impact assessment, indicates that the landscape impact can be classified positive.

10.10.3 INDIRECT IMPACTS

There would be no indirect impacts on the landscape or visual amenities.

10.10.4 SECONDARY IMPACTS

There would be no secondary impacts on the landscape or visual amenities.

10.10.5 WORST CASE SCENARIO

The worst-case scenario would be if construction were stalled at any point during the construction process leaving the site landscape in a disturbed/incomplete condition.

10.10.6 CUMULATIVE IMPACTS

The site forms part of a large RA 'Residential Area' zoned block of land contained by the Clonard Road, the future C Ring Road, the L1130 local road and Taylor Hill Boulevard. Planning permission has been granted for three residential developments within this block of land (Reg Refs F21A/0055, F22A/0670 and F22A/0670, known as Ladywell Phases 3A, 3B and 3C – see Figure 10.3 above). The proposed development would infill the remaining areas in this block of land (apart from two residential properties along the L1130), completing the Ladywell residential neighbourhood and is to be known as Folkstown LRD.

In addition, there is an LRD permission located adjacent to the north (LRD0006/S3 & ABP Ref: LH06F.319343) granted by the Board on the 4th of July 2024, which relates to the development of 564 no. dwellings in a mix of apartments, houses and commercial units as well as open space.

10.10.6.1 Visual Impacts

The cumulative visual impacts have been considered for the eight representative viewpoints. The results of the assessments are provided in Table 10.7 above.

10.10.6.2 Landscape Impacts

The proposed development:

- Adopts and extends the established urban grain (the pattern of streets, blocks and open spaces) of the neighbouring permitted developments (Reg Refs F21A/0055, F22A/0670 and F22A/0670).
- Uses the two already permitted vehicular entrances off Taylor Hill Boulevard to provide access.
- Combines with the permitted Ladywell developments to jointly enclose/define public open spaces, completing a connected network of green infrastructure across the combined neighbourhood.
- Uses (mostly) the same building typologies and adopts a similar architectural character and materials palette to the neighbouring Ladywell developments.
- Combines with the permitted developments to complete the street elevations of Taylor Hill Boulevard (see photomontage for Viewpoint 4) and the future C Ring Road.
- Provides the local 'village centre' for the combined Ladywell neighbourhood.
- Combines with the permitted Flemington Lane LRD to provide built enclosure to the C Ring Road as it passes the site.

The development would thus integrate seamlessly with the neighbouring developments, and their cumulative landscape impact during operation would be significant positive.

10.11 MONITORING

No monitoring of landscape or visual impacts is proposed.

10.12 REINSTATEMENT

No reinstatement is required assuming the development would be carried out and completed in accordance with the plans.

10.13 INTERACTIONS

- **Population and Human Health**. The proposed development would deliver key elements of a high quality new residential neighbourhood well served by public and communal open space and with good access to schools, retail, employment and other land uses and amenities provided by the self-sustaining town of Balbriggan. The related change to the landscape character, i.e. the planned expansion of the urban area to the settlement boundary, would have significant positive population and human health benefits (by providing homes offering a high level of residential amenities).
- **Biodiversity**. The proposed development retains key landscape elements/features including the Clonard Brook and associated vegetation, several hedgerows internal to the site, and several mature trees. As well as being of landscape and visual amenity value, these are important habitats, and their retention and protection, along with extensive new planting throughout the new neighbourhood, would have biodiversity benefits.

10.14 DIFFICULTIES ENCOUNTERED IN COMPILING THE LVIA CHAPTER

No difficulties were encountered in carrying out the assessment.

11.0 MATERIAL ASSETS – TRAFFIC

11.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report assesses the likely impact of the proposed housing development in terms of vehicular, pedestrian and cycle access during both the construction and operational phases.

The chapter describes the methodology used; the receiving environment at the application site and surrounding area; the characteristics of the proposed development; the potential effects during both the construction and operational phases; the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects; and any residual impacts that may remain.

This chapter has been prepared by Transport Insights and is has been informed by a number of reports prepared in support of the Ladywell Masterplan development including the following:

- Traffic & Transport Assessment Report (ref 191034-TTA01), prepared by MPA Consulting Engineers, dated 18 January 2021;
- Technical Note 04 – 2040 Junction Assessments (ref 191034-TN04); prepared by MPA Consulting Engineers, dated 30 June 2021;
- Traffic & Transport Statement (ref 191034-TTS01); prepared by MPA Consulting Engineers, dated 26 August 2022; and
- Traffic & Transport Assessment and Mobility Management Plan (ref C1041 2023) prepared by Transport Insights, v1.18 dated July 2024.

Furthermore, the following documents pertaining to the Flemington Lane LRD (ABP Reg. Ref. ABP-319343-24) have also been reviewed and have informed the content of this chapter:

- Environmental Impact Assessment Report, Chapter 12: Material Assets – Transport, prepared by MPA Consulting Engineers, dated July 2023 (entire EIAR Report);
- Traffic and Transport Assessment Report (ref 191004-TTA01); prepared by MPA Consulting Engineers, dated 23 September 2021; and
- and Traffic and Transport Assessment Update Report (ref 191004-TTA02); prepared by MPA Consulting Engineers, dated 30 June 2023.

11.2 EXPERTISE AND QUALIFICATIONS

The Traffic and Transport Chapter of the EIAR was prepared by Eoin Munn as Project Director, Jurek Gozdek as Project Manager and Narendra Jillelamudi as Consultant Transport Planner (all of Transport Insights Limited). Details of their experience and qualifications are provided within the following Table.

Table 11.1: Competency of Chapter Authors

Reviewer	Eoin Munn
Title	**Director (Project Director)**
Relevant Experience and Qualifications	Experience Over 12 years' experience working within Transport Planning and Engineering, including project management of a variety of small to large sized projects from feasibility to detailed design stage. Recent experience in providing transport planning support (including production of Traffic and Transport Assessment and Mobility Management Plans) in relation to residential developments includes a 233-no. unit residential development at Enniscorthy, Co. Wexford, a 282-no. unit residential development at Brickfield Drive, Crumlin, Dublin 12, and a 321 no. units residential development at Jamestown Road, Finglas, Dublin 11.

	Qualifications: • BSc Transport Operations, Technological University Dublin (2003-2007) • MSc Business Analytics, University College Dublin (2007-2008)
Professional Membership	• Member, Transport Planning Society (MTPS)
Principal Author	**Jurek Gozdek**
Title	**Senior Consultant Transport Planner (Project Manager)**
Relevant Experience and Qualifications	Experience: Over 6 years' experience working within Transport Planning and Engineering, Jurek has project-managed and supported delivery of multiple traffic and transport assessment projects for a variety of residential and commercial developments across Ireland. Recent experience in providing transport planning support (including production of Traffic and Transport Assessment and Mobility Management Plans) in relation to residential developments includes a ca. 500-unit scheme at Hole in The Wall Road, Clongriffin; a ca. 40-unit scheme at Keeper Road, Drimnagh, and a ca. 270-unit scheme at Chapelizod Hill, Chapelizod (all on behalf of private developers). Qualifications: • BScEng (Transport Engineering), Warsaw University of Technology (2017) • MSc (Geographic Information Science), Technological University Dublin (2021)
Professional Membership	• Member, Transport Planning Society (MTPS)
Second Author	**Narendra Jillelamudi**
Title	**Consultant Transport Planner (Analyst)**
Relevant Experience and Qualifications	Experience: Over 4 years' experience working within Transport Planning and Engineering, on a variety of public and private sector projects including providing analytical support for a 100-no. unit residential development at Firhouse, Dublin 24. Narendra is currently providing analytical support for a 158-no. unit residential development at Mungret, Co. Limerick. Qualifications: • B.Tech in Civil Engineering, Aacharya Nagarjuna University (2012-2016) • M.Tech in Traffic and Transportation Planning, NIT Calicut (2017-2019)
Professional Membership	• Member, Chartered Institution of Highways and Transportation (CIHT)

11.3 STUDY METHODOLOGY

The following methodology has been adopted for this assessment:

Review of relevant available information including:

- Fingal County Development Plan 2023-2029;
- Existing traffic information and other relevant studies outlined in Section 11.1 above;
- Site visits to quantify existing road network issues and identify local traffic characteristics;
- Detailed estimation of the transport demand that will be generated by the development both during the construction and operation phases; and
- Assessment of the impact of traffic on the local road network, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

This section of the EIAR outlines the methodology followed in order to carry out the Traffic and Transport Assessment set out within this Chapter. The approach pursued in undertaking the Assessment is consistent with the national best practice, namely Transport Infrastructure Ireland's (TII's) Traffic and Transport Assessment Guidelines (May 2014).

The existing conditions on the surrounding road network were informed by a site assessment undertaken on Wednesday 28 February 2024 (between the hours of 14:30hrs and 17:45hrs and coinciding with the typical PM traffic peak.

A list of guidance documents that have informed specific parts of the Assessment is set out in Section 11.3.1 of this EIAR Chapter. The Assessment is in accordance with the guidance documents set out therein.

It should be noted that a comprehensive Traffic and Transport Assessment (TTA) Report, which includes a Mobility Management Plan (MMP), has been produced in relation to the proposed development and is included in the application package.

11.3.1 RELEVANT LEGISLATION & GUIDANCE

The EIAR Traffic and Transport Assessment has been prepared in accordance with the following policy and technical guidance documents:

- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017);
- Sustainable Urban Housing: Design Standards for New Apartments (July 2023);
- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (January 2024)
- Fingal Development Plan 2023-2029;
- Transport Infrastructure Ireland (TII) (2014) Traffic and Transport Assessment Guidelines;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts (October 2016);
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021); and
- Design Manual for Urban Roads and Streets (DMURS) (May 2019).

11.3.2 STUDY AREA

With regard to traffic impact assessment, the Study Area of this EIAR chapter has included the section of the R122 regional road bounding the application site to the south, including the R122/ Boulevard Road Junction, which shall carry all development traffic prior to delivery of the C-Ring Road (see: Section 11.5.6.1) in the future. This EIAR chapter presents the expected impact of the proposed development on the traffic volumes, with the outputs thereof feeding into other EIAR chapters. The Study Area includes the part of the regional road network directly receiving the traffic generated by the proposed development, which will subsequently distribute to other parts of the wider road network. Such definition of the Study Area is aligned with best practice. It should be noted that this EIAR Chapter has examined the application site's mobility-related characteristics with respect to a wider area of interest, including the entirety of Balbriggan Town.

11.3.3 CONSULTATION

Prior to a pre-planning Section 247 meeting, a Transport Briefing Note included in Appendix F of Volume III of the EIAR, was submitted to Fingal County Council's (FCC's) Planning and Strategic Infrastructure Department as part of the overall pre-application package. Written feedback was provided in response, with several further recommendations provided in the meeting. A Section 247 Pre-Application Consultation Meeting was held on the 24th of January 2024 and attended by representatives of the FCC and the Applicant. Following the meeting, written notes were issued to the Applicant's team by FCC including further transport-related feedback (feedback included at Appendix F of Volume III of the EIAR). This EIAR is aligned with the received instructions.

11.3.4 SITE SURVEYS/INVESTIGATIONS

To assess the proposed development's potential impact, an appreciation of the existing situation first needs to be established. This section of the EIAR describes the existing site layout, access arrangements, the local road network and background traffic conditions. The existing conditions presented herein represents an evidence-based review, and have been informed by:

- a desktop review of the study area and its surrounding transport network, including general traffic road infrastructure, facilities for pedestrians and cyclists and public transport infrastructure and service provision; and
- a site assessment, undertaken on Wednesday 28 February 2024 (between the hours of 14:30hrs and 17:45hrs and coinciding with the typical PM traffic peak) to confirm facilities and operating conditions for all road users on the adjoining road network; and

11.4 DIFFICULTIES ENCOUNTERED

No difficulties were encountered when compiling this EIAR Chapter.

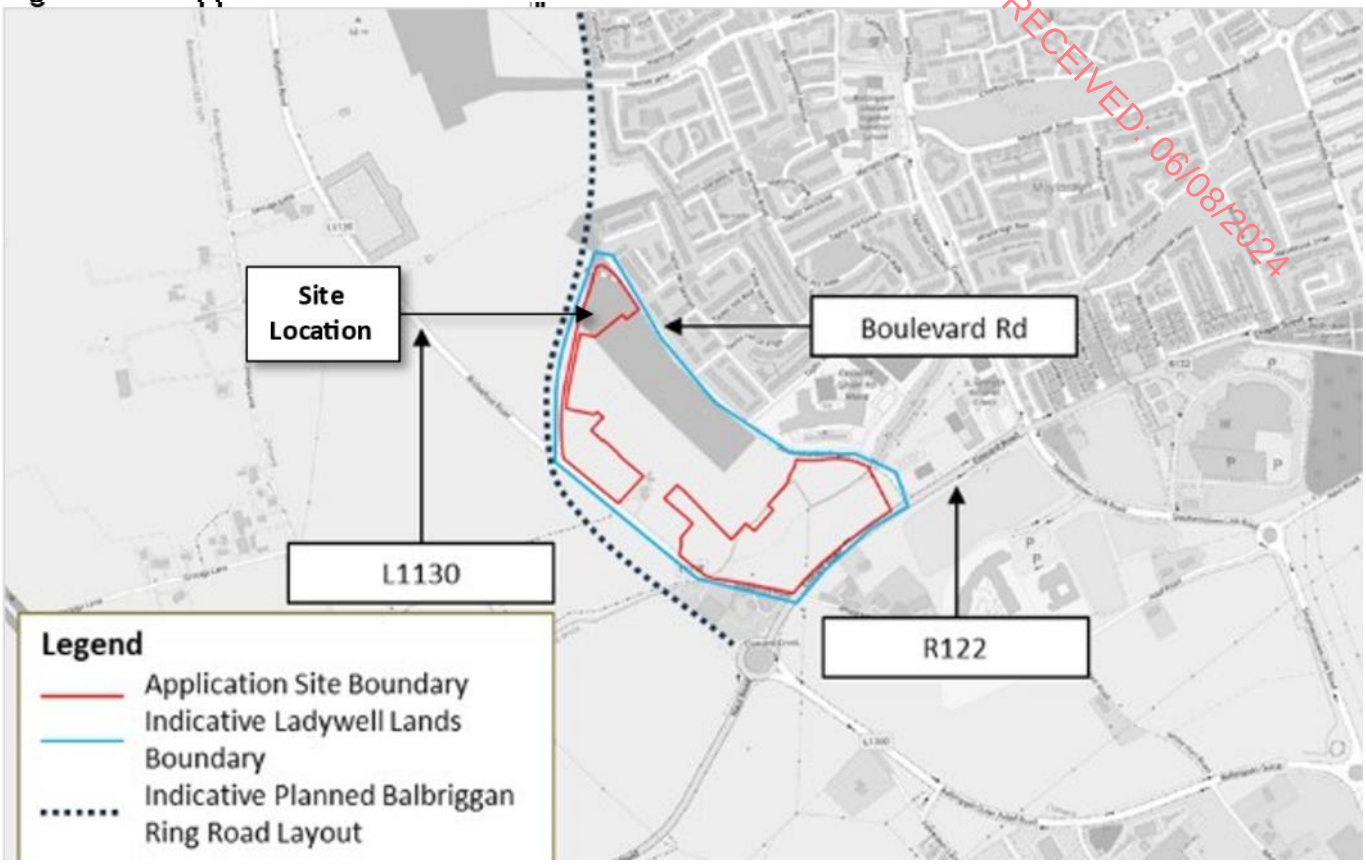
11.5 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

This section considers the baseline conditions, providing background information for the site in order to determine the significance of any traffic implications. This section also considers the existing accessibility of the site by sustainable modes of transport.

11.5.1 SITE LOCATION

The Ladywell site is located west of Balbriggan, on lands generally bounded by the R122 in the south, a local road, L1130 in the west, the planned Balbriggan Ring Road in the north and Boulevard Road in the east. The site is a ca 12-hectare greenfield site and has been zoned 'RA – Residential" in the Fingal Development Plan 2023-2029. A large part of the site has been granted planning permission for residential development, which has been henceforth referred to as Phase 3. The current proposed development, referred to as Phase 4, shall take up the northern, western and southern extremities of the site, connecting to the respective fringes of the permitted Phase 3 development and partially replacing it. The location of the Phase 4 application site within the wider Ladywell site is presented in Figure 11.1, which follows.

Figure 11.1: Application Site Location



11.5.2 SITE PLANNING HISTORY

The Ladywell site has previously been planned for Phase 3 development (with several sub-phases), with the initial Phase 3A application (FCC Reg. Ref. F21A/0055) submitted in 2021 and subsequent Phase 3B (FCC Reg. Ref. F22A/0526) and Phase 3C (FCC Reg. Ref. F22A/0670) submitted in 2022 (all applications received a final grant of permission in 2023). The original Phase 3 Masterplan was envisaged to include a total of 328 no. residential units in addition to a Local Centre with 540 sqm commercial floor area across four phases (Phase 3A to 3D). It was supported by a Traffic and Transport Assessment (referred to henceforth as the Original TTA) undertaken by MPA in January 2021 and an EIAR (henceforth referred to as the Original EIAR), whose Material Assets – Transport Chapter was also prepared by MPA. The documents were based on traffic count data collected in 2018. The TTA involved developing an area-wide traffic model to identify the proportional increase in traffic levels at a number of junctions on the R122 corridor. Among those junctions, 4 no. were analysed in detail using junction modelling software, as follows:

- R122/ Balbriggan Ring Road (South) Roundabout
- R122/ Boulevard Road Junction
- R122/ Castlemill Link Road Junction
- R122/ Millfield Shopping Centre Access Roundabout

It should be noted that the Original TTA only involved junction modelling with regards to the 2025 assessment year, which was assumed to be the first full year of the completion of the Ladywell development in its entirety. At further information stage the scale of the proposed development's residential component was reduced to 311 no. units and additional traffic modelling was undertaken, considering the 2040 assessment year (i.e. Year of Opening + 15 years), with development traffic generation somewhat reduced to reflect the decrease in the number of units. The outputs of the 2040 traffic modelling were included in Technical Note 4, further referred to as TN04.

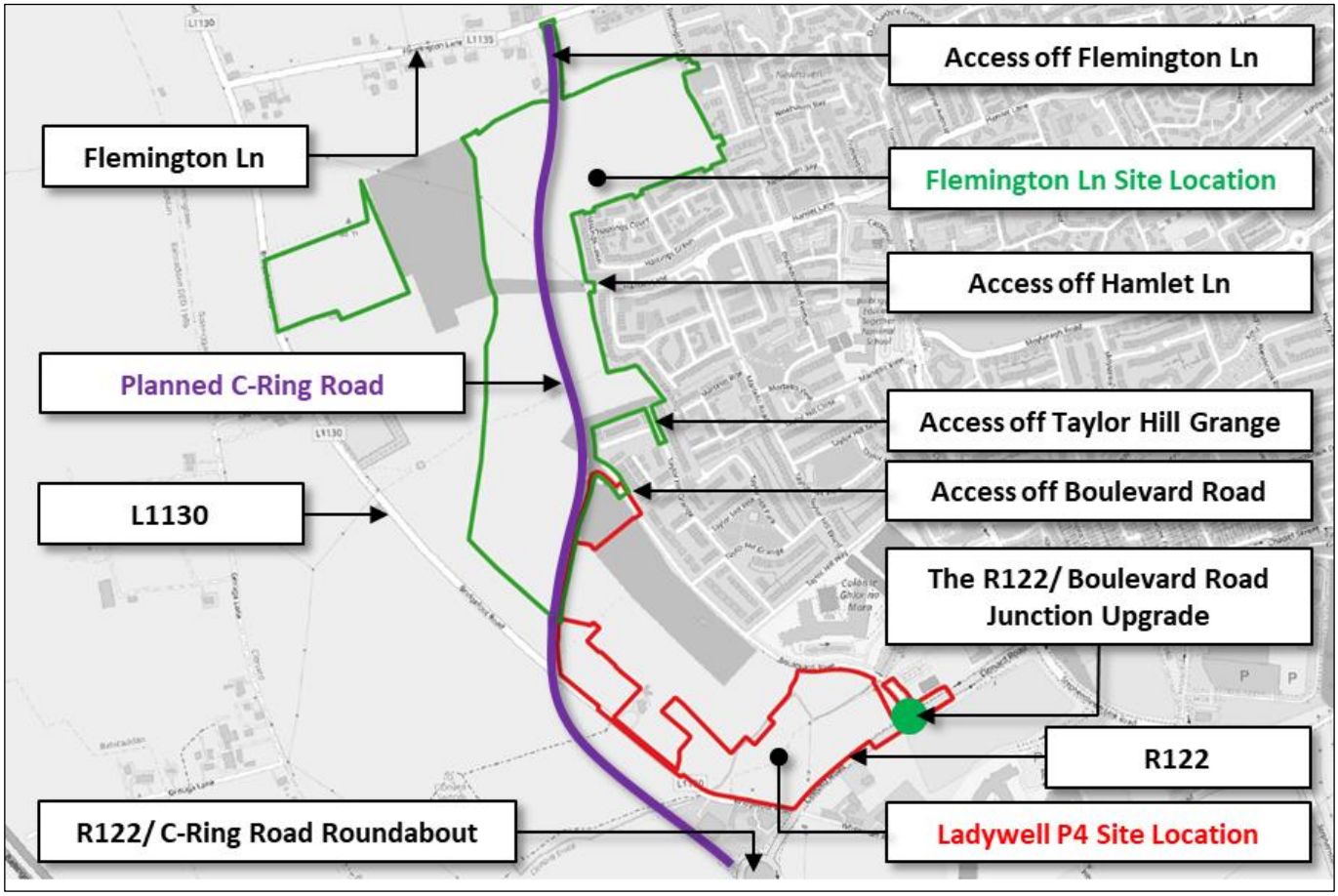
The Phase 3B application (FCC Reg. Ref. F22A/0526) included further alterations versus the original Masterplan, reducing the overall scale of development to 306 no. units. It has been supported by a Traffic and Transport Statement (TTS), which represented an update of the Original TTA Report. To reflect the amended scale of development and unit type mix in the TTS, the trip generation was recalculated using unit rates consistent with the Original TTA (derived from the TRICS trip rate database). No further traffic survey data collection or traffic modelling were undertaken to support the TTS. The Phase 3C application (FCC Reg. Ref. F22A/0670) was itself consistent in terms of scale with the Phase 3B application and as such included no individual traffic and transport assessment documentation, with the Phase 3C (Original) EIAR being underpinned by the TTS, the Original TTA, and TN04.

It should be noted that the current proposed Phase 4 development will partially replace and supplement the planned Phase 3 development, including permitted Phases 3A-C and planned phase 3D. If completed, Phase 4 will result in an increase in the total number of residential units across the Ladywell site from 306 no. (as per the Phase 3 Masterplan altered in accordance with the Phase 3B and 3C applications [FCC Reg. Refs. F22A/0526 and F22A/0670]) to 434 no. units (an increase by 128 no. units 42%), while the ancillary local centre (i.e. commercial/ retail) component will be reduced from 540 sqm to 350 sqm. The approach pursued herein is fully consistent with that applied for the preceding Phase 3B and 3C applications and is cognisant of the Original EIAR supporting the Phase 3C application.

11.5.3 RELEVANT THIRD-PARTY DEVELOPMENTS

As detailed in Section 11.9.1, a range of third-party developments have been considered to identify those that might result in an increase in future background traffic above that accounted for by applying the general traffic growth factors. Among those considered, the Flemington Lane residential development has been identified as relevant. The location and access arrangements of that development are shown in Figure 11.2, which follows.

Figure 11.2: Flemington Lane Scheme Location

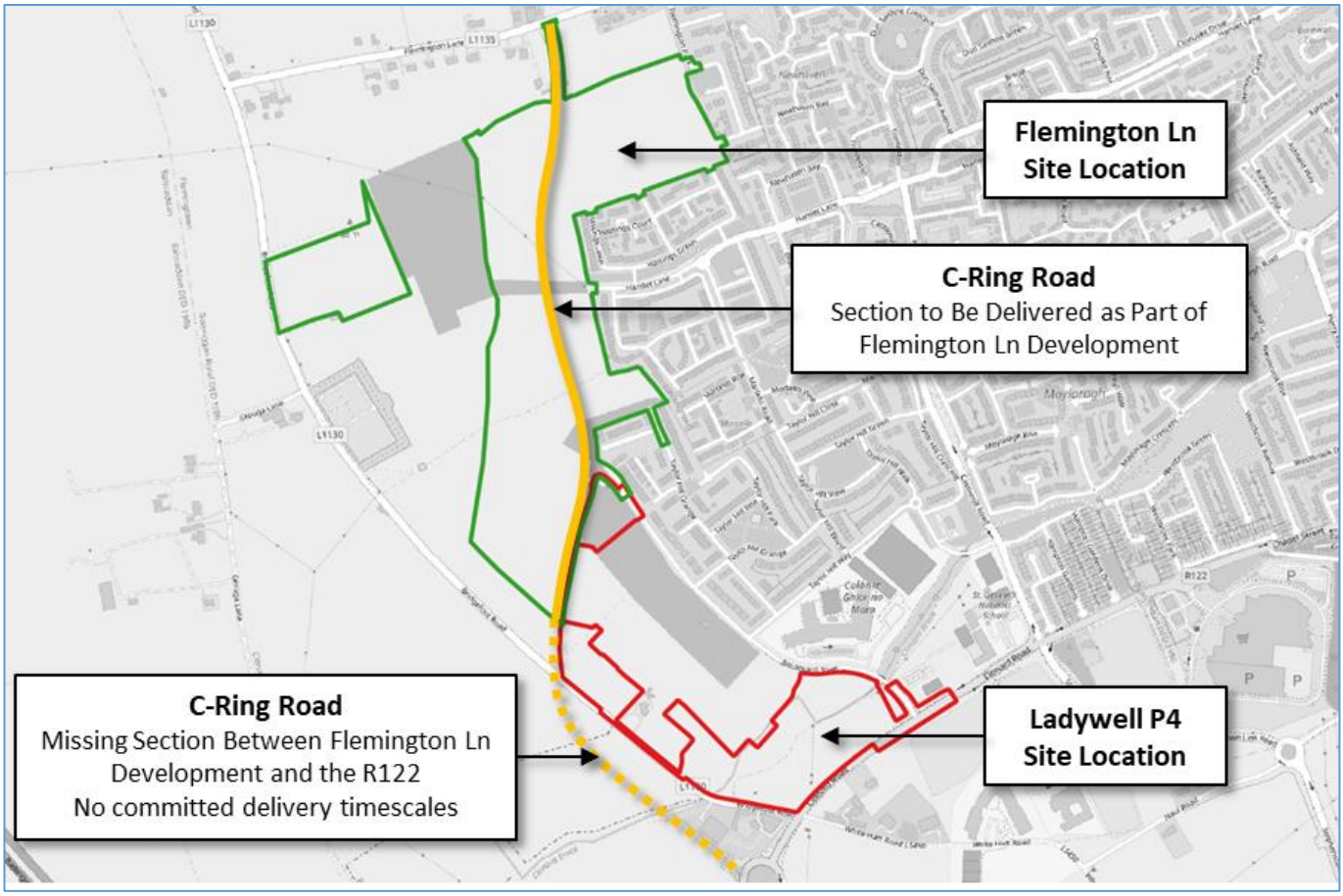


The Flemington Lane application was submitted to FCC on 12 July 2023. The proposal included 564 no. units comprising 378 no. houses, 84 no. apartments, and 102 no. duplexes, in addition to 9 no. commercial units and 6 no. communal units. The proposed Flemington Lane development included a single main north-south spine road, which was intended to form the northern part of the C-Ring Road (i.e. the distributor road connecting Flemington Lane to the R122 Roundabout). Overall, the development would include 4 no. public road accesses. Delivery of the internal road network, including the spine road, was to be completed in stages, aligned with subsequent phases of the residential development.

Following consideration of the application including a response to a request for further information, FCC decided to refuse permission for the proposed development on 22 February 2024.This decision was appealed to An Bord Pleanála (ABP) and ABP subsequently decided to overturn the previous refusal and to grant permission for the Flemington Lane development subject to Conditions. It is understood from these Conditions that the Applicant is to construct a section of the spine road (C-Ring Road) within the red line boundary of the site and transfer ownership of land within their ownership along the alignment of the road to FCC. However, the requirement was limited to constructing the C-Ring Road within the site, and development of the full scheme was not explicitly linked to delivery of the complete C-Ring Road.

The entire Flemington Lane development shall therefore largely depend on the existing road network prior to the delivery of the southern C-Ring Road section, as shown in Figure 11.3, with the Flemington Lane application to access primarily through the Boulevard Road/R122 junction prior to delivery of the C-Ring Road. This junction would however be upgraded to a signal-controlled junction with dual vehicular lanes on each approach to the junction.

Figure 11.3: Staged Delivery of the C-Ring Road



11.5.4 SURROUNDING ROAD NETWORK

11.5.4.1 R122 Regional Road

R122 is a two-way regional road, which runs in an east-west alignment and connects the Naul Village and Balbriggan.

R122 has a uniform horizontal and vertical alignment adjacent to the development site. Its carriageway adjacent to the site is approximately 10.0 metres wide, and its overall cross-section includes a single general traffic lane in each direction. Cycle tracks and footpaths are provided on both sides of the road, separated from the carriageway by grass verges.

No on-street car parking facilities are provided on R122. A 60 km/ h speed limit is in operation on this road in the application site's vicinity and public street lighting is present.

11.5.4.2 L1130 Local Road

L1130 is a two-way, single carriageway local road, which runs in an north-south alignment and forms part of a local road link from the R132 at Gormanstown in the north via Bridgefoot, Flemoingtown, and Clonard Cross, connecting to the R132 again in southwest Balbriggan. The L1130 is noted to be also referred to as Clonard Road in some external sources, however this name has not been used herein to avoid confusion with R122.

L1130 has a uniform horizontal and vertical alignment adjacent to the development site. Its carriageway adjacent to the site is approximately 5.5 metres wide, with no road markings provided to delineate traffic lanes in opposite directions. The carriageway is bounded by green verges and ditches alongside the application site's boundary, with the overall road environment being rural in nature.

No walking or cycling infrastructure or car parking facilities are provided along the road. A general 80 km/h speed limit is in operation on this road, reduced to 60 km/h at a ca. 350 metres section north of the R122 junction. No street lighting is present.

11.5.4.3 Boulevard Road

Boulevard Road is a two-way, single carriageway local road, which runs in a north-south alignment from a T-junction with the R122 for ca. 700 metres to the north.

Boulevard Road has a uniform vertical alignment adjacent to the development site, with an S-curve bend in its southern part (close to the R122 junction). Its carriageway adjacent to the site is approximately 7.0 metres wide, with no road markings provided to delineate traffic lanes in opposite directions.

Cycle tracks and footpaths are provided on the eastern side of the carriageway and partially also on the western side, separated from the carriageway by grass verges.
No formal on-street car parking facilities are provided on Boulevard Road. A 50 km/ h speed limit is in operation on this road and public street lighting is present.

11.5.5 KEY JUNCTIONS

11.5.5.1 R122/ Boulevard Road Junction

The R122/ Boulevard Road Junction is a 3-arm priority (stop) controlled junction located adjacent to the application site's southeastern corner, where Boulevard Road (secondary road) approaches the R122 (main road) from the north. The northern (Boulevard Road) and western (R122 West) arms have two lanes (one per direction) each, with the eastern (R122 East) arm having a single egress lane and two approach lanes: a through-lane for westbound traffic and a right-turn lane for northbound traffic.

Footpaths and cycle tracks are provided along the R122 and Boulevard Road, with dropped kerbs provided to facilitate crossing the Boulevard Road arm. Street lighting and standard signage, with a stop-sign at the northern (Boulevard Road) approach, are provided at the junction.

11.5.5.2 R122/ L1130 Junction

The R122/ L1130 Junction is a 4-arm priority (stop) controlled junction located adjacent to the application site's southwestern corner, where the L1130 (secondary road) intersects the R122 (main road). All junction arms have two lanes. It should be noted that the yielding L1130 arms (i.e. the eastern and western arms) are somewhat staggered and approach the R122 at an off-right angle.

Footpaths and cycle tracks are provided along the R122 and dropped kerbs are provided to facilitate crossing the L1130 arms. Street lighting and standard signage, with a stop-sign at the eastern and western (L1130) approaches, are provided at the junction.

Following the LRD opinion and the response, it is not now proposed to provide direct vehicular access from the proposed development site onto the L1130, so the development traffic will not utilise the L1130 arm of the R122/L1130 junction. The proposed development does not however prevent future upgrade of this junction, if required and which is shown in drawing no. 2023-126-040195 - L1130 Clonard Junction Future Signalisation Review.

11.5.5.3 R122/ Balbriggan Ring Road Roundabout

The R122/ Balbriggan Ring Road is a large, 4-arm roundabout with an inscribed circle diameter (ICD) of ca. 70 metres and two traffic lanes on the circulating carriageway. The roundabout is located ca. 100 metres to the southwest from the application site's southwest corner. Flared two-lane approaches and single egress lanes

are provided at each arm of the roundabout. The northern arm is currently unused and will in the future connect to the northwestern section of Balbriggan Ring Road (the C-Ring Road).

Pedestrian and cyclist facilities are available along each road approaching the roundabout, with pedestrian crossings provided across the southern and eastern arms. Street lighting and standard signage and road markings are provided.

11.5.6 FUTURE ROAD INFRASTRUCTURE UPGRADES

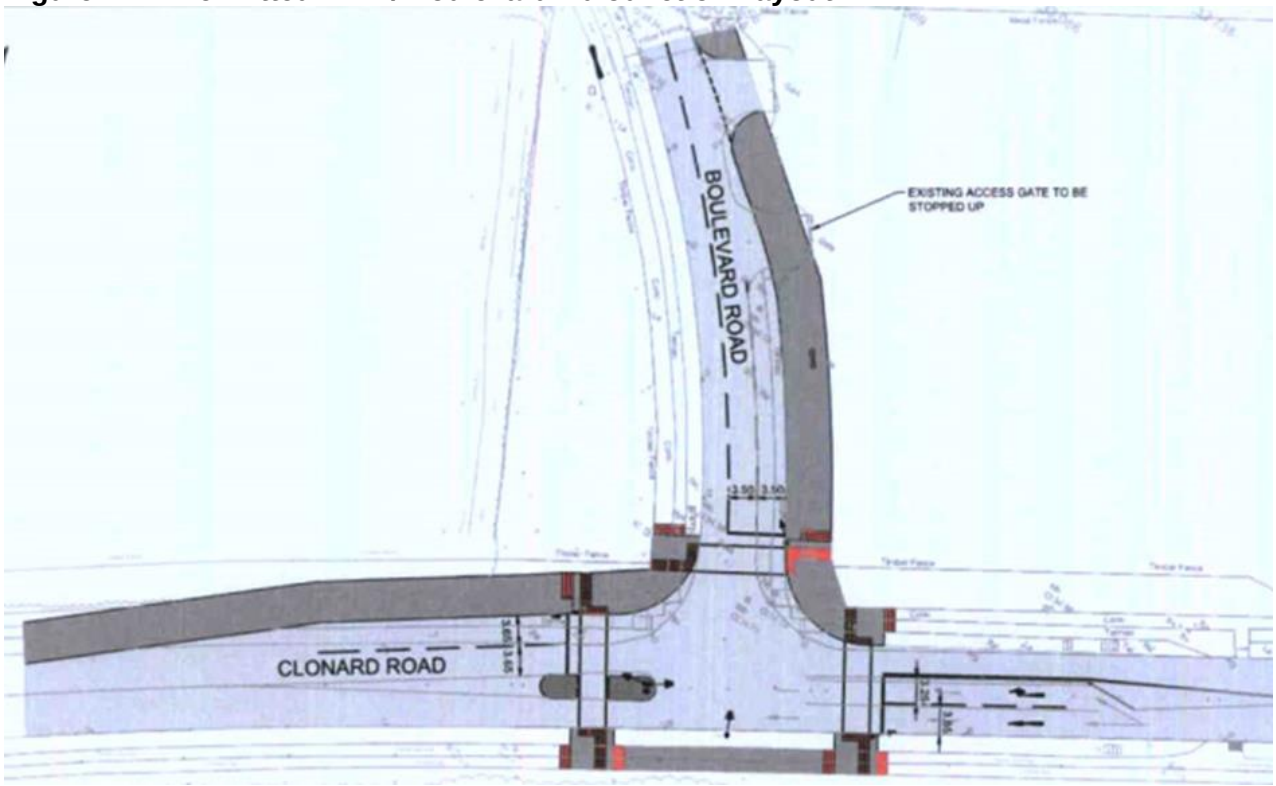
11.5.6.1 Balbriggan (Northwestern) Ring Road (C-Ring Road)

Balbriggan (Northwestern) Relief Road, also referred to as the C-Ring Road, is a planned single carriageway distributor road, which shall connect the existing R122/ Balbriggan (Southwestern) Ring Road Roundabout (located ca. 100 metres to the southwest from the application site's southwestern corner) to the R132 in north Balbriggan. The road will bypass the existing built-up or zoned lands in urban Balbriggan and will form the application site's northern boundary. The *Balbriggan Ring Road R122 to R132* scheme has been included in the *Fingal Development Plan 2023-2029* among the FCC's proposals for development of Fingal's transportation network. While exact delivery timescales of the C-Ring Road completion in its entirety are unclear, it is understood that it will be delivered in stages to accompany development of the adjacent area located to the north. The northern section of the C-Ring Road should be delivered as part of the permitted Flemington Lane development.

11.5.6.2 R122/ Boulevard Road Junction Upgrade

The R122/ Boulevard Road Junction shall be upgraded as part of the permitted Flemington Lane residential development, which should be delivered under similar timescales to the current proposed Ladywell Phase 4. The junction upgrade should be delivered in the first phase of the Flemington Lane development construction and will involve signalisation of the junction, as well as provision of flared two-lane approaches at all arms. Permitted junction layout is presented in Figure 11.4,

Figure 11.4: Permitted R122/ Boulevard Rd Junction Layout



As can be seen in the preceding figure, the R122/ Boulevard Road Junction upgrade, as permitted, would involve full signalisation of the junction and provision of formal crossing facilities at all three junction arms. 30 metres long flares would be provided at the western and northern arms so that two approach lanes can be provided at each arm. The existing ghost island at the western arm (the R122) will be replaced by a channelising island to improve traffic safety and provide a refuge for pedestrians crossing the road. Tactile paving will be provided.

Notwithstanding the junction upgrade being permitted, the current application also includes the R122/ Boulevard Road Junction in the red line boundary and equivalent junction upgrades are being proposed as part thereof. Should the delivery of the Flemington Lane development not proceed, the upgrades will instead be implemented as part of the current proposed Ladywell Phase 4 development. The current proposed junction layout is presented in Section 11.6.6.

The permitted junction upgrade would result in enhanced capacity in addition to improved traffic safety. Given that the upgrade is permitted as part of the Flemington Lane development, it has been treated as committed and the traffic impact of the current proposed Ladywell Phase 4 has been assessed with respect to the upgraded rather than existing junction arrangements. The junction upgrade proposed as part of this application is equivalent to the one permitted as part of the Flemington Lane development, so that future capacity increase is ensured.

11.5.7 EXISTING TRAFFIC

Extensive traffic surveys have been carried out on Wednesday, 18 November 2018 by Nationwide Data Collection (NDC) to support the original Ladywell Phase 3 planning application and updated and supplemented for the purpose of the subsequent Phase 3B and 3C applications. The surveys undertaken at the time included, among others, the R122/ Boulevard Road Junction, with the traffic impact of the Phase 3 development on that junction being subsequently considered. Given that the current proposed development shall supplement and partially replace the original Phase 3 proposal, its impact in traffic terms has been considered based on the same dataset to enable a like-for-like comparison with the permitted development. The validity and robustness of traffic flows have been examined via supplemental peak period surveys undertaken during May 2024.

The recorded 12-hour traffic flows have been converted to Annual Average Daily Traffic (AADT) flows using the Transport Infrastructure Ireland Project Appraisal Guidelines Document *'Unit 16.1: Expansion Factors for Short Period Traffic Counts'.*

It is assumed that all impacts of those developments, which were identified as committed in the original Phase 3 documentation (produced in 2020), will have materialised by the current proposed development's year of opening 2025. Those developments included Taylor Hill Phases 1 and 2 residential development (which has since been completed) and expected growth in enrolment at local schools (which were found at the time to be operating below capacity. To further ensure consistency with the original Phase 3 TTA and the associated EIAR, the baseline AADT figures for the R122/ Boulevard Road Junction arms have been expanded by adding the flows expected to be generated by local schools and local committed residential development, as reported on in the original documents.

Table 11.2 outlines the AADT base flows (not including traffic flows from committed development) for 2018 (data year), 2025 (current proposed development's assumed year of opening) and 2040 (year of opening + 15 years), at the R122/ Boulevard Rd Junction.

Table 11.2: AADT Traffic Flows

Road	Base Background Flows			Additional Traffic due to Taylor Hill Dev and Increased School Enrolment (Veh)	Amended Background (Do Nothing) Flows (incl. Taylor Hill Dev and Increased School Enrolment)	
	2018 AADT (Veh)	2025 AADT (Veh)	2040 AADT (Veh)		2025 AADT (Veh)	2040 AADT (Veh)
Boulevard Rd	853	960	1,198	1,441	2,401	2,639
R122 W	13,718	15,512	18,915	1,620	17,132	20,535
R122 E	13,594	15,377	18,715	1,063	16,440	19,778

11.5.8 ACCESSIBILITY FOR CYCLISTS AND PEDESTRIANS

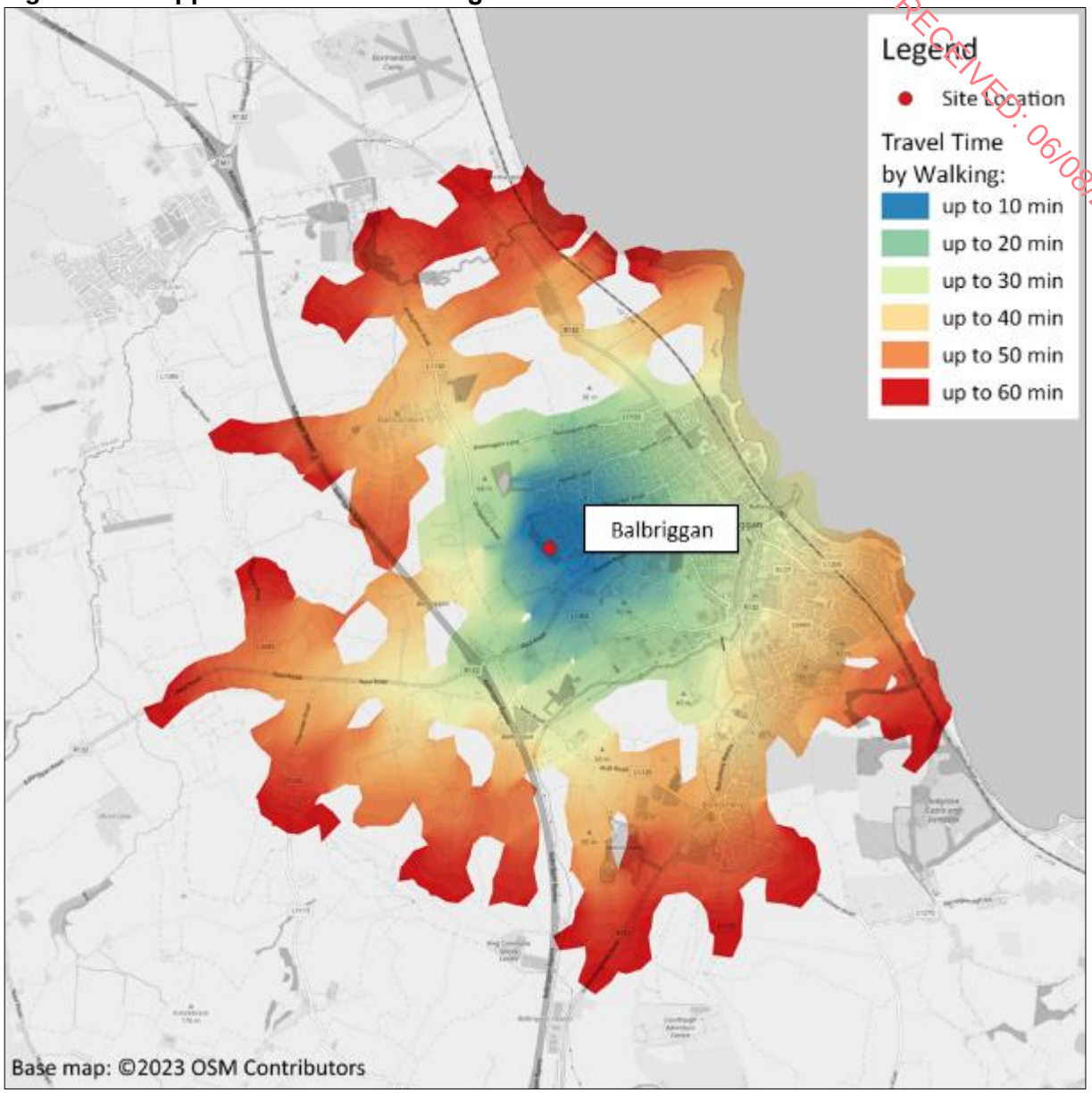
11.5.8.1 Existing Walking and Cycling Infrastructure

Footpaths are provided along most roads in urban Balbriggan, including the R122 and Boulevard Road in the application site's vicinity. However, footpaths are absent along the L1130, which forms the site's western boundary. Dedicated cycling infrastructure in the site's general vicinity includes segregated tracks provided at the R122 and Boulevard Road.

11.5.8.2 Site's Accessibility by Walking and Cycling

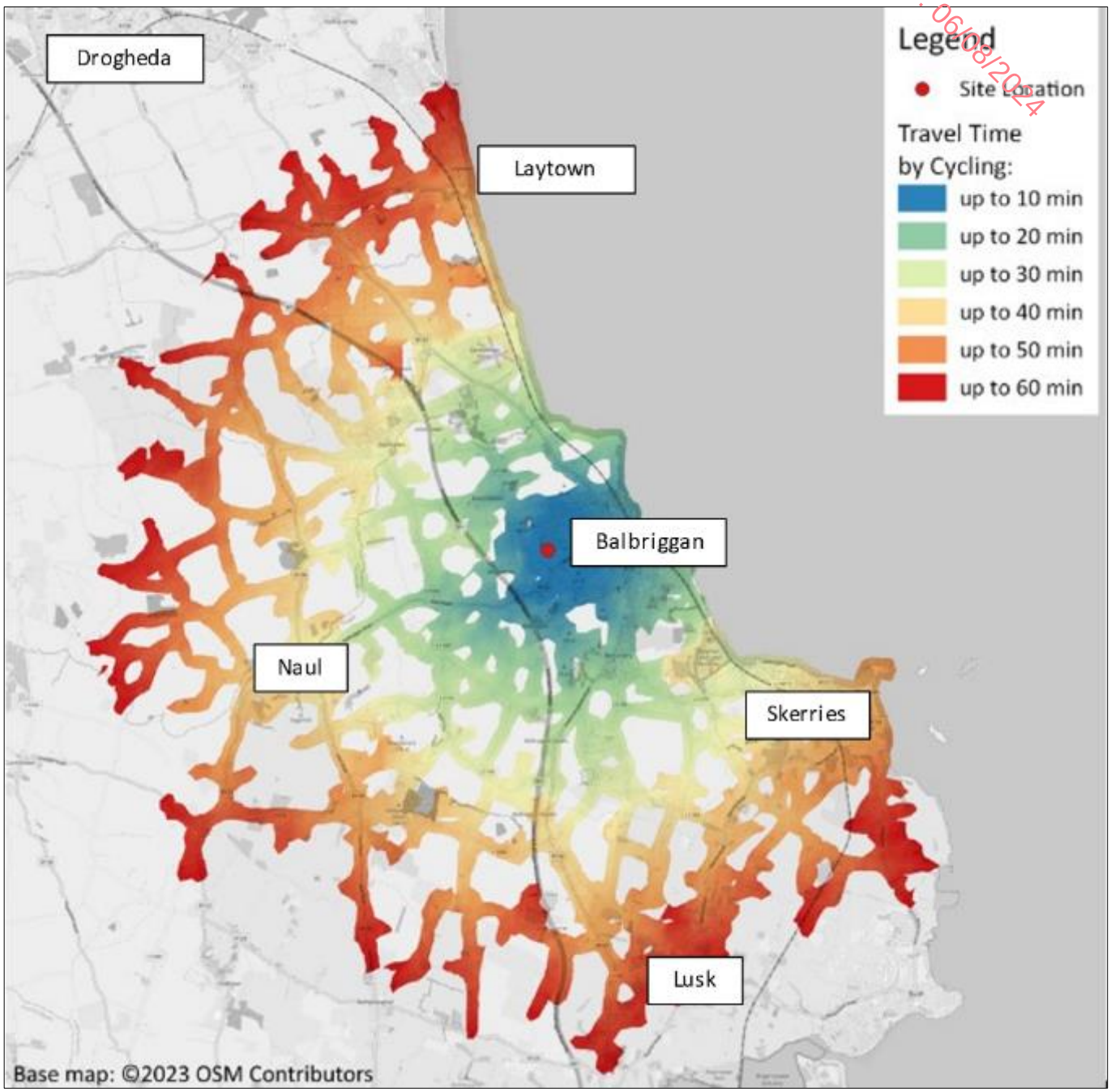
Figure 11.5 (below) presents the application site's accessibility by walking, showing travel time from various locations to the site. As can be seen from this figure, the site can be reached by walking from a variety of locations within Balbriggan, with the extent of the 45 minutes' isochrone reaching from Glebe Manor in the South, Newtown in the west and Bremore in the north. It is deemed that walking represents a viable option for those residing in Balbriggan.

Figure 11.5: Application Site's Walking Catchment



The following Figure 11.6 presents the application site's accessibility by cycling, showing travel time from various locations to the site.

Figure 11.6: Application Site's Cycling Catchment

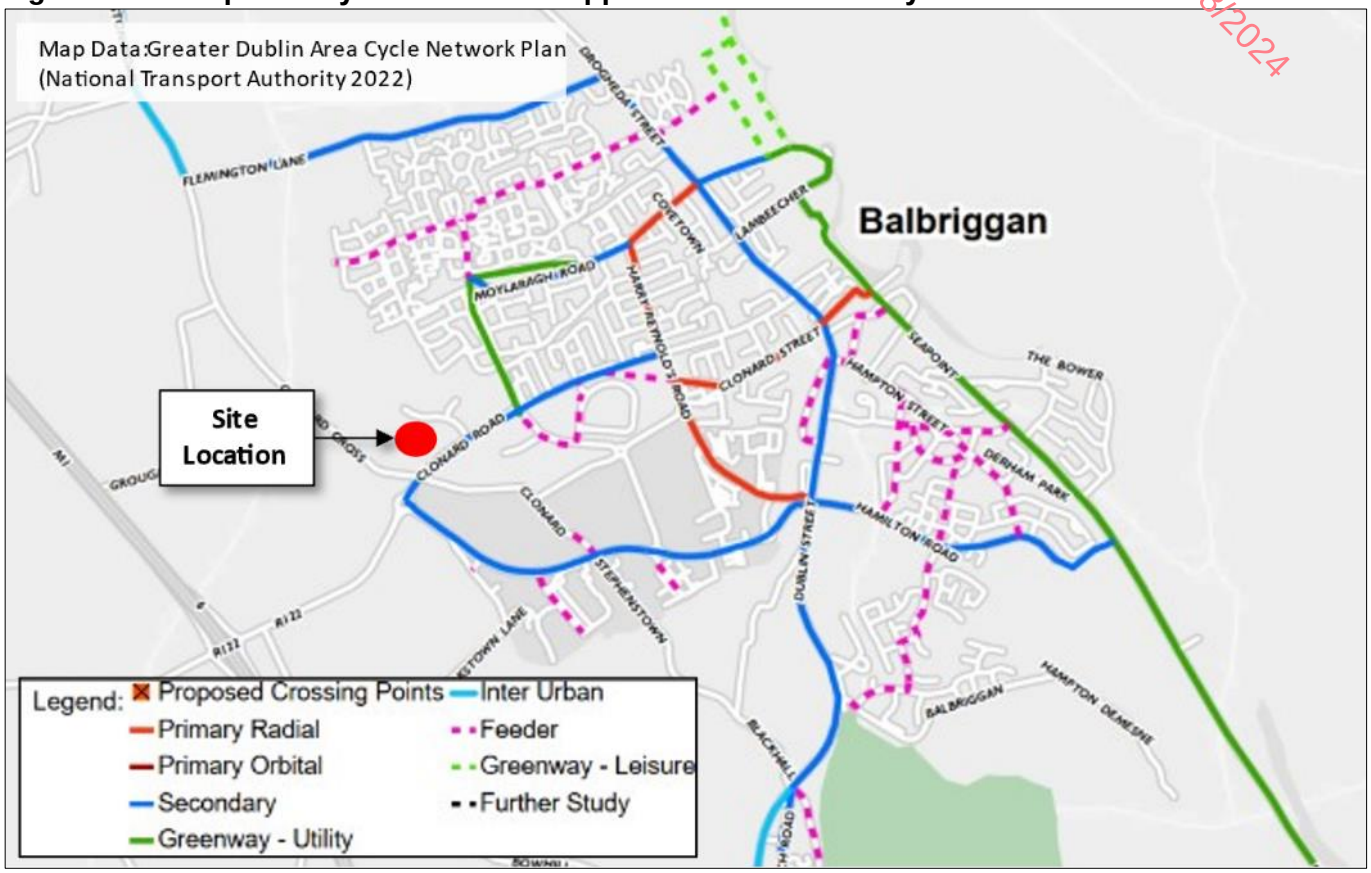


As can be seen in the preceding figure, the application site can be accessed within a 30-minute cycle from all parts of the Balbriggan. Distance-wise, cycling is also a viable alternative for trips to destinations including Skerries, Lusk and Naul.

11.5.8.3 Proposed Cycle Infrastructure Improvements

The planned layout of cycle infrastructure network within Dublin has been set out within the *Greater Dublin Area Cycle Network Plan*, published by the National Transport Authority in 2022. The proposed network in the application site's vicinity is illustrated in Figure 11.7, which follows.

Figure 11.7: Proposed Cycle Network in Application Site's Vicinity

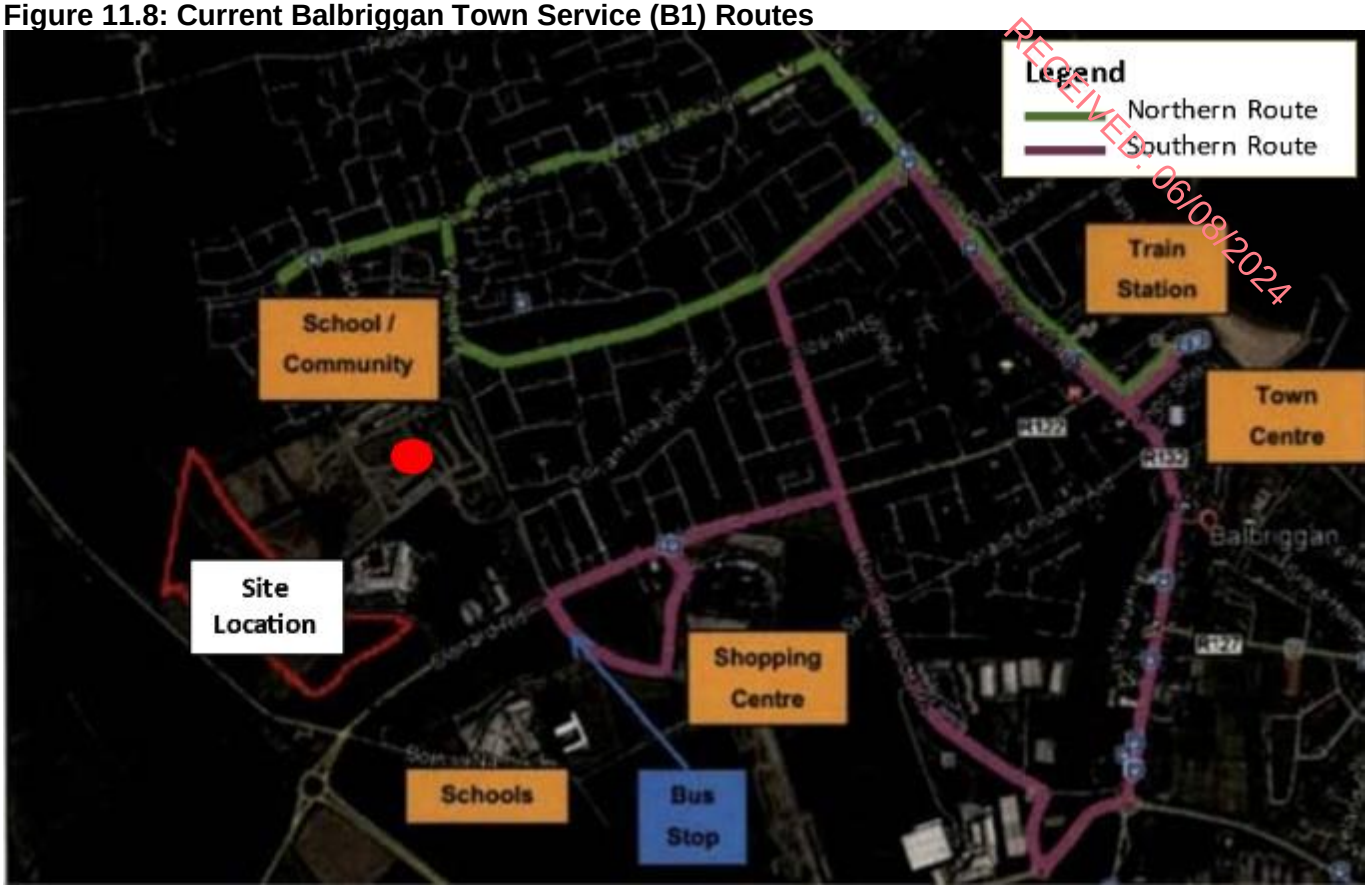


As shown within the preceding figure, the R122 has been classified as a secondary cycle link. Expansion of dedicated cycling facilities in Balbriggan shall enhance options for sustainable local mobility, with the planned interurban routes and coastal greenway enabling longer distance travel.

11.5.9 PUBLIC TRANSPORT ACCESSIBILITY

Bus services supplement the DART in serving Balbriggan, with the Balbriggan Town Service (B1) operated by Bus Eireann including two routes around the town, as shown in Figure 11.8 (below).

Figure 11.8: Current Balbriggan Town Service (B1) Routes



As shown in the figure, one route serves the northern and western parts of Balbriggan via Moylaragh Road and Hamlet Lane, whilst the second route serves the southern and western parts of the town via the R132, Harry Reynolds Road, and the R122. The closest bus stop is located immediately south of the R122/ Castlemill Road Junction, which is ca. 5 minutes' walk away from the southern part of the application site and ca. 15 minutes' walk away from its northern part. The stop is served by the southern B1 route every hour from ca. 08:30hrs to ca. 20:30hrs on weekdays and from ca. 10:30hrs to ca. 19:30hrs on Saturdays, with no services on Sundays.

Furthermore, a weekday, peak only commuter service 191 Express from Stadalt Cross in Stamullen to Marlborough Street in Dublin runs along the R122 adjacent to the application site's southern boundary, with 3 no. Dublin-bound morning services and 2 no. Balbriggan-bound evening services. The service is operated by Carolan Coaches and is available on the basis of commuter passes.

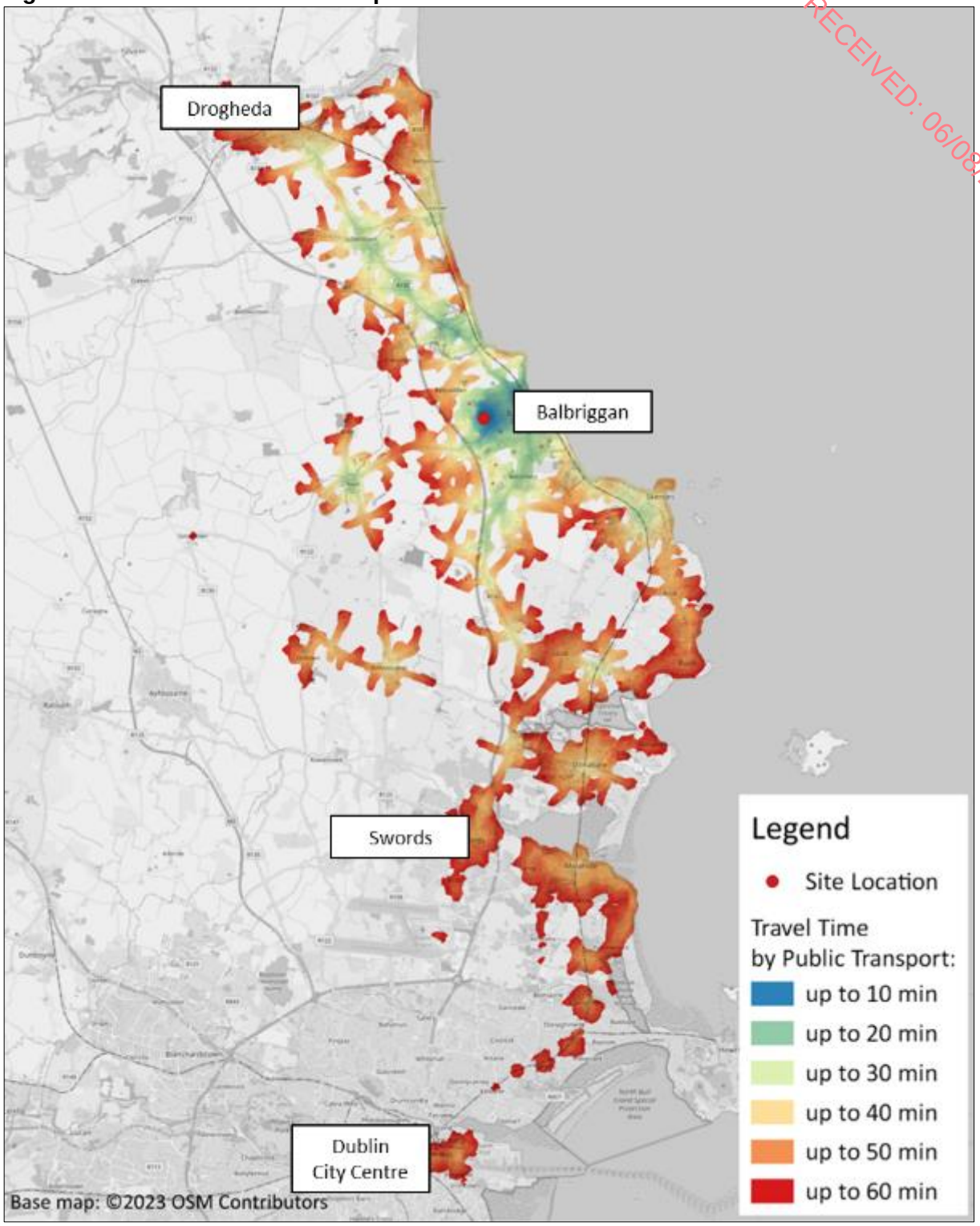
11.5.9.1 Rail Services

Balbriggan Railway Station is located ca. 2 kilometres (25 minutes' walk) to the east of the site. The station is served by Irish Rail Commuter services to/ from Dublin City, with ca. 30 services daily in each direction.

11.5.9.2 Site Accessibility by Public Transport

Figure 11.9 (overleaf) presents the application site's accessibility by public transport, showing travel time from various locations to the site. As can be seen from the figure, the available public transport services enable access across Balbriggan and to Drogheda, Swords and all towns along the coastal railway line in under 60 minutes. Central Dublin can also be accessed using the 191 service, albeit only in the morning peak, with returns in the evening peak.

Figure 11.9: Current Public Transport Travel Times



11.5.9.3 Proposed Public Transport Improvements

Balbriggan Urban Bus Service Improvements

It is understood that a new bus stop would be provided towards the northern end of Boulevard Road, close to the application site's northeastern corner.

Connecting Ireland

The bus network in north Fingal has been subject to review under the state-wide Connecting Ireland initiative developed by the National Transport Authority (NTA) with the aim of increasing connectivity, particularly for people living outside our major cities and towns. The plan aims to improve mobility in rural areas, and it will do this by providing better connections between villages and towns by linking these areas with an enhanced regional network connecting cities and regional centres nationwide. The planned bus network in the vicinity of Balbriggan is presented in Figure 11.10, which follows.

Figure 11.10: Future Public Transport Network

As can be seen in the preceding figure, the existing service 191 (Stamullen-Dublin via Balbriggan) shall in the future be supplemented by new service 192 (Balbriggan-Swords) and improved service 195 (Balbriggan-Ashbourne). Both services shall run at a frequency of between 3 and 6 return trips per day, depending on day of the week. It is understood that the services will serve stops located in Balbriggan Town Centre. It is unclear when the planned bus network improvements will be implemented

Dart+ Coastal North

The DART+ Coastal North Project rail improvement project will provide an extension of the existing electrified rail network from Malahide to Drogheda MacBride stations and will provide the infrastructure to facilitate an increase to the rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station and the replacement of existing commuter services with DART-branded services. Following project implementation, the number of peak time services Between Drogheda MacBride and Dublin Connolly should be increased from current 11 no. services to 24 no. services during the 3 hour AM peak period, resulting in increased attractiveness of public transport by increased capacity and reduced waiting times. The scheme's second round of non-statutory public consultation has concluded, with a Railway Order application to An Bord Pleanála was recently lodged.

11.5.10 ROAD SAFETY

The Road Safety Authority's database has been interrogated to identify the number of collisions/accidents that have occurred along the Clonard Road corridor to the west of the Castlemill Link Road. The database reveals that there have been no accidents at the Boulevard Road / Clonard Road junction (Junction 4).

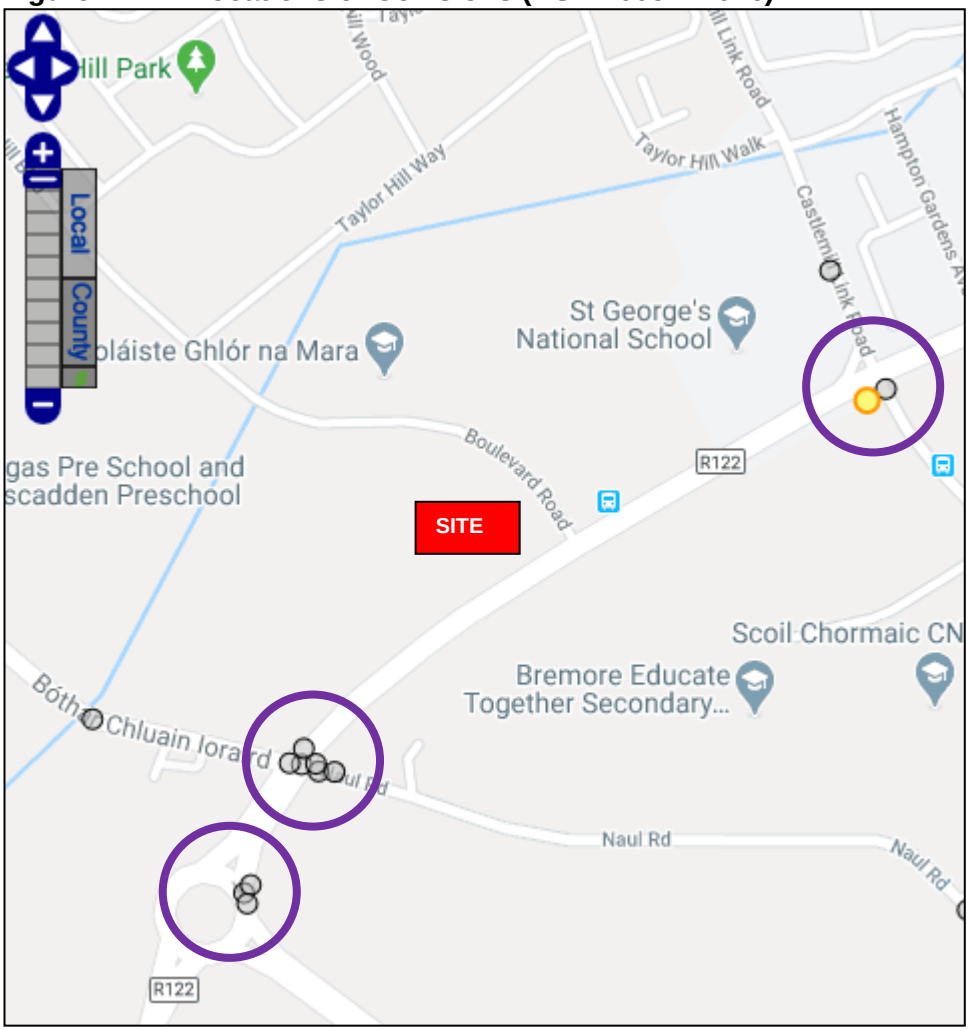
There have been two (2) accidents at Junction 5 (Castlemill Link Road) and further accidents at the Bridgefoot Road junction and Naul Road roundabout, as shown in Figure 11.11.

The two (2) accidents at the Castlemill Link Road junction resulted in slight or serious injuries. All injuries at the Bridgefoot Road and Naul Road roundabout resulted in slight injuries.

Overall, a total of 11 accidents have been recorded within the study area. Of these, ten (10) have been classified as 'minor' and only one accident has been classified as *'serious'*.

This is considered to be a low number of accidents over a 12-year period and demonstrates a good safety record on this part of the R122 (Clonard/Naul Road).

Figure 11.11: Locations of Collisions (RSA 2005 – 2016)



11.5.11 SHARED MOBILITY

Shared mobility services currently available in Balbriggan include 4 no. GoCar stations with 5 no. vehicles available in total. The station closest to the application site is located by the Millfield Shopping Centre, ca. 750 metres away from the site's southeastern corner. However, it should be noted that the eastern part of Balbriggan, including the application site, is currently mostly greenfield, with few sources of potential

demand for shared mobility services. The lands in question are currently undergoing rapid urbanisation, with the availability of car sharing services likely to follow completion of the residential schemes in vicinity.

11.6 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

11.6.1 DEVELOPMENT OVERVIEW

The draft proposed Phase 4 development is to comprise of 197 no. residential units with a minor ancillary commercial/ retail component, consisting of:

- 20 no. 1-bed units (incl. 12 no. maisonettes and 8 no. duplexes);
- 77 no. 2-bed units (incl. 4 no. apartments, 55 no. houses, and 18 no. later living units);
- 93 no. 3-bed units (incl. 8 no. duplex units and 85 no. houses);
- 7 no. 4-bed units (incl. 7 no. houses); and
- 350 sqm of ancillary commercial/ retail floorspace.

The proposed residential units will be accompanied by associated pedestrian, cycle, and car circulation and parking facilities (provided in accordance with appropriate Development Plan standards). Figure 11.12 (overleaf) illustrates the current proposed site layout, with a to-scale drawing included in the submission package. The figure provides an overview of the proposed new vehicular site accesses, routes of the internal streets and footpaths and the general location of the various housing types and associated car parking facilities.

It should be noted that Phase 4 development will, if completed, result in an increase in the total number of residential units across the Ladywell site from 306 no. (as per the Phase 3 Masterplan altered in accordance with the Phase 3B application [FCC Reg. Ref. F22A/0526]) to 434 no. units (a net increase of 128 no. units or 42%), while the ancillary local centre (i.e. commercial/ retail) component will be reduced from 540 sqm to 350 sqm.

A full description of the proposed development is set out in Chapter 2 of this EIAR.

Figure 11.12: Proposed Development – Site Layout*

*Image courtesy of Doran Cray Architecture (drawing no. A507-DCA-XX-XX-DR-A-009).

Due to the extent of the Ladywell site and the current proposed development being distributed between its different parts, the proposed development will include multiple access points for motorised vehicles and/ or active travel.

Vehicular access points can be summarised as follows:

- 1 no. direct access off Boulevard Road; and
- 2 no. indirect accesses off Boulevard Road via Phase 3 lands.

As detailed above, 2 no. new public road accesses will be created as part of the current proposed development. All of those accesses shall be via priority-controlled junctions. The proposed Phase 4 development road network will be fully integrated with the permitted Phase 3 roads with respect to road hierarchy and signage. As detailed above, Phase 4 shall to a significant degree rely on the public road accesses provided as part of the permitted Phase 3.

With regard to active travel permeability, the current proposed development shall be connected to footpaths and cycle tracks running along all adjacent roads, namely the R122, L1130, Boulevard Road, and the planned Balbriggan Ring Road. Filtered permeability will be applied in that the number of active

travel accesses will be higher than the number of vehicular accesses. Location of individual active travel access points can be examined in the site layout drawing, which forms part of this submission package.

11.6.2 SERVICING

Refuse collection vehicles are proposed to access/ egress the site using all vehicular accesses. Refuse collection truck routes will be planned to minimise turning movements, with waste bins being taken to designated collection locations prior to the waste contractor arriving.

A swept path analysis has been carried out in order to ensure that both refuse vehicles and emergency vehicles will be capable of accessing, circulating within and egressing the site. A set of swept path analysis drawings, prepared by Paul McGrail Consulting Engineers, has been included in the application package.

11.6.3 PEDESTRIAN FACILITIES

Pedestrian footpaths within the development are proposed as having a width of 2.0 metres. In addition, a 3.5 metres wide shared walking and cycling track across the southeastern part of the site, along the Clonard Stream, will be provided. The site features multiple active travel entrances from all sides to ensure high permeability.

11.6.4 CYCLING FACILITIES

As part of the proposed development, the following segregated cycling facilities will be provided:

- A one-way (southwest bound), off-street cycle track along the site's northwestern boundary (i.e. along the planned C-Ring Road);
- A one-way (southeast bound), off-street cycle track along the site's southwestern boundary (i.e. along the L1130); and
- A shared walking and cycling track across the southeastern part of the site, along the Clonard Stream.

Segregated cycle links will not be provided within the site, as this is not deemed required in the residential, traffic-calmed environment. It should be noted that the applicant does not control the lands to the north of the L1130 along the entire length of its section between the planned C-Ring Road and the R122, as two third-party dwellings are located between the applicant's land and the L1130. Due to this, it is not possible to provide a continuous cycle track along the entire road section. However, the internal road infrastructure within the site will allow a cyclist to travel between the C-Ring Road and the R122 using the traffic-calmed internal roads. The site features multiple active travel entrances from all sides to ensure high permeability.

11.6.5 PARKING ARRANGEMENTS

11.6.5.1 Cycle Parking

The proposed cycle parking provision has been designed to encourage cycling as a key mode of transport to and from the proposed development and reduce the reliance of residents and visitors on private car use. The current (2023-2029) *Fingal Development Plan* Standards, the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (July 2023), and the *Sustainable Residential Development and Compact Settlements Guidelines* (January 2024) have been consulted in order to determine a suitable amount of cycle parking to accommodate the proposed development.

To meet the resident and visitor cycle parking demand, all apartments (4 no.), duplex units (18 no.) and terraced units are provided with secure bike and bin stores which can accommodate 2 bicycles per unit. The remaining units, which have external rear garden access (including maisonettes), are not provided with dedicated cycle parking, as bikes can be stored within their private open space.

11.6.5.2 Car Parking

The proposed car parking provision has been designed to ensure balance the resident's mobility needs with the focus on alternative modes of transport, while being cognisant of the site's locational and accessibility characteristics. The current (2023-2029) *Fingal Development Plan* Standards, the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (July 2023), and the *Sustainable Residential Development and Compact Settlements Guidelines* (January 2024) have been consulted in order to determine a suitable amount of car parking to accommodate the proposed development.

Accordingly, and bearing in mind different needs of prospective dwellers, the proposed allocation of resident parking spaces relative to dwelling size is presented in Table 11.3, which follows.

Table 11.3: Proposed Car Parking Space Allocation

No. Units with Given Resident Parking Space Provision		No. Resident Car Parking Spaces Assigned to the Unit		
		0.5	1	2
No. Bedrooms in The Unit	1	0	20	0
	2	18	59	0
	3	0	39	54
	4	0	4	3

As can be seen in the preceding table, 1 no. parking space will be assigned to each 1-bedroom and 2-bedroom unit, except for the 18 no. later living units, where 1 no. space per 2 no. units will be provided. For larger units, 1 no. or 2 no. spaces per unit will be provided. In total, 245 no. resident car parking spaces will be provided

In addition to the above-summarised resident car parking spaces, a total of 35 no. additional parking spaces will be provided to serve the following purposes:

- 27 no. visitor parking spaces (incl. 2 no. wheelchair accessible spaces);
- 4 no. car club spaces; and
- 4 no. commercial unit parking spaces (1 per 88 no. sqm floor area).

The total car parking provision includes 280 no. spaces, which translates into 1.42 no. spaces per unit. Considering resident spaces only, a rate of 1.24 no. spaces per unit is proposed.

All of the proposed parking bays will be in the form of external surface parking spaces. Resident parking spaces will be located either in the individual unit's curtilage or, where the same is not practical, in groups of on-street spaces in proximity of the relevant units. Overall, 125 no. units will have one or two in-curtilage parking spaces and 54 no. units will have one or two assigned on-street parking spaces. A total of 9 no. on-street spaces will be assigned to the later living units. None of the units will have both an in-curtilage space and on-street space assigned. All resident parking spaces will be perpendicular.

In addition, 27 no. visitor car parking bays (1 no. per 7 no. dwellings) and 4 no. car club spaces will be provided, distributed across the site. Of the visitor spaces, 2 no. (ca. 7%) will be designed and marked as wheelchair accessible spaces, with appropriate buffers being provided. Finally, 4 no. parallel spaces in a lay-by in the northernmost part of the site will be provided to accommodate the needs of the on-site commercial units.

To enable EV charging, 80 no. of the car parking spaces across the site (i.e. 28% of all spaces) will be equipped with chargers. The remaining spaces will be equipped with ducting to enable future installation

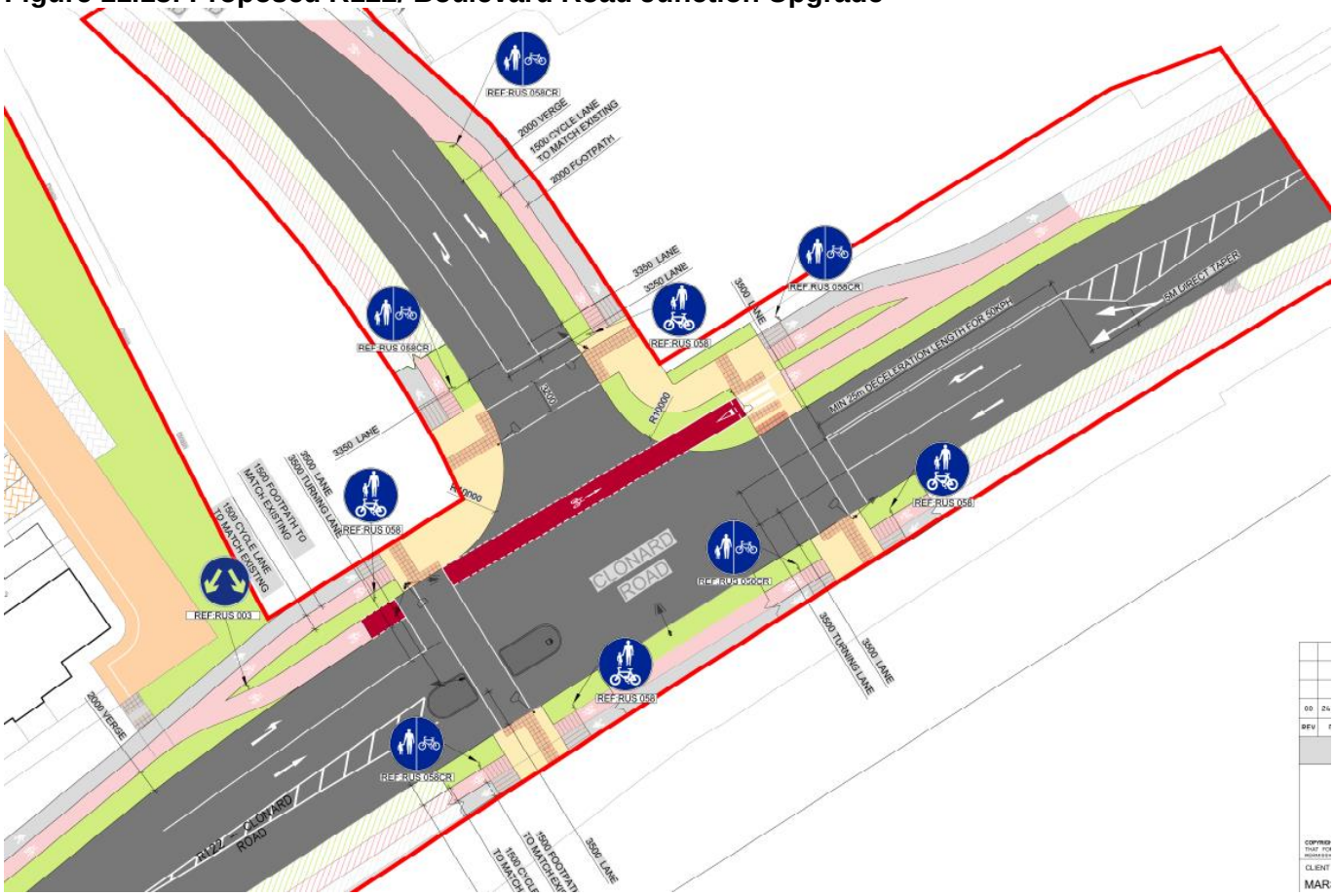
of charging points. The proposed charging infrastructure provision is noted to exceed the Fingal Development Plan requirements (with a minimum of 20% of spaces required to have a functioning EV charging point).

A car parking allocation plan is presented in Drawing A507-DCA-XX-XX-DR-A-029 in the application package.

11.6.6 R122/ BOULEVARD ROAD JUNCTION UPGRADE

As noted in Section 11.5.6.2, the permitted Flemington Lane development will involve an upgrade to the R122/ Boulevard Road Junction. Notwithstanding, the current application also includes a junction upgrade proposal. This is meant to ensure that the capacity and safety features of the junction support the delivery of the current proposal irrespective of whether the Flemington Lane development is delivered. The proposed junction layout is presented in Figure 11.13, which follows.

Figure 11.13: Proposed R122/ Boulevard Road Junction Upgrade



As can be seen in the preceding figure, the current proposed R122/ Boulevard Road Junction layout is broadly consistent with the one permitted as part of the Flemington Lane application, so that similar capacity can be achieved in both cases. The proposal includes widening of the western and northern approaches to provide two approach lanes at each junction arm. In addition, the junction is to be fully signalised, with formal pedestrian and cyclist facilities being provided throughout. The current proposed design is noted to have been guided by the Cycle Design Manual (NTA 2023). Details of the proposed layout can be reviewed in the drawing 2023-126-040194 included in the application package.

11.7 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

11.7.1 'DO-MINIMUM' TRAFFIC ESTIMATION

11.7.1.1 'Do-Minimum' Scenario Definition

The Do-Minimum scenario has been developed to reflect the realistic counterfactual conditions, wherein both the permitted development on the subject Ladywell lands (i.e. Phase 3A-D) and relevant committed third-party developments are completed. Delivery of such developments would likely cause growth in background traffic volumes on the road network in the Study Area, beyond that assumed in the Do-Nothing scenario. Accordingly, the traffic volumes forecast for the Do-Minimum scenario account for both the organic growth in background traffic and the trip generation by permitted development.

11.7.1.2 Relevant Committed Developments and Their Trip Generation

Ladywell Phase 3A-D

As noted elsewhere in this Chapter, the current proposed Ladywell Phase 4 development will partially replace and supplement the Phase 3 development. If completed, Phase 4 will result in an increase in the total number of residential units across the Ladywell site from 306 no. (as per the Phase 3 Masterplan altered in accordance with the permitted Phase 3B and 3C applications [FCC Reg. Refs. F22A/0526 and F22A/0670]) to 434 no. units (a net increase of 128 no. units or 42%). The proposed development's access arrangements are broadly consistent with and integrated into those of the permitted Phase 3, with vehicular movements to and from the site served via Boulevard Road and the R122/ Boulevard Road Junction.

Considering the above, it is reasonable to assume that should the current Phase 4 application not proceed, the Phase 3 development will instead be completed in accordance with the original masterplan, with potential minor amendments such as those arising from the permitted Phase 3B and Phase 3C applications (resulting in a reduction of the overall number of units from 328 no. to 306 no.). This would be reflected in the "Do-Minimum" scenario of the proposed development's transport impact assessment, which is presented herein.

The Traffic Impact Assessment produced in support of the original Phase 3 planning application has included a traffic generation forecast, with the expected daily number of vehicular trips associated with the intended development (including 328 no. units) estimated at 1,791 no. trips. The following Table 11.4 presents the estimated daily (AADT) traffic generation by the Phase 3 development, scaled down to reflect the reduced scale of development (306 no. units) at the R122/ Boulevard Road Junction.

It should be noted that the development traffic generation estimation approach applied to the Phase 3 and the proposed Phase 4 developments has been consistent, with details (including unit trip rates) presented herein in Section 11.7.3.1. Development traffic distribution assumptions have also been consistent and are detailed in Section 11.7.3.2.

Table 11.4: Ladywell Phase 3 Traffic at the R122/ Boulevard Rd Junction

Junction Arm	Development Traffic (AADT)
Boulevard Rd	1,742
R122 W	1,245
R122 E	496

Flemington Lane LRD

As noted in Section 11.5.3, a third-party residential development including 564 no. dwellings on the lands to the north of the current application site, referred to as the Flemington Lane development, has been granted permission by ABP. The Flemington Lane development proposal was supported by an EIAR, whose *Material Assets – Transport* Chapter (Chapter 12) has been prepared by Martin Peters Associates Consulting Engineers. In the Chapter, it has been assumed that prior to delivery of the entire C-Ring Road (i.e. from Flemington Lane all the way to the R122 Roundabout) all external vehicular traffic to and from

the Flemington Lane development would be served by the existing Boulevard Road and Hamlet Lane, expected to carry 80% and 20% of traffic respectively.

The following Table 11.5 presents the estimated daily (AADT) traffic generation by the proposed development at the R122/ Boulevard Road Junction, as per the original EIAR.

Table 11.5: Flemington Lane Development Traffic at the R122/ Boulevard Rd Junction

Junction Arm	Development Traffic (AADT)
Boulevard Rd	2,451
R122 W	1,753
R122 E	697

11.7.1.3 Do-Minimum Traffic Forecasting

As noted previously, in the Do-Minimum scenario the background traffic flows have been supplemented by the additional traffic generated by committed developments including the Ladywell Phase 3 and the Flemington Lane Development. Building upon the background traffic forecast presented in Section 11.5.7 and the relevant committed development's traffic generation estimates presented in Section 11.7.1.2, future traffic volumes at the R122/ Boulevard Rd Junction in the Do-Minimum scenario are presented in Table 11.6 which follows.

Table 11.6: Do-Minimum Traffic Flows

Road	Background (Do-Nothing) Flows		Do-Minimum Development Trip Generation (Veh)	Do-Minimum Flows	
	2025 AADT (Veh)	2040 AADT (Veh)		2025 AADT (Veh)	2040 AADT (Veh)
Boulevard Rd	2,401	2,639	4,193	6,594	6,832
R122 W	17,132	20,535	2,998	20,129	23,532
R122 E	16,440	19,778	1,193	17,633	20,971

11.7.2 CONSTRUCTION PHASE TRAFFIC IMPACT

The construction traffic impacts of Phase 4 are dependent on the capacity of the local road network to facilitate access to the site by the cars and vans associated with the workforce together with the HGVs and heavy construction machinery associated with the construction activities. The ability to accommodate temporary parking for contractors and storage of materials on site is another key consideration.

An Outline CTMP has been prepared by Transport Insights and is included as a section in the TTA and MMP Report. The Outline CTMP relies on information provided by Marshall Yards Development Limited and has been based on the following assumptions regarding the proposed development's key construction traffic related attributes:

- construction programme: up to 48 months (for completion of the overall Phase 3 and Phase 4 development).
- normal construction working hours:
  - Monday to Friday 07:00hrs to 19:00hrs; and
  - Saturday 07:00hrs to 14:00hrs.
- estimated staff numbers:
  - up to ca. 20 no. staff during the site set up phase;
  - up to ca. 40 no. staff during the setting out of sites and provision of services phase; and
  - up to ca. 150 no. staff during construction phase.
- estimated construction-related traffic generation:
  - 4 Heavy Goods Vehicle (HGV) arrivals and 4 HGV departures in each of the weekday peak activity hours during the excavation and concrete pour stages only;
  - 5 Light Goods Vehicle (LGV) arrivals and 5 LGV departures otherwise in each of the weekday peak activity hours,

- 40 car arrivals in the weekday AM peak hour, and
- 40 car departures in the weekday PM peak hour.

In the context of the proposed Phase 4 development's construction phase traffic impact, it should be noted that construction activities with similar intensity would be required for the delivery of Phase 3 development, as assumed in the Do-Minimum scenario. While the current proposed development is somewhat larger in scale, the corresponding increases in the number of construction-related trips per day or in duration of the construction period are expected to only be incremental. As such, no significant effects should occur.

11.7.3 OPERATIONAL PHASE TRAFFIC IMPACT

11.7.3.1 Trip Generation

Traffic generated by the proposed development during the critical peak periods has been estimated using the unit trip rates derived from the TRICS trip generation database and consistent with the Phase 3 TTA (and its subsequent revisions). A summary of predicted vehicular trip rates is presented in Table 11.7, which follows.

Table 11.7: TRICS Unit Vehicular Trip Rates per Land Use*

Item ID	Unit Type	All Day Two-Way
A	'Houses Privately Owned' (per dwelling)	6.294
B	'Flats Privately Owned' (per dwelling)	2.009
C	Duplex (per dwelling) average of A and B	4.152
D	'Shopping Centre – Local Shops' (per 100 sqm)	49.546
E	Local Centre (per 100 sqm) 20% of D	9.909

* - Trip rates as per Phase 3 TTA

The number of units per type proposed for the overall Ladywell landholding (which includes both the permitted Phase 3 and the current proposed Phase 4) is presented in the following Table 11.8. In the table, the original and amended Phase 3 proposals have been set against the current Phase 4 proposal.

Table 11.8: Ladywell Landholding Development Schedule

Unit Type	Current Phase 4 Proposal		
	Phase 3 (Retained)	Phase 4 (New)	Overall (P3 + P4)
Houses (no.)	211	147	358
Apartments incl. Later Living Units and Maisonettes (no.)	26	34	60
Duplexes (no.)	0	16	16
Total Dwellings (no.)	237	197	434
Local Centre (sqm)	-	350	350

As can be seen in the preceding table, it is proposed that the overall number of dwellings at Ladywell would increase from the originally permitted 328 no. to 434 no. (including both the retained units of the permitted Phase 3 and the newly proposed units at Phase 4), while the Local Centre component would be reduced from 540 sqm to 350 sqm of ancillary commercial/ retail floorspace. The following Table 11.9 sets out the forecast trip generation of the overall Ladywell development.

Table 11.9: Ladywell Lands Residential Component Vehicular Trip Generation

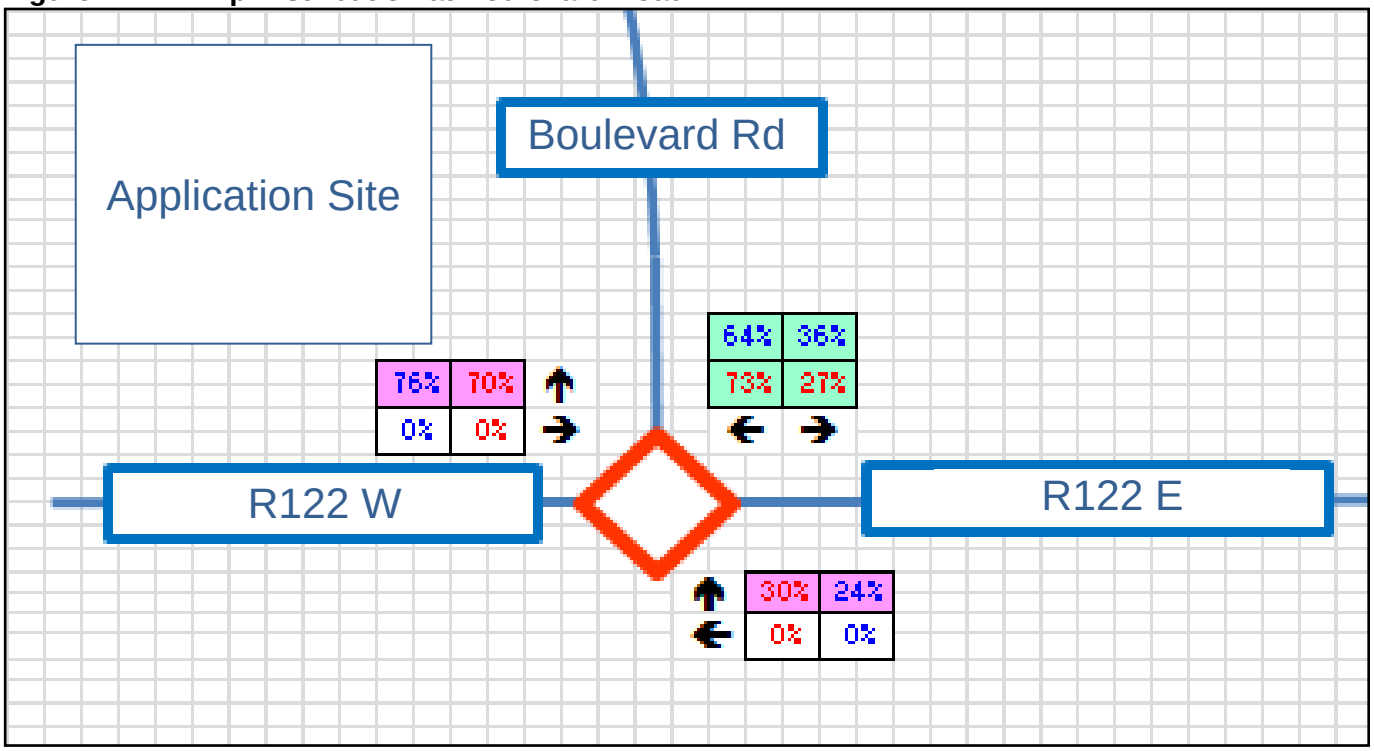
Development Proposal		All Day Two-Way
Current Phase 4 Proposal	Phase 3 (Retained)	1,380
	Phase 4 (New)	1,095
	Overall (P3 + P4)	2,475

As can be seen in the preceding table, delivery of the proposed Phase 4 (including changes to the permitted Phase 3) would result in all-day vehicular trip generation of the residential units at Ladywell to increase from ca. 1,742 no. to ca. 2,475 no. trips on an average day, compared to the previously permitted Phase 3.

11.7.3.2 Trip Distribution

The proposed development trips have been assigned on to the road network using the distribution surveyed at the R122/ Boulevard Road Junction in 2018, as shown in Figure 11.14.

Figure 11.14: Trip Distribution at Boulevard Road



The trips generated by the proposed development have been assigned on to the wider road network using the distributions identified in the traffic surveys.

11.7.3.3 R122/ Boulevard Rd Junction Traffic Impact

The following Table 11.10 presents the expected daily arm flows at the R122/ Boulevard Road junction in the Do-Minimum (i.e. with Ladywell Phase 3 and Flemington Lane LRD) and Do-Something (i.e. with Ladywell Phase 4 as currently proposed and Flemington Lane LRD) development scenarios. The outputs have been presented for the assumed Year of Opening (2025) and the Year of Opening + 15 Years (2040).

Table 11.10: Current Proposed Development Impact on the R122/ Boulevard Rd Junction Arm Flows

Arm	2025				2040			
	Background (Do-Nothing) Flows (Veh.)	Do-Minimum (Veh.)	Do-Something (Veh.)	DS vs DM (%)	Background (Do-Nothing) Flows (Veh.)	Do-Minimum (Veh.)	Do-Something (Veh.)	DS vs DM (%)
Boulevard Rd	2,401	6,594	7,293	10.6%	2,639	6,832	7,530	10.2%
R122 W	17,132	20,129	20,629	2.5%	20,535	23,532	24,031	2.1%
R122 E	16,440	17,633	17,832	1.1%	19,778	20,971	21,170	0.9%

As can be seen in the preceding table, the increased scale of development in the current proposal, compared to the permitted Phase 3, is expected to only result in a significant increase in traffic volumes on the Boulevard Road arm of the junction (i.e. the northern arm). The scale of increase in traffic volumes at that location is expected to be 10.2-10.6%. Conversely, the additional development-related vehicular trips will only increase the overall flows on the R122 West and R122 East arms by 2.1-2.5% and 0.9-1.1%, respectively.

Overall, the expected impact of the proposed development, relative to what is currently permitted, is deemed immaterial. Accordingly, the superseding of the previously planned (and partially permitted) Ladywell Phase 3 development by the currently proposed Phase 4 is deemed unlikely to result in a substantially more significant impact on the adjacent road network.

11.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

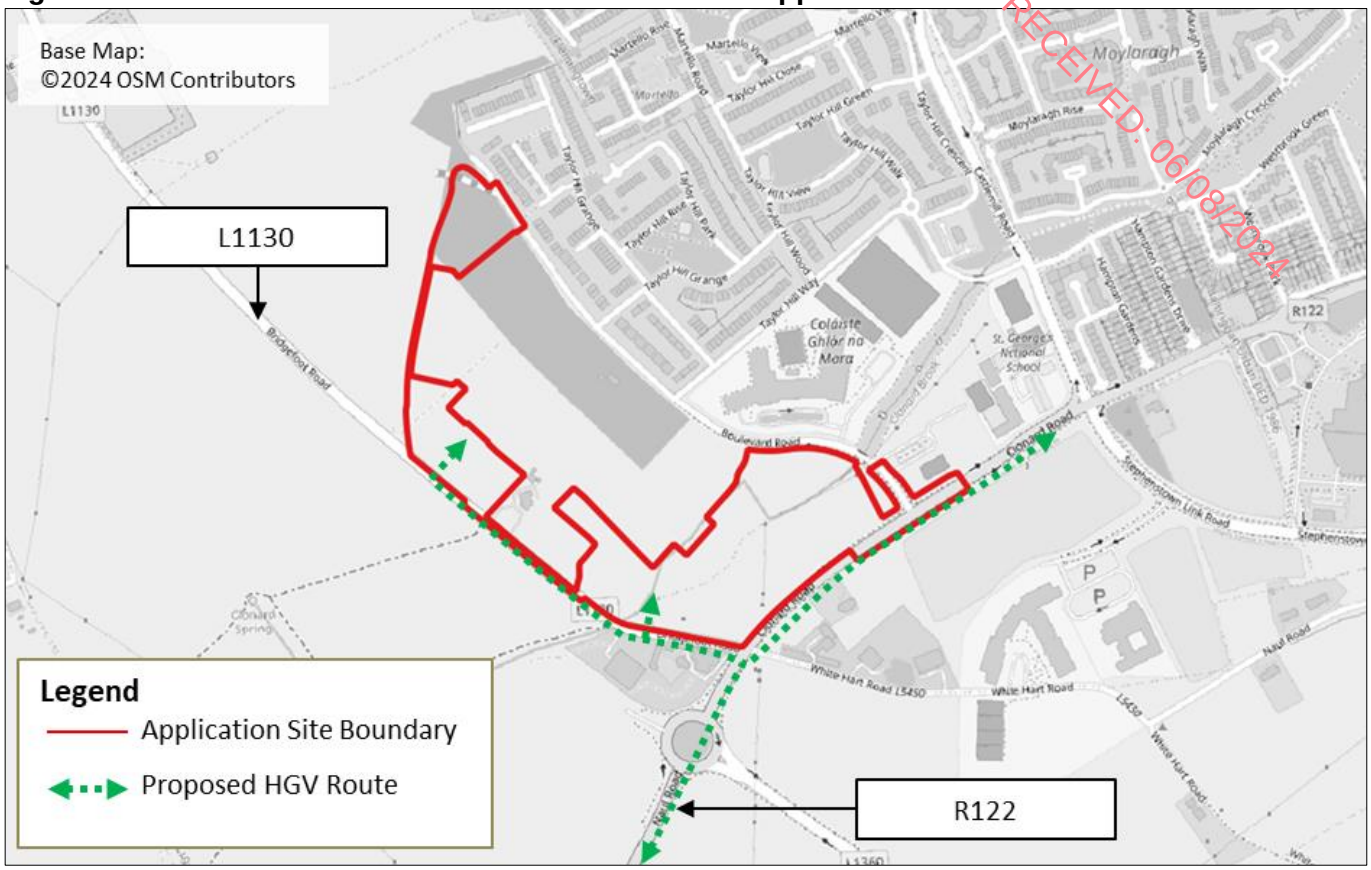
11.8.1 CONSTRUCTION PHASE

As noted in Section 11.7.2, an Outline Construction Management Plan (CTMP) has been prepared by Transport Insights and is included as a section in the TTA Report. The Outline CTMP addresses likely human health risks and documents construction practices and measures that can be adopted to minimise any effects on road users during the proposed development's construction phase. The Outline CTMP's overarching objectives are to:

- limit construction traffic impacts on nearby local roads by routing construction traffic along the regional and national road network, where possible;
- avoid conflict between construction traffic activities and general traffic/ pedestrians/ cyclists in the general vicinity of the site; and
- set out appropriate construction staff car parking arrangements so as to avoid overspill car parking on the local road network and resulting potential for traffic hazards.

In accordance with the CTMP, the set HGV haulage routes are to be strictly adhered to, as illustrated in the following Figure 11.15.

Figure 11.15: Construction Traffic Routes to/ from the Application Site



Furthermore, the following actions will be undertaken in accordance with the Outline CTMP:

- All construction staff parking will be accommodated in temporary parking areas within the site, which will have capacity for ca. 50 no. vehicles;
- A Construction Staff Mobility Management Plan (CSMMP) for the site will be developed by the contractor and implemented prior to construction works commencing;
- Just-in-time deliveries will be arranged where feasible;
- Construction materials will, where feasible, be sourced from local suppliers and manufactures, thus, minimising wider impacts of construction traffic;
- The site will operate from 07:00hrs to 19:00hrs on weekdays and from 07:00hrs to 14:00hrs on Saturday. No works will be undertaken on Sundays or Bank Holidays without the consent of FCC;
- A signage plan will be developed and implemented, providing advance warning of the construction access junction, and likelihood of slow-moving turning traffic to/ from the site. An outline signage plan is included in the outline CTMP;
- Compliance with the CTMP will form part of written contracts between the principal contractor and nominated sub-contractors
- Methods of handling materials on site will be in accordance with construction site health and safety requirements;
- Where required, construction vehicles will be inspected prior to exit from the site to ensure that dirt is not spread onto the adjoining road, and systems shall be put in place to facilitate this process, including an on-site cleaning area and/ or rumble grid; and
- The principal contractor will comply at all times with FCC requirements, including but not limited to hoarding/ scaffolding licences, skip licences etc; and
- The CTMP will be monitored constantly throughout the proposed construction programme and updated as needed to reflect the evolving needs of the project. The process for monitoring and updating the CTMP will be in accordance with FCC requirements

A detailed Construction Management Plan will be prepared post-planning by the selected construction contractor expanding on the outline plan, and the document will be submitted for approval to Fingal County Council Road prior to the commencement of any construction works. The CMP will include the mitigation contained in this EIAR including the CTMP.

The CTMP will ensure that suitable temporary traffic works, and road safety measures are put in place during the construction phase. The plan will ensure that any required traffic management measures are put in place to minimise the impact on local road users. Construction related traffic will access/ egress the site via the R122 and Boulevard Road. In general, the impact of the construction period will be temporary in nature and will cease following completion of the works. No significant effects are likely to occur due to construction phase traffic.

The applicant will appoint a dedicated construction manager and construction traffic manager. The construction traffic manager will be required to coordinate and schedule all deliveries to the site, ensure that the access roads are kept clear of mud and debris, advise haulage contractors on the appropriate routes to and from the site, and to adhere to good traffic management principles. In this way, the impacts of the construction phase can be appropriately managed. No significant effects are expected.

11.8.2 OPERATIONAL PHASE

Balbriggan provides suitable infrastructure and transport services to enable travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car.

To encourage sustainable transport use and help reduce potential traffic impacts, a Framework Mobility Management Plan (MMP) has been prepared by Transport Insights and is included as a section in the TTA and MMP Report.

11.8.2.1 MMP Objectives and Measures

Considering the site's accessible location, multiple employment and educational destinations within its walking, cycling, and public transport catchment and access to high-quality public transport services, the overarching objectives of the MMP are to:

- promote sustainable travel choices (walking, cycling and public transport); and
- support car-free lifestyle among residents and visitors of the development.

To achieve the mode share targets in the MMP, the following actions will be undertaken:

- Appointment of a Residential Travel Plan Co-Ordinator (MMPC)
- Promotion of the public transport TaxSaver scheme and Cycle to Work scheme
- Provision of secure cycle parking at a rate of 2 no. spaces per unit, where no direct external access to private open space is available
- Promotion of walking as active travel in residents Sustainable Transport Information Pack
- Incentivising Active Commuters

The Framework document sets out a clear set of objectives and identifies measures to help achieve the stated objectives, as well as appropriate monitoring and marketing techniques. Following occupation of the site and appointment of an MMPC, it is recommended that the Action Plan included in the MMP be further developed. The Action Plan will remain a 'living' document thereafter and should be updated periodically.

11.9 POTENTIAL CUMULATIVE IMPACTS

11.9.1 IDENTIFIED RELEVANT COMMITTED DEVELOPMENTS

With the objective of assessing the cumulative impacts the potential traffic that could arise from committed development schemes in the local area in addition to growth factors applied to base traffic flows have been incorporated into the analysis in Section 10.6.2. Such approach ensures the cumulative impact of potential additional vehicular movements as a result of the implementation of both the subject proposals and the committed development have been considered in the junction performance analysis.

A total of 6 no. committed and proposed developments have been identified within the application site's wider environs, that could potentially generate an impact upon the local road network beyond that captured by the future background traffic growth assumptions. The identified developments are presented in Table 11.11 (below), with commentary provided regarding their consideration in this EIAR chapter.

Table 11.11: Relevant Committed and Proposed Developments

No.	Reg. Ref.	Name	Location	Comments
1	ABP-312048-21 (F21A/0055)	Phase 3A Ladywell	Lands to the east	As the current proposed development will augment and partially replace those previously permitted, any cumulative impacts have been reflected in the analysis presented in this chapter.
2	F22A/0526	Phase 3B Ladywell	Lands to the east	
3	F22A/0670	Phase 3C Ladywell	Lands to the east	
4	LRD0006/S3	Flemington Ln	Lands to the north	The recently permitted scheme has been accounted for in the Do-Minimum development scenario, and as such any cumulative impacts have been reflected in the analysis presented in this chapter.
5	F22A/0033	Harvest Lodge Distillery	Lands to the south	The application for construction of a distillery with a total floor area of 5,659 sqm has been granted permission by FCC, however due to its relatively minor scale and its location on the existing section of Balbriggan Ring Road it is not expected to give rise to measurable cumulative impacts in terms of traffic and transport beyond those captured by the future background traffic growth assumptions.
6	F22A/0480	Stephenstown Ind. Est. Warehousing Unit	Lands to the south	the application for construction of a warehouse unit with ancillary uses with a total floor area of 2,496 sqm has been granted permission by FCC. Given the minor scale of the proposed development and its location ca. 1.3 kilometres from the current application site, it is not expected to give rise to measurable cumulative impacts beyond those captured by the future background traffic growth assumptions.

As presented in the table above, the Flemington Lane residential scheme (item 4, detailed in Section 11.5.3) has been deemed to generate excess traffic beyond the assumed background traffic growth factors, and therefore it has been individually accounted for in the analysis included herein. The remaining identified third-party developments will not give rise to measurable cumulative impacts.

11.9.2 CONSTRUCTION PHASE

It has been deemed likely that the construction of the Flemington Lane development will coincide with the delivery of the current proposed Ladywell Phase 4 scheme, resulting in a cumulative impact of the construction-related traffic. The construction phase impacts of the Flemington Lane development have been identified in a CTMP prepared by MPA Consulting Engineers. While the current proposed development's construction phase traffic impacts have been described in Section 11.7.2, the Flemington Lane scheme's attributes are summarised below:

- Approximately 40 HGV arrivals and 40 HGV departures each day for the first two to three months (initial site stripping and site establishment works);
- Approximately 10-15 HGV arrivals and departures each day during the main construction phase.
- Approximately 80 car/ van arrivals in the weekday AM peak hour and departures in the weekday PM peak hour.
- HGV deliveries will be scheduled to avoid the peak hours.
- Construction personnel are estimated to generate in the order of 80 car / van arrivals at the start of the working day and approximately 80 car / van departures at the end of the working day. Additional movements may occur during lunch breaks.

Overall, the Flemington Lane construction traffic volumes are expected to be somewhat larger compared those of the Ladywell development (either Phase 3 as permitted or Phase 4 as currently proposed). With the Flemington Lane development expected to generate ca. 240 no. one-way vehicular (light or heavy vehicle) trips during peak activity days, a consecutive construction of both schemes could generate in the range of 400 no. one-way vehicular trips per day (during the most intensive construction periods). Most or all of the access and egress trips would be carried by the R122. Considering that the R122 is expected to carry ca. 17,000 vehicles per day (AADT) in the Do-Nothing scenario (i.e. without any new development at either Ladywell or Flemington Lane), the development traffic will increase the baseline traffic volumes by ca. 2.4%. This increase is not deemed material and as such no significant cumulative effects during the construction phase are expected.

11.9.3 OPERATING PHASE

The cumulative impact of the Flemington Lane residential scheme and the proposed Ladywell Phase 4 has been considered in the assessment described in Section 11.7.3.

11.10 MONITORING

11.10.1 CONSTRUCTION PHASE

During the construction stage the following monitoring exercises will be carried out. The specific compliance exercises to be undertaken in regard to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and external road conditions, and
- Timings of construction activities.

The CTMP will be monitored constantly throughout the proposed construction programme and updated as needed to reflect the evolving needs of the project. The process for monitoring and updating the CTMP will be in accordance with FCC requirements.

11.10.2 OPERATIONAL PHASE

It is important to monitor and update the MMP to ensure the actions are being implemented and that action is sustained over time. It also provides an opportunity for the effectiveness of actions to be assessed, and if required, new actions identified. The following steps are recommended to monitor progress:

- Informed by a residents and visitors travel survey, the MMP should be updated within 3 months of site occupation; and the Action Plan tailored to meet the specific requirements of its residents and visitors.

- A resident and visitor travel survey should be carried out annually thereafter, forming the baseline from which the MMP's future performance is measured, and additional/ amended interventions identified.
- A review of the actions carried out or due should be carried out by the MMPC every six months. This should take the form of a memo to the scheme's management company, documenting actions implemented, residents' feedback etc.

11.11 REINSTATEMENT

Any works on public property will be carried out with the minimum of inconvenience to the public and shall be reinstated in accordance with the requirements of Fingal County Council.

11.12 INTERACTIONS

The analysis contained within this chapter interacts with the climate, local air quality, and noise impact assessments contained within this EIAR, in addition to the population and human health chapter. This is primarily due to the potential for an increase in traffic movements on the surrounding road network due to development.

11.12.1 ACCIDENTS & DISASTERS

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. Measures will be put in place to assess the risk of road traffic accidents during the construction phase. Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used and no unusual substance or underground tunnelling works required or predicted.

During the operational phase, it is anticipated that the risk of accidents will be influenced by the additional traffic generated by the proposed development. The potential likelihood of any incidents and the severity of such incidents is minimised due to the appropriate segregation of vulnerable road users through the development as a result of the new dedicated infrastructure proposals the design of which advocates self-regulating low speed streets through the implementation of horizontal and vertical deflection and dedicated pedestrian / cycle linkages.

11.12.2 Noise and Vibration

The influence of traffic upon noise and vibration is considered in an earlier section of this EIAR.

11.12.3 Air Quality and Climate

The influence of traffic upon air quality and climate is considered in an earlier section of this EIAR.

11.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no material difficulties encountered in compiling and assessing the data for this EIAR Chapter sufficient to prevent modelling of the likely transportation effects of the proposed development and all other information required for the compilation of this Chapter being accessible.

11.14 REFERENCES

- Traffic & Transport Assessment Report (ref 191034-TTA01), prepared by MPA Consulting Engineers, dated 18 January 2021;
- Technical Note 04 – 2040 Junction Assessments (ref 191034-TN04); prepared by MPA Consulting Engineers, dated 30 June 2021;
- Traffic & Transport Statement (ref 191034-TTS01); prepared by MPA Consulting Engineers, dated 26 August 2022;
- Traffic & Transport Assessment and Mobility Management Plan (ref C1041 2023) prepared by Transport Insights, v1.10 dated 12 June 2024;
- Environmental Impact Assessment Report, Chapter 12: Material Assets – Transport, prepared by MPA Consulting Engineers, dated July 2023 (entire EIAR Report);
- Traffic and Transport Assessment Report (ref 191004-TTA01); prepared by MPA Consulting Engineers, dated 23 September 2021;
- and Traffic and Transport Assessment Update Report (ref 191004-TTA02); prepared by MPA Consulting Engineers, dated 30 June 2023;
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017);
- Sustainable Urban Housing: Design Standards for New Apartments (July 2023);
- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (January 2024)
- Fingal Development Plan 2023-2029;
- Transport Infrastructure Ireland (TII) (2014) Traffic and Transport Assessment Guidelines;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts (October 2016);
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021); and
- Design Manual for Urban Roads and Streets (DMURS) (May 2019).

12.0 MATERIAL ASSETS: SERVICES, INFRASTRUCTURE AND UTILITIES

12.1 INTRODUCTION

This Material Assets chapter relating to Services, Infrastructure and Utilities of the EIAR has been prepared by Paul Mc Grail Consulting Engineers.

Resources that are valued and that are intrinsic to specific places are called "*material assets*". They may be either of human or natural origin and the value may arise for either economic or cultural reasons.

This chapter is intended to deal with the physical resources in the environment which may be of either human or natural origin. The objective of the assessment is to ensure that these assets are used in a sustainable manner, so that they are available for future generations, after the delivery of the proposed development. This chapter comprises an assessment of the likely impact of the proposed development on existing surface water, water supply, foul drainage, and utility services in the vicinity of the site as well as identifying proposed mitigation measure to minimise any impacts.

The material assets considered in this chapter of the EIAR include Surface Water Drainage, Foul Drainage, Water Supply, Power, Gas, Telecommunications and Waste. This Chapter should be read in conjunction with all relevant chapters of the EIAR.

12.1.1 AUTHOR INFORMATION AND COMPETENCY

This Chapter has been prepared by Paul McGrail, Managing Director of Paul McGrail Consulting Engineers, graduated from Bolton Street DIT in 1999. He worked for various Consulting Engineers on a variety of projects from Residential, Commercial, Food Industry and Conservation projects prior to setting up practice in 2009. Paul is a Chartered Engineer with Engineers Ireland and has completed two post grad courses in Project Management and Conservation in Trinity.

12.1.2 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development subject of this application relates to Phase 4 of residential development at Balbriggan Co Dublin. The proposed development comprises the construction of the following:

The proposed development consists of 197 no residential units, 2no. commercial unit, upgrade of the junction at Boulevard Road.

12.1.3 METHODOLOGY

The methodology used to prepare this section of the EIAR is in accordance with the EPA "*Guidelines on the information to be contained in Environmental Impact Assessment Report May 2022*" and EPA *"Draft Advice notes for preparing environmental Impact Statements September 2015".*

These draft guidelines include information on the assessment of the effects of development on material assets and advises on the nature of the material assets which should be examined as part of the preparation of an EIAR.

The following sources have been used to collate information on built services within the general area of the site.

- Public Foul Drainage and Water Network system operated by Uisce Eireann
- Review of Uisce Eireann utility plans (, foul drainage and water supply).
- Review of Existing as built drawings.
- Submission of a Pre-Connection Enquiry Application to Irish Water.

- Review of ESB Networks Utility Plans.
- Review of Gas Networks Ireland Service Plans.
- Review of Eircom E-Maps.
- Review of Virgin Media Maps.

The information above has been supplemented by site inspections and surveys.

The information above has been supplemented by site inspections and surveys carried out as part of the construction of phase 1.

The foul and watermain design for the proposed development has been reviewed by Uisce Eireann and a "Statement of Design Acceptance" has been issued by Irish water. The surface water design has been reviewed by Fingal County Council and any comments made have incorporated in the current design.

The following documents have been used in the design if the foul, watermain and surface water:

- Code of Practice for Wastewater Infrastructure (IW CDS 5030-03, 2017)
- Code of Practice for Water Infrastructure (IW CDS 5020-03, 2017)
- Sewers for adoption 7th Edition (September 2013)
- CIRIA C753 The SUDS Manual (November 2015)
- Greater Dublin Strategic Drainage Study (2005)

12.1.4 DIFFICULTIES ENCOUNTERED

The exact location of the existing infrastructure is reliant upon the records obtained from the relevant service providers. Overall, no difficulties were encountered in preparing this chapter of the EIAR.

12.2 DESCRIPTION OF THE EXISTING ENVIRONMENT (BASELINE SCENARIO)

The site of the proposed development is currently a greenfield site. The land bounded to the East and north (partially) by phase 3 under construction and to the west by the Clonard Road.

Ownership and Access

The subject lands are owned by the applicant, Marshall Yards Development Company Limited Ltd.
Vehicular access and egress to and from the application site will be provided via the existing Boulevard Road.

12.2.1 SURFACE WATER DRAINAGE

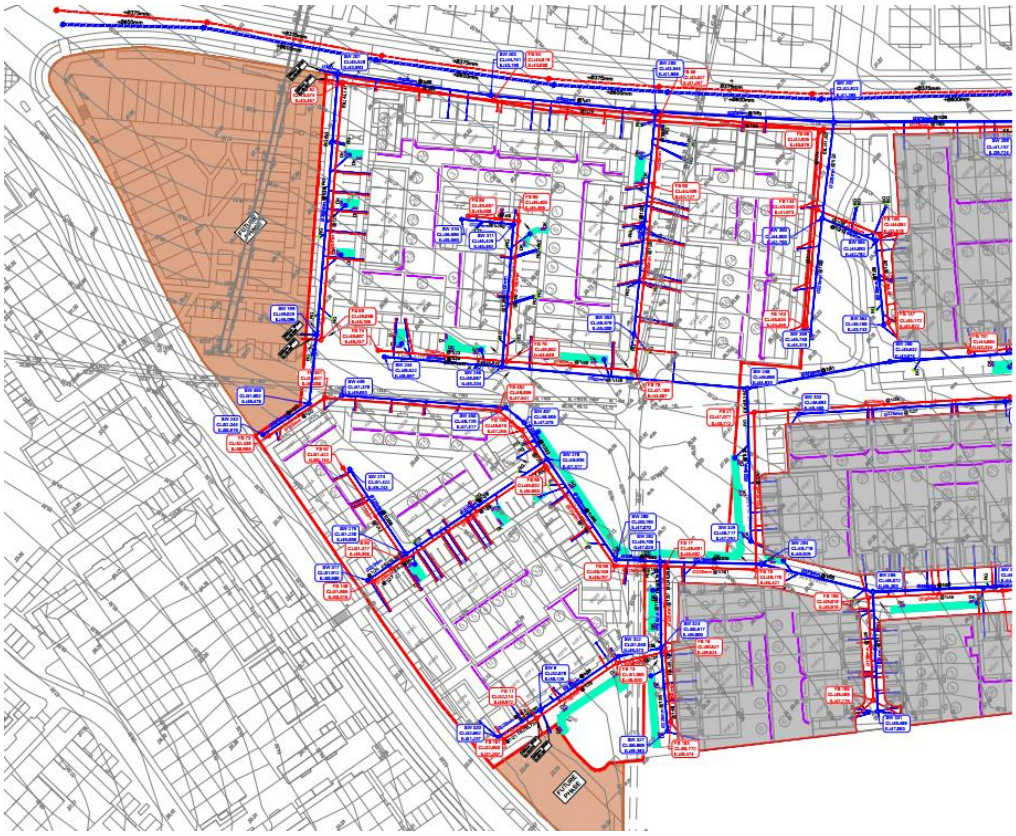
There is no existing surface water network with the existing site. It is evident that existing rainwater drainage from the site is by means of direct infiltration and percolation into the existing agricultural ground.

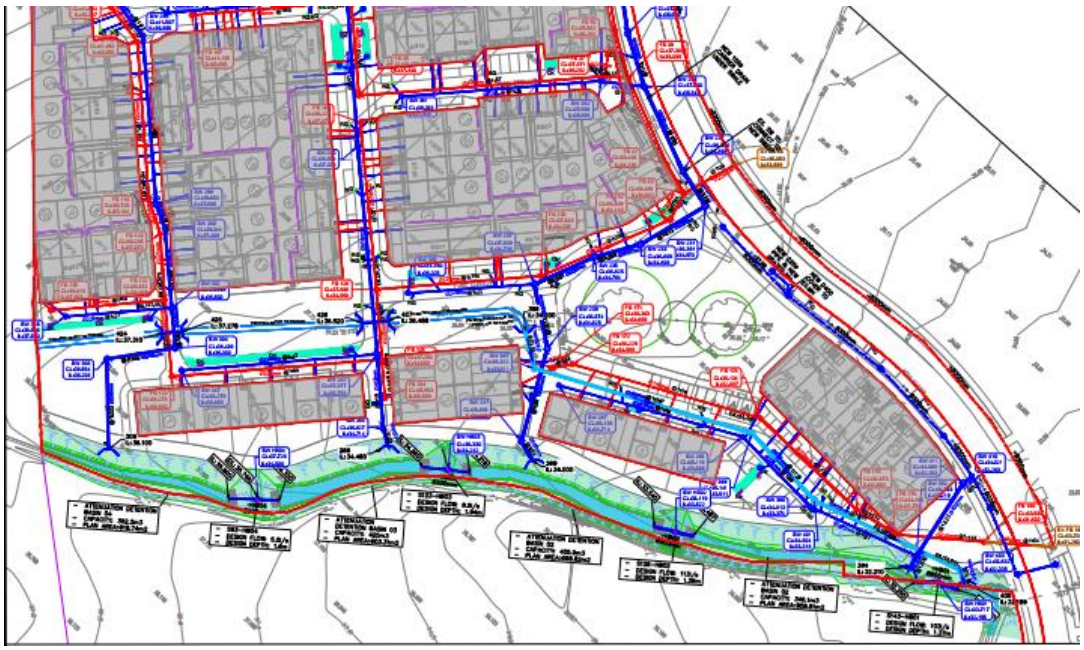
The local groundwater flow direction is likely to mirror the site topography and catchment drainage.
The greenfield run off from the site travel in a Southern direction.

It is proposed to discharge surface water from the site to the existing surface water field drain which then discharges to the existing Fingal County Council surface water network.

The entire development will be constructed as one phase which is under the ownership of the applicant. The current site will be one catchment areas and will be attenuated to reflect the greenfield run off rate.

Figure 12.1: Existing Records of Storm Water Drainage South of proposed site.



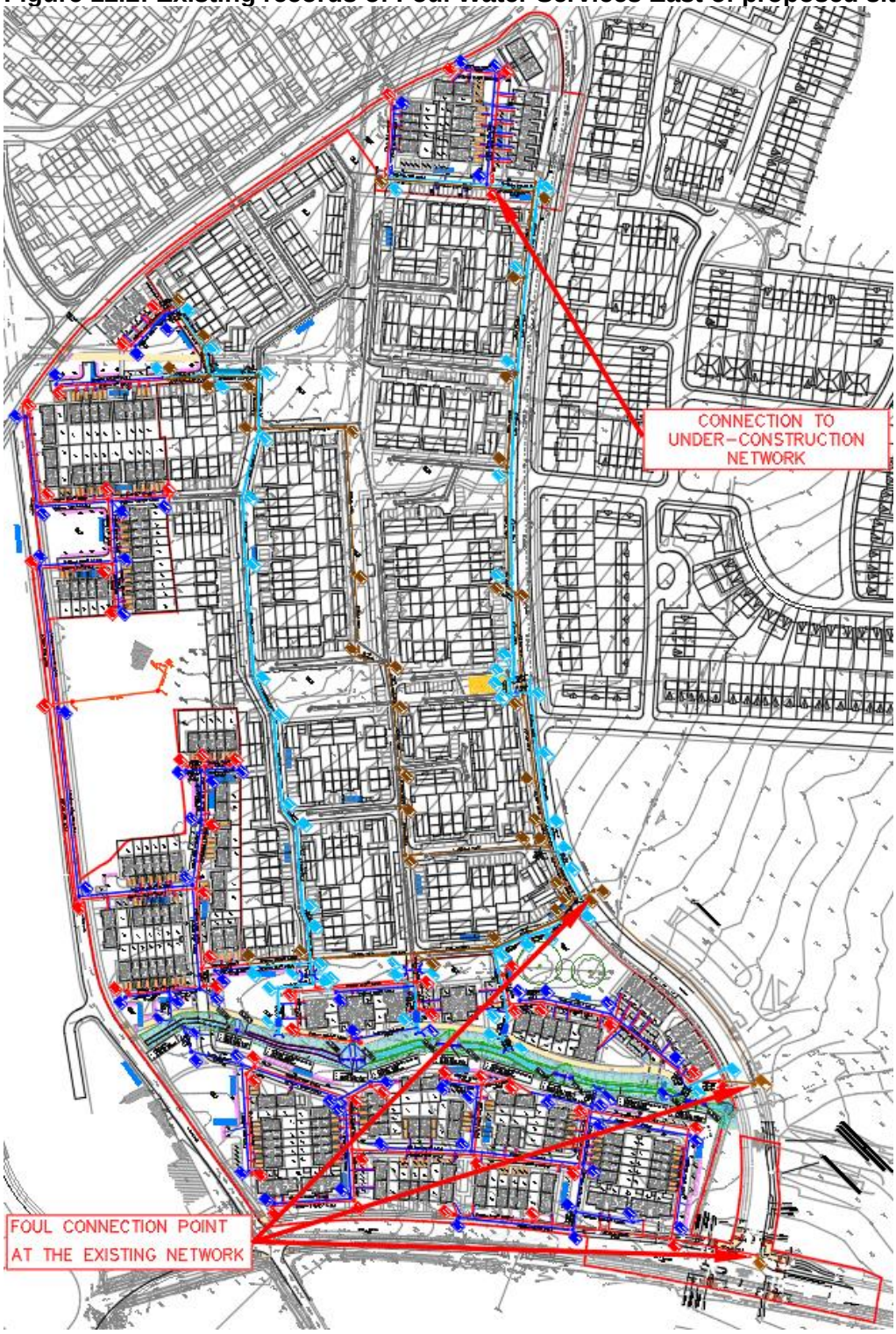


12.2.2 FOUL WATER DESIGN

There are no records or evidence of any foul water infrastructure within the proposed site. Refer to Figure 12.6 below shows the existing foul network around of the proposed development.

The proposed foul sewer network will connect to the proposed foul sewer pumping station located at the southern boundary which will discharge to the existing Uisce Eireann Foul Sewer Network.

Figure 12.2: Existing records of Foul Water Services East of proposed site.



12.2.3 WATERMAIN DESIGN

There are no records or evidence of any existing watermain pipeline located within the proposed site. Refer to Figure 12.3 below for the existing watermain around the proposed development.

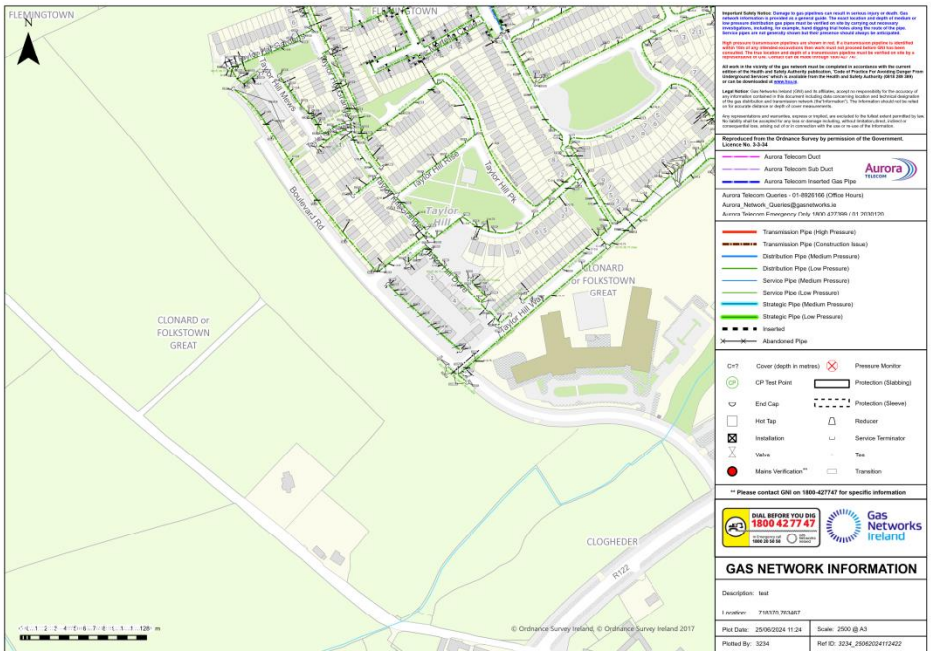
Figure 12.3 Existing records of Watermain Services East of proposed site.

12.2.4 NATURAL GAS

There is no existing gas pipeline located on the subject site but a large High-Pressure main is located along the proposed development. Refer to Figure 12.4 below for the existing Gas Main Network.

No connections to the natural gas network will be required.

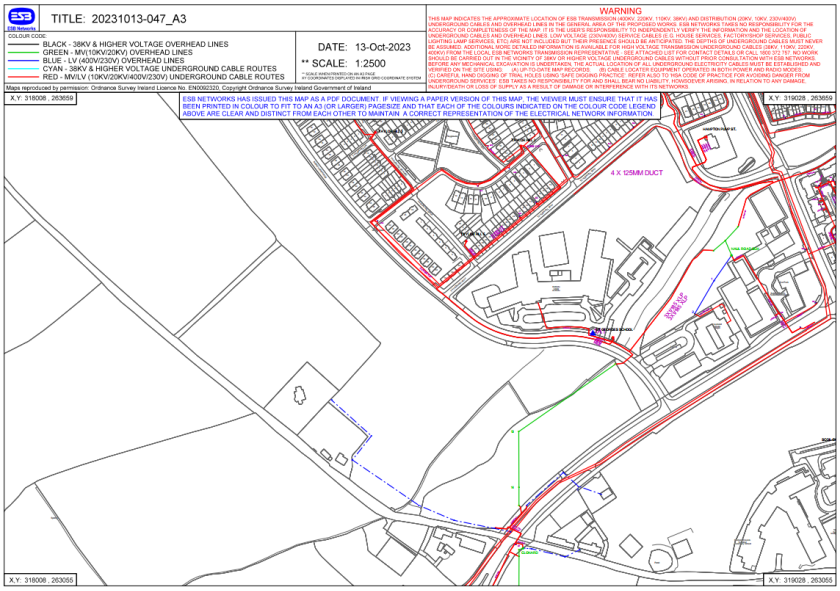
Figure 12.4: Existing Gas Main Network



12.2.5 ELECTRICITY SUPPLY

A new substation will be provided to serve this development. The proposed substation will provide power to a few mini pillars which will provide power to the residential dwellings. Refer to Figure 12.5 below for the existing records of ESB.

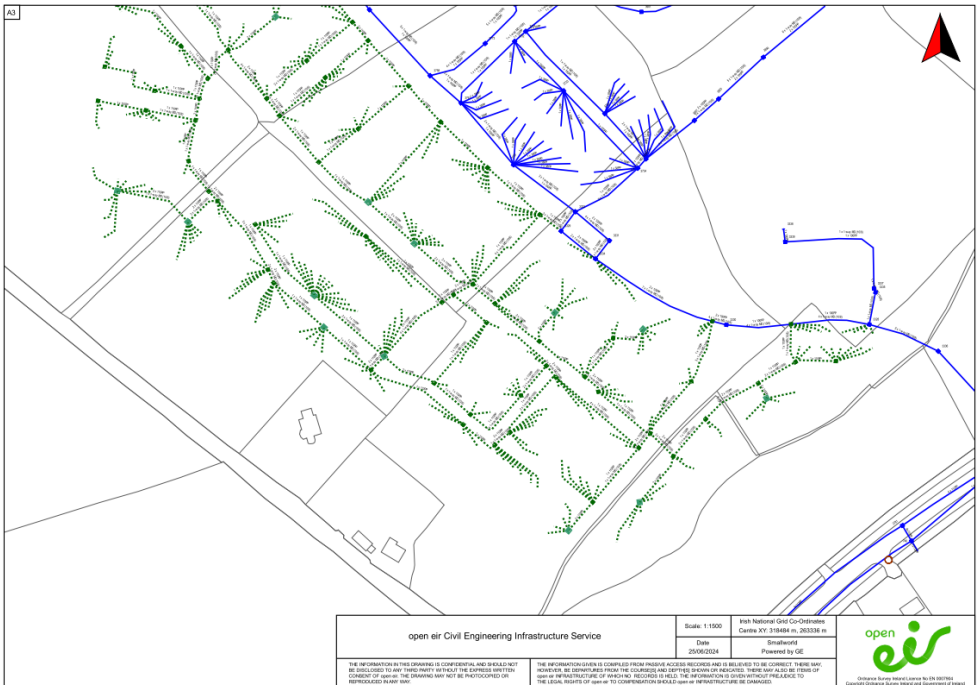
Figure 12.5 Existing records of ESB East of the proposed site



12.2.6 COMMUNICATIONS

See below for the nearest communication network which is provided by EIR along the Southern Boundary.

Figure 12.6: Existing records of Eir Network East of proposed site.



12.2.7 WASTE

The site is a greenfield with no waste facilities. There are currently waste collectors collecting the waste from the dwellings to the East of the development and it is anticipated that during the operational phase a similar plan will be in place.

12.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

This EIAR Chapter refers to project for 197 residential units and 2 commercial units and services as (attenuation, foul sewer, surface water), junction upgrade, as well as public open spaces for the overall Phase 4. A full description is provided in chapter 2 of the EIAR.

12.3.1 SURFACE WATER NETWORK

The surface water design has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers (GDSDS) for adoption 7th edition. Following consultation with Fingal County Council, there will be provided a detention basin to provide surface water storage volume. The allowable flow rate has been set at the greenfield run off rate. Surface water run-off from the surface water catchment will be attenuated using a Hydrobrake on the surface water outlet from the catchment area.

It is proposed to use a sustainable urban drainage system (SuDS) approach to stormwater management throughout the site. The overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater. The proposed SUDs that feature in the development are modular permeable paving, swales, bioretention, detention basins, and Hydrobrake flow control.

The drainage network for the overall Phase 4 lands was modelled and tested against different critical storms using the standard catchment rainfall profiles from the Flood Studies Report (FSR) within the Causeway Software. A critical storm is considered as a level of rainfall intensity, and the greater the year of the return period, the higher the intensity of the storm.

For each return period tested, the following storm durations have been simulated, to assess against the length that a storm would release rainfall into the drainage network: 15min; 30min; 60min; 120min; 180min; 240min; 360min; 480min; 600min; 720min; 960min; 1440min; 2160min;(3 days)

The average ground slope is greater than 1%, therefore the pipe network has been designed for a 2-years return period. This is in accordance with section C5.1 of the Sewers for Adoption seventh Edition.

The modelling and calculation of the storm water network for this phase 4 development, we followed the same parameters, scheme and hydrological inputs and have increased the Cv value from 0.84 to 0.9, in accordance with Fingal County Council for the Granted Permission for Phase 3A-3C.

As per section C5.2 of the "*Sewers for Adoption*" manual the chosen parameters and hydrological inputs for the design are as follows:

- Return period is 2 years;
- Design check carried out to ensure that no site flooding for 1:30 year return period plus 20% of Climate Change;
- Time of entry of taken as 4 mins as per Modified Rational Method;
- Annual Average Rainfall;
- M5-60: 14.4mm;
- Ratio: 0.273;

The calculations for the greenfield runoff of the above permissions used SOIL type 4 which refers to Soil index=0.45 (Institute of Hydrology Report No.124).

A ground investigation was carried out on the site and the results have shown that the material encountered was cohesive clay and therefore it can be classified with soil index of 0.45.

Noting above, the same parameters were used to calculate the greenfield runoff from Balbriggan Phase 3, using the equation given on the IH Report No. 124. (See equation on Section 3.4 Surface Water Attenuation in the Engineering Services Report).

Based on the above, the overall site catchment is 15.74Ha with 10.48Ha of the under-construction phase 3 and 5.26Ha of the proposed development phase 4 resulting in a total greenfield runoff of 80.52/s.

A development north of the subject site is proposed adjoining land and the greenfield run off from this site will discharge to the proposed Balbriggan network in a total runoff is equivalent to 50l/s, as per figure 12.7 (catchment area for phase 3). Therefore, the maximum allowable discharge on the outfall is the combination of these greenfield runoffs totalling 130.52l/s (as per figure 12.8 for proposed catchment).

Figure 12.7: Catchment Area for Phase 3

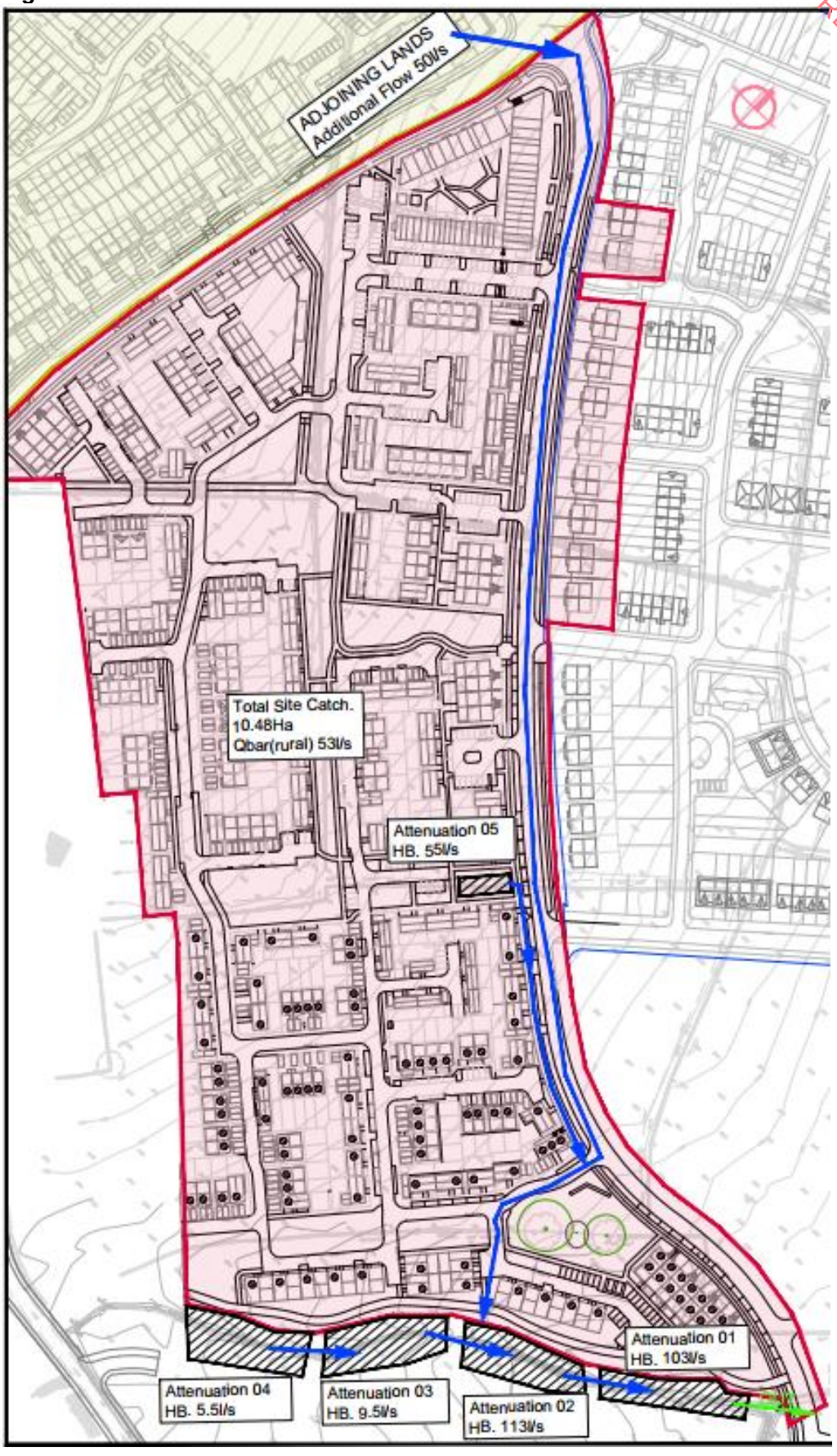
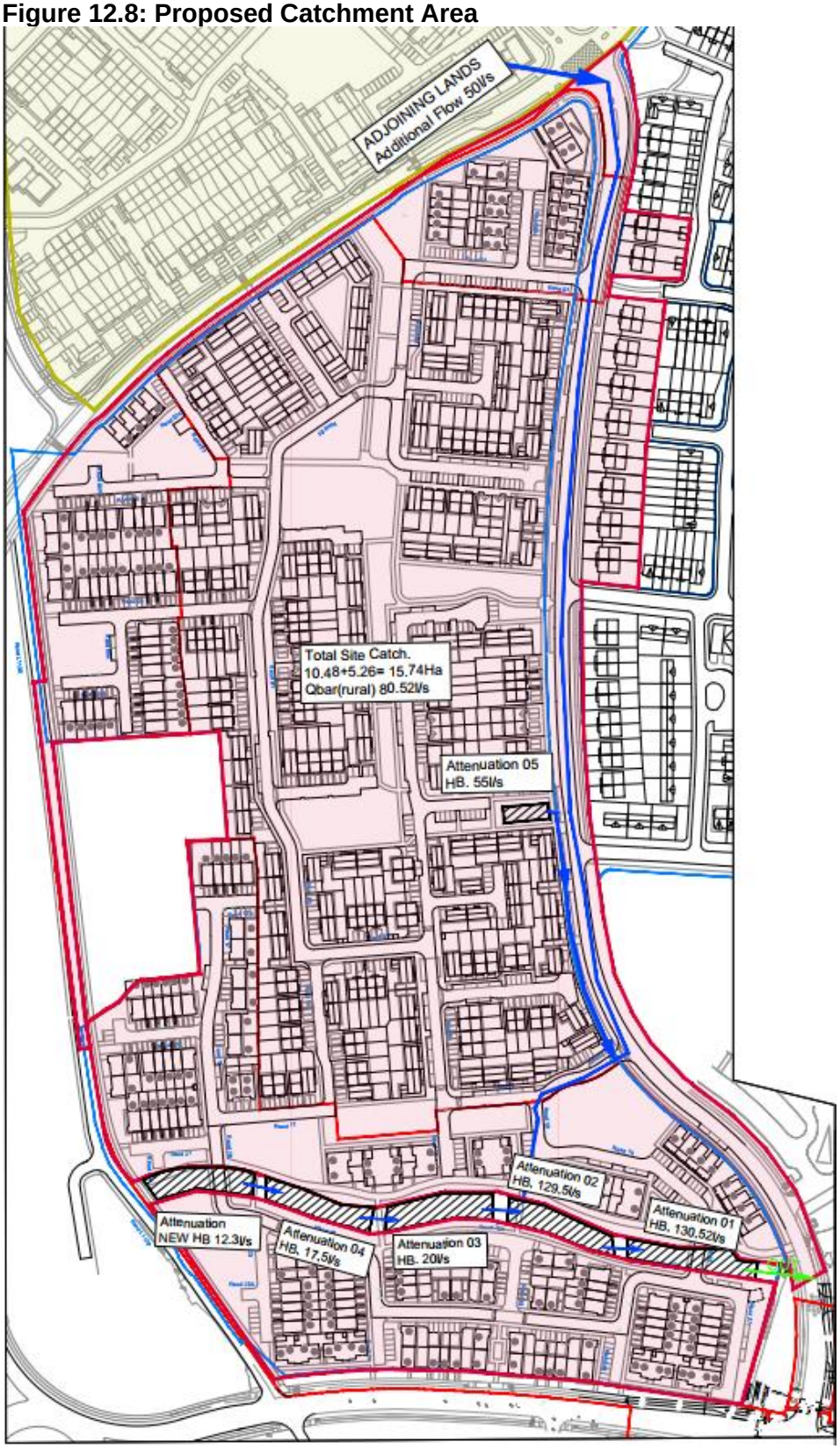


Figure 12.8: Proposed Catchment Area



Utilizing the topography of the site and the levels within the riparian corridor, the hydrobrakes have been adjusted to maximise the volume in each area. The total runoff from the site matches the greenfield runoff of 130.52l/s.

Therefore, in order to achieve the required volume in attenuation 01 it was necessary to divert the additional flow from the adjoining lands to the north and the boulevard road catchment into the attenuation 02. Due the additional section of the stream (as per figure 3.1) of the proposed development and to store the required volume for 1 in 100 yr. storm from this contributing area, the flow rate of the hydrobrake 02 has been increased with a flow rate of 129.5l/s, which is 1.02l/s less than hydrobrake 01.

Surface water runoff from the development would be attenuated to greenfield runoff (Qbar), in accordance with the recommendations of the GDSDS. Surface water run-off from each surface water catchment will be attenuated using a Hydrobrake on the surface water outlet from each catchment.

Following discussions with Fingal County Council, it was agreed to have all the attenuations above ground and following the design strategy permitted under the 3 previous phases (3A-3C).

A full analysis was carried out and hydrobrakes altered to reflect the increase in the catchment areas for the attenuation sections.

To protect the ground water, we have also introduced a number of petrol interceptor through the site and this is addition to the SUDS mitigation index design [see section 3.9 Water Quality Management: Design Methods (Treatment Volume) in the Engineering Services Report]. Qbar is calculated using the Institute of Hydrology equation, as recommended in the Greater Dublin Strategic Drainage Study (GDSDS), as follows:

- Qbar (rural) = 0.00108 x $AREA^{0.89}$ x $SAAR^{1.17}$ x $Soil^{2.17}$
- AREA is the area of the catchment in km^2. For a catchment area less than 50ha, calculate Qbar for 50 ha and pro rata it;
- SAAR = 833mm;
- SOIL = soil index 0.45
- Qbar: 5.115 l/sec/ha
-

The attenuation design is based on the 1:100-year Return Period plus 20% Climate Change attenuated for the catchment area as per Figure 12.8.

Table 12:1: Green field Run-off

Element	Catchment SW1
Area [ha]	**15.74**
Green Field Run-off (Q_{rural}) [l/s]	**80.52**

Table 12:2: Attenuation

Attenuation	Hydrobrake Outflow	Invert Level Attenuation (mOD)	Top Water Level for 1 in 100 Year Storm (mOD)	Volume for 100 Year Storm +20%(m^3)
01	130.52	32.200	33.570	303.54
02	129.5	33.540	34.800	405.93
03	20	34.260	36.200	337.65
04	17.5	35.800	37.400	384.34
05	55	37.256	39.226	124.75
New Att	12.3	36.190	37.190	247.69

Table 12:3: Impermeability Area for All Catchments

Overall Greenfield Area (ha)	Gross Areas (Ha)	Impermeability	Impermeable Area (Ha)
Roads, Paths Parking Bays and Buildings Area (ha)	5.687	80%	4.55
Permeable Paving Areas (ha)	0.603	30%	0.181

(The above impermeability factors were agreed with Fingal for Phase 2 and 3)

See Drawings " 2023-126-040371 - Catchment Area" and "2023-126-040361 – Proposed SUDS Layout & Details", "2023-126-040311 – Proposed Drainage Layout - Sheet 01" and "2023-126-040312 – Proposed Drainage Layout – Sheet 02".

12.3.2 FOUL NETWORK

The foul water drainage system for the proposed development has been designed in accordance with the Irish Water Code of Practice and will be separate to the surface water drainage system. The foul water from the development will discharge via soil vent pipes within the buildings by gravity flow before connecting into the existing separate foul sewer network within the development. The foul sewerage for each house will have a separate connection to the proposed 225mm and 150mm diameter foul sewer along the road.

The existing pipes were checked for capacity using the following criteria. Pipes carrying foul sewage shall be designed to carry a peak flow of 6 times average foul sewage flow (6DWF). A roughness coefficient, ks of 1.5mm is used for foul sewers. Foul drains are designed to achieve a minimum self-cleansing velocity of 0.75m/s when flowing half full.

Design Criteria

- Demand 446 l/dwelling/day
- Pipe Friction (Ks) 1.5 mm
- Minimum Velocity 0.75 m/s (self-cleansing velocity)
- Maximum Velocity 3.0 m/s (1:18 maximum pipe gradient)
- Frequency Factor 0.5 for domestic use

Residential Dwellings

Wastewater Discharge Calculation

- Dry Weather Flow 446 l/dwelling/day
- No. of Dwellings 197
- Post Development Average Discharge 1.017 l/sec
- Post Development Peak Discharge (6x) 6.102 l/sec
- Daily Foul Discharge Volume (446l per dwelling) 87862l

Non-Residential i.e. Retail

Wastewater Discharge Calculation

- Assumed Occupancy 20 persons

- Flow rate 50 l/person/day
- (Based on IW Code of Practice for Wastewater Infrastructure – Appendix C, Flow Rates for Design)
- Post Development Average Discharge 0.012 l/sec (Based on 8-hour occupancy)
- Post Development Peak Discharge (4.5x) 0.052 l/sec
- Daily Foul Discharge Volume 1000 l

A 150mm diameter sewer at a min gradient of 1:60 has been designed to cater up to 9 dwellings, and a 150mm diameter sewer at a min gradient 1:150 slope to cater 10 to 20 dwellings with no chance of any more house connecting. Pipes that cater more than 20 dwellings has been designed as 225mm diameter sewer at a min gradient of approximately 1:200.

150mm diameter sewer at a min gradient of approximately 1:60
Hydriatic performance with ks = 1.5
Discharge capacity = 20.0 l/s (>11 l/s)

150mm diameter sewer at a min gradient of approximately 1:150
Hydriatic performance with ks = 1.5
Discharge capacity = 12.6 l/s (>11 l/s)

225mm diameter sewer at a min gradient of approximately 1:200
Hydriatic performance with ks = 1.5
Discharge capacity = 32.1 l/s (>11 l/s)

See Drawings “2023-126-040311 – Proposed Drainage Layout - Sheet 01" and "2023-126-040312 – Proposed Drainage Layout – Sheet 02", “2023-126-040331 – Proposed Foul Sewer Longitudinal Sections - Sheet 01” and “2023-126-040332 – Proposed Foul Sewer Longitudinal Sections - Sheet 02”.

A Pre-Connection Enquiry has been submitted to the Uisce Eireann Confirmation of Feasibility and Statement of Design Acceptance are included in this application.

12.3.3 WATERMAIN NETWORK

Following consultation with Uisce Eireann the watermain network has been designed in accordance with IW Code of Practice for Water Infrastructure. A 150mm diameter HDPE watermain is proposed to supply water to the proposed development.

The proposed network has been designed to comply with Uisce Eireann specification. Individual houses will have their own connections to the distribution main via service connections and boundary boxes. Individual service boundary boxes will be of the type to suit Uisce Eireann and to facilitate possible future domestic meter installation.

The proposed network has been designed to comply with Irish Water specification. Individual houses will have their own connections to the distribution main via service connections and boundary boxes. Individual service boundary boxes will be of the type to suit Irish Water and to facilitate possible future domestic meter installation.

The water main layout and details are in accordance with Irish Water Connection and Developer Services, ‘Code of Practice for Water Infrastructure’ and ‘Water Infrastructure Standard Details’.

12.3.4 WATER DEMAND CALCS

Water Demand has been calculated in accordance with guidelines outlined in Irish Water's Pre-connection Enquiry Application Form:

Residential Dwellings

No. of Housing Units	197
Average Occupancy Ration (Persons Per Dwelling)	2.7
Per-Capita Consumption (l/person/day)	150
Average Domestic Daily Demand (l/sec)	0.93
Post Development Average Hour Water Demand (l/sec) (1.25 x Average Domestic Daily Demand)	1.15
Post Development Peak Hour Water Demand (l/sec) (5.0 x Post Development Average Hour Water Demand)	5.77

Non-Residential i.e. Retail

• Assumed occupancy	20
• Per-Capita Consumption (l/person/day)	50
• Average Domestic Daily Demand (l/sec)	0.012
• (Based on 8-hour occupancy)	
• Post Development Average Hour Water Demand (l/sec)	0.014
• (1.25 x Average Domestic Daily Demand)	
• Post Development Peak Hour Water Demand (l/sec)	0.07
• (5.0 x Post Development Average Hour Water Demand)	

See Drawings "2023-126-040301 – Proposed Watermain Layout - Sheet 01" and "2023-126-040302 – Proposed Watermain Layout - Sheet 02" .

A Pre-Connection Enquiry has been submitted to the Uisce Eireann Confirmation of Feasibility and Statement of Design Acceptance are included in this application.

12.3.5 ROAD NETWORK

Considering the topography, the site has been carefully designed to ensure that the road network fully complies with DMURS 2019 and Part M of the building regulations. Refer to DMURS compliance statement for details.

Vehicular and pedestrian access to the proposed development will be via the existing Boulevard Road.

12.3.6 ELECTRICAL SUPPLY

There is a substation which is been constructed as the previous phase and the power for the proposed development will be fed from this existing ESB substation. The proposed sub stations will provide power to a number of mini pillars which will provide power to the residential dwellings.

12.4 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the specific, direct and indirect impacts that the proposed development may have during both the construction and operational phase of the proposed project.

12.4.1 CONSTRUCTION STAGE

The construction phase of the proposed development is likely to result in short term impacts on the existing urban settlement in the vicinity of the site. The development will be constructed in a single phase with an anticipated completion by 2029

12.4.1.1 Ownership and Access

The subject lands are not developed at present. There will be some temporary disturbance during construction to the surrounding area, however, this will be minimized as best as possible through appropriate mitigation measures as set out in the Construction Environmental Management Plan, prepared by Paul McGrail Consulting Engineers, included in Appendix X of Volume III of the EIAR Potential impacts on the local road network are assessed in Chapter 11 Material Assets – Traffic and Transportation, and mitigation measures are proposed. The mitigation measures set out in this EIAR and the CEMP, along with any relevant conditions of the grant of permission, will be incorporated into the final Contractors CEMP.

Once a contractor has been appointed a detailed and final CEMP including traffic management details will be prepared and agreed prior to the commencement of the development. The surrounding road network is suitable to accommodate the construction traffic associated with the proposed development and the Construction Traffic Management Plan will include a range of mitigating measures as identified in the CEMP to ensure the safety of the workforce on the site and accessing the site, and the public on the surrounding roads and to minimise construction traffic generation and disruption on the surrounding road network.

The construction phase of the proposed development is likely to result in slight negative and short-term impact on the existing urban settlement in the vicinity of the site. The development will be constructed in a single phase, with the completion date of 2029

The operational stage will result in the provision of an additional 197 no. residential units and 2 no. commercial units along with open space and recreational areas.

12.4.1.2 Surface Water Drainage

In terms of the construction phase, the proposal will involve providing new connection to the existing surface water drainage ditch. The proposed service will consist of a connection to an existing ditch and will be performed in one working day. Any impacts will be neutral, imperceptible and brief. Potential impacts on the surface water infrastructure that may arise during the construction phase include:

- Contamination of surface water runoff due to construction activities.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.4.1.3 Foul Water Drainage

The proposal for the construction stage is to apply to Uisce Eireann for a temporary connection and to connect to the existing foul infrastructural network. There will be minimal impact on the existing service to the development under construction during the construction stage on the foul network.

The proposal will involve providing a new connection to the proposed foul water network granted for phase 3. The proposed service will consist of a connection to a proposed manhole and will be performed in one working day. Any impacts will be neutral, imperceptible and brief.

To mitigate the above best practice construction practices should be adhered to and Uisce Eireann procedures followed. The impact on foul drainage during the construction stage will be brief, neutral and imperceptible and no long-term impacts will result from the construction stage.

The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.4.1.4 Watermain

During the construction of the water main network, there will be minimal disruption to the quality of the local water supply to facilitate connections to the network. All such temporary shutdowns will be agreed with Uisce Eireann accordance with the appropriate procedures and people that will be affected will be advised in advance of the short-term impacts that they may experience.

The construction compound's potable water supply shall be protected from contamination by any construction activities or materials by constructing it to Irish Water standards with appropriate cover.

There is a risk of contamination to the existing water supply during the construction phase when the development is being connected to the water supply. All water mains will be cleaned and tested in accordance with Uisce Eireann guidelines and standards prior to connection to the public water main.

To mitigate the above best practice construction practices should be adhered to and Uisce Eireann procedures followed.

There will be a minor water demand for the site works, compound and offices during the construction stage.

Any potential impacts to water supply will be brief, neutral and imperceptible.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.4.1.5 Natural Gas

No works will be undertaken to the existing GAS network.

12.4.1.6 Electricity Supply

Construction related activities will require temporary connection to the local electricity supply network. The potential impact from the construction phase of the proposed development on the local electrical supply network is likely to be brief and imperceptible.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.4.1.7 Communications

Fixed telecoms will be provided from the existing network running along the central local road.

The potential impact from the construction phase of the proposed development on the local telecoms network is likely to be brief, neutral and imperceptible and negligible.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.4.1.8 Waste Management

The construction phase of the proposed development will give rise to the requirement to remove or to bring to the site quantities of material, including excavated material not suitable for reuse. Construction related material will also be created on the proposed development site. This has the potential to impact on the local municipal waste disposal network, but this will be short term and moderate. Refer to the Resource Waste and Demolition Waste Management Plan, prepared by AWN contained in Appendix E Volume III of the EIAR and chapter 13 Material Assets for further details.

12.4.2 OPERATIONAL PHASE IMPACTS

The proposal will result in the provision of an additional 197 residential units plus 2 no. commercial along with open space and recreational areas.

12.4.2.1 Ownership and Access

The proposed development includes for two vehicular accesses to the proposed development from the proposed local roads. A Traffic and Transport Assessment has been prepared by Transport Insights and is submitted with this planning application as a standalone report. The potential impacts are also identified in Chapter 11 Traffic and Transport. The Traffic and Transport Assessment assesses the anticipated levels of traffic generated by the proposed development and models the impacts of the proposed development on surrounding road infrastructure.

12.4.2.2 Surface Water Drainage

The proposed connection point of the Surface water will be to the existing field drain running centrally through the site. Without the consideration of mitigation measures the operational phase of the proposed development will likely have a neutral, permanent, slight impact.

12.4.2.3 Foul Water Design

During the operational phase there will be an increase in the foul discharge from the proposed development. This was discussed with Uisce Eireann a confirmation of feasibility was issued. Without the consideration of mitigation measures the operational phase of the proposed development will likely have a neutral, permanent, slight impact.

12.4.2.4 Watermain

The potential impact from the operational phase on the water infrastructure is an increase in the quantity of water to be treated and supplied through the network. Uisce Eireann have confirmed the existing network has capacity. Without the consideration of mitigation measures the operational phase of the proposed development will likely have a neutral, permanent, slight impact.

12.4.2.5 Natural Gas

All houses will utilise Air to Water Heat pumps which will negate the need for GAS. No impacts on supply are anticipated.

12.4.2.6 Electricity Supply

The impact of the operational phase of the proposed development on the electricity supply network is likely to increase the demand on the existing supply. The existing network has the capacity to cater for the proposed development. Therefore, it will likely have a neutral, permeant, imperceptible impact.

12.4.2.7 Communications

The installation of the telecoms (Virgin and Eir) will be in accordance with the requirements of the utility provider and will be carried out by approved contractors. There will be no impact in the operational phase of the telecoms network. The existing network has the capacity to cater for the proposed development. Therefore, it will likely have a neutral, permeant, imperceptible impact.

12.4.2.8 Waste

There will be an increased demand on the municipal waste disposal system operated by Fingal County Council . All of the waste generated will be subject to the Fingal County Council Bye Laws for the Segregation, Storage and Presentation of Household Waste. The impact is likely to be negligible.

12.4.3 RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

The proposed development has been designed and will be constructed in line with best practice and, as such, major accidents and / or natural disasters will be low. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. Measures to control risks associated with Construction Phase activities are incorporated into the Construction Environmental Management Plan, included in Appendix D of Volume III of the EIAR.

Excavation works coming into contact with live electricity lines could potentially give rise to a serious incident putting people at risk. This risk is not significant as all ESB services will be constructed below ground and main lines will be diverted prior to commencement of the works.

There will be no risk of gas explosion within the site since there is no gas network inside site boundary.

A flood risk assessment has been carried out to confirm that the site is not at risk from flooding. The control of storm water runoff to green field rates will help reduce the risk of flooding in the local ditches. Catchment and its discharge to this catchment will reduce the potential flood risk.

The risk of flooding due to attenuation failure is low due to design considerations of catchment areas and flow controls. The proposed infrastructure is designed in accordance with the relevant regulations, codes of practice and guidelines to provide sufficient flow capacity.

In case of obstruction of outflow in the overground storage structures a drawing was produced to show an overland flow route which ensures no dwelling is at risk from flooding.

The risk of soil pollution and ground water contamination caused by spillage or leaks is deemed low as the Foul network will be constructed to the required Uisce Eireann Standards and monitored during the works.

The collapse of soil from an exposed excavation is considered low due design measures once stockpile heights and their location are managed and any steep excavations are properly supported either with temporary works or by permanent retaining wall structures. All temporary works should they be required will be designed in accordance relevant codes of practice.

12.4.4 POTENTIAL CUMULATIVE IMPACTS

The cumulative effects of the development on material assets have been assessed taking into account other planned, existing and permitted developments in the surrounding area.

Other developments identified include:

Planning Reg. Ref. ABP-312048-21 (F21A/0055) – Phase 3A Ladywell

On the 13th of October 2023, An Bord Pleanála upheld the decision of Fingal County Council and granted permission for phase 3A as part of the overall phase 3 at Ladywell comprising 99 no. dwellings open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. F22A/0526 – Phase 3B Ladywell

Under Planning Reg. Ref. F22A/0526 Fingal County Council granted permission for phase 3B as part of the overall phase 3 at Ladywell which comprises *95 no. dwellings* open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. F22A/0670 - Phase 3C Ladywell

On the 5th of July 2023, Fingal County Council granted permission for development on the Phase 3C lands comprising 75 units open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. LRD0006/S3 ABP Reg. Ref. LH06F.319343

Permission granted by An Bord Pleanála for 564 no. dwellings, commercial units and open space.

Cumulatively with other surrounding permitted, planned and existing development, it is predicted that the proposed development will contribute to the improvement of the overall urban environment.

The cumulative effects of the development on the foul, surface water, watermain and waste management systems are anticipated to be short term, neutral, and imperceptible. No significant impacts are anticipated.

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services provided that the other developments implement appropriate mitigation measures.

12.5 MITIGATION MEASURES

All possible measures will be taken to avoid unplanned disruptions to any services within the site during construction of the proposed development. It should be noted that a number of mitigation measures are proposed in other chapters of this EIAR, which are collated into Chapter 17 of this EIAR. The mitigation measures contained in Chapter 17 of the EIAR will be incorporated into the Contractor's CEMP.

It should be noted that a number of mitigation measures are proposed in other chapters of this EIAR. Mitigation measures proposed in respect to Material Assets are as follows:

12.5.1 CONSTRUCTION STAGE

The following mitigation measures are proposed for the construction phase of the development with respect to Material Assets:

- The proposed development will comply with the provisions of the Resource Waste Management Plan prepared by AWN included in Appendix E of Volume III of the EIAR, with respect to construction waste.
- The proposed development will comply with the provisions of the Construction Environmental Management Plan included in Appendix D of Volume III of the EIAR.
- Water metering will be provided during the construction phase to record consumption.
- All new services will be constructed and provided in strict accordance with the relevant codes of practice.

12.5.2 OPERATION STAGE

- All new foul and surface water drainage pipes to be pressure tested and CCTV to identify any possible defects
- Water conservation measures to implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments.
- Ensure that all Hydrobrakes are designed to limit the flow of water from the development to the greenfield run off.
- All watermain pipes to be pressure tested in accordance with Uisce Eireann details.

In addition, construction stage mitigation measures are also provided in Table 12.4 below.

Table 12:4: Operational Stage Mitigation Measures

Character of potential impact	Mitigation measure
Construction Phase	
Damage to existing utilities	Contractor will prepare Method Statement detailing the proposals for works in the vicinity of existing utilities (method statement to be agreed with Project Supervisor Design Process (PSDP)
Contamination of surface water runoff due to construction activities	Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
Improper discharge of foul drainage from contractor's compound	Foul drainage discharge from the construction compound will be transported off site to a licensed facility until a connection to the public foul drainage network has been established.
Cross contamination of potable water supply to construction compound	The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
Damage to existing underground and overground infrastructure and possible contamination of the existing systems with construction related materials.	A site-specific Construction & Environmental Management Plan will be developed and implemented during the construction phase. Please refer to PMCG Construction & Environmental Management Plan.
Potential loss of connection to the Telecommunications infrastructure while carrying out works to provide service connections	Connections to the existing telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
Operational Phase	
Increased impermeable surface area will reduce local ground water recharge and	Please refer to Chapter 6.0 – Water Hydrogeology and Hydrology for mitigation measures associated with the surface water treatment.

potentially increase surface water runoff	
Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).	Please refer to Chapter 6.0 – Water Hydrogeology and Hydrology for mitigation measures associated with the surface water treatment.
Increased discharge to foul drainage network	Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.
Increased potable water consumption	Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.
Contamination of surface water runoff from foul sewer leaks.	All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

12.6 RESIDUAL IMPACTS

12.6.1 CONSTRUCTION PHASE

The construction stage of the proposed development will comprise of site clearance and preparation, excavation and the construction of the proposed development over three phases of development. The potential impacts associated with the construction stage of the proposed development on material assets are likely to be temporary and will cause minor disturbance. Provided mitigation measures are adhered to the construction phase of the proposed development will likely have a neutral, short-term, moderate impact.

12.6.2 OPERATIONAL PHASE

The proposed development will have a positive impact on the surrounding environment by providing much needed housing in the area and meeting the needs of the growing population.

The loading on the wastewater and watermains from the proposed development will be adequately accommodated in the foul and watermain network.

In compliance with the SUDS manual the runoff from the development will mimic the existing greenfield run off therefore, it will likely have a neutral, permeant, imperceptible impact.

12.7 MONITORING

Please refer to Chapter 6.0 – Water and Chapter 4.0 Biodiversity for the proposed monitoring in relation to the surface water during the construction phase. There is no specific monitoring is proposed in relation to the remaining material assets infrastructure during the construction phase.

Once operational water usage will be monitored by a bulk water meter and compared to anticipated usage. This will allow Uisce Eireann to monitor any potential leaks.

Proposed monitoring during the operational phase in relation to the water infrastructure are as follows:

- All drainage works will be approved by Fingal County Council, Sanitary Services Division, and will be carried out in accordance with the GDRCOP (Greater Dublin Regional Code of Practice for Drainage Works).
- The surface water and foul drainage systems will be monitored by way of observation of any flooding events if such occur and the establishment of a proper maintenance programme for all sewers / Suds features etc.

- Regular cleaning of pipe networks within the development taken in charge will ensure no blockage will obstruct any flow from surface and foul networks.
- On-going water usage within the proposed development will be monitored by bulk water meters. Water usage will be monitored by the relevant authority to avoid waste and leaks etc.
- All drainage works will be approved by Fingal Dublin County Council and will be carried out in accordance with the GDRCOP (Greater Dublin Regional Code of Practice for Drainage Works).
- All foul and surface water sewers will be CCTV surveyed prior to being 'taken in charge' by Fingal County Council.

12.8 SIGNIFICANT INTERACTIONS

12.8.1 SOILS AND GEOLOGY

12.8.1.1 Construction phase

Trench excavations to facilitate site service installation will result in exposure of subsoils and bedrock to potential erosion and subsequent sediment generation. Exposed soil during the construction phase of the proposed development may give rise to increased dust emissions. However, the implementation of the dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust.
Quality of Effect: Negative.
Significance of Effect: Slight.

12.8.1.2 Operational Phase

Interactions between soils/geology will be limited to the construction phase due to material excavation. Implementation of the mitigation measures described in Chapter 5 – Soil and Geology will prevent and minimize the potential impacts of this interaction.
Quality of Effect: Neutral.
Significance of Effect: Imperceptible.

12.8.2 WATER QUALITY

12.8.2.1 Construction Phase

A deterioration in water quality in nearby watercourses could occur during the construction phase of the proposed development due to rainwater run-off containing sediments, concrete and hydrocarbon spillages. Implementation of the mitigation measures described in Chapter 6 – Water: Hydrology and Hydrogeology will prevent and minimize the potential impacts of this interaction.
Quality of Effect: Neutral.
Significance of Effect: Not significant.

12.8.2.2 Operational Phase

As all wastewater from the site is to be discharge to the existing 450mm Uisce Eireann Pipe and it is not anticipated that there will be any impacts on water quality during the operational phase of the development. Implementation of the mitigation measures described in Chapter 6 – Water Hydrogeology and Hydrology will prevent and minimize the potential impacts of this interaction.
Quality of Effect: Neutral.
Significance of Effect: Not significant.

12.8.3 HUMAN HEALTH

12.8.3.1 Construction Phase

Mismanagement or failure of the potable water supply drainage could lead to contamination during the construction phase. Working in trenches and in close proximity with live services could pose a risk to human health if mitigation measures are not put in place. The exposure of bedrock could, cause the risk of Radon exposure to human health during the construction phase. The use of Radon barriers in construction will mitigate this risk.
Quality of Effect: Negative.
Significance of Effect: Slight.

12.8.3.2 Operational Phase

The completed development will generate additional emissions to the atmosphere due to traffic associated with the development, and due to plant equipment within the development. However, air quality in the region of the site is expected to be within the limits set by the air quality standard.

Implementation of the mitigation measures described in this chapter and in Chapter 6 – Water Hydrogeology and Hydrology will prevent and minimize the potential impacts of this interaction.
Quality of Effect: Negative.
Significance of Effect: Slight.

12.9 REINSTATEMENT

Reinstatement of any excavations relating to the provision of surface and foul drainage, electrical, gas and telecommunications connections is to be carried out in accordance with the relevant asset provider's requirements and the requirements of Fingal Dublin County Council.

12.10 REFERENCES AND SOURCES

CIRIA (January 2015) Environmental good practice on site guide (fourth edition)
EPA (May 2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports
EPA (September 2003) Advice notes on current practice in the preparation of Environmental Impact Statements

13.0 MATERIAL ASSETS – WASTE

13.1 INTRODUCTION

This chapter evaluates the likely impacts, if any, which the proposed development may have on Material Assets (related to waste management) as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022).

This chapter has also been prepared to address the issues associated with waste management during the construction and operational phases of the proposed development as described in Chapter 5 (Description of Proposed Development).

This Chapter was prepared by Chonaill Bradley (Bsc ENV,PG Dip Circ Econ, AssocCIWM) of AWN Consulting. Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia and a Postgraduate Diploma in Circular Economy Leadership for the Built Environment from the Atlantic Technological University, Galway. He is an Associate Member of the Institute of Waste Management (AssocCIWM). Chonaill has over nine years' experience in the environmental consultancy sector and specialises in sustainability, resource and waste management.

A site-specific Resource & Waste Management Plan (RWMP) has been prepared by AWN to deal with waste generation during the excavation and construction phases of the proposed development and has been included as **Appendix E 13.1 Volume III** of the EIAR. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021).

A separate Operational Waste Management Plan (OWMP) has also been prepared by AWN for the operational phase of the proposed development and is included as **Appendix E 13.2 Volume III** of the EIAR.

The Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017) and the EPA Guidelines on the Information to be contained in EIAR (2022).

These documents will ensure the management of wastes arising at the proposed development site in accordance with legislative requirements and best practice standards.

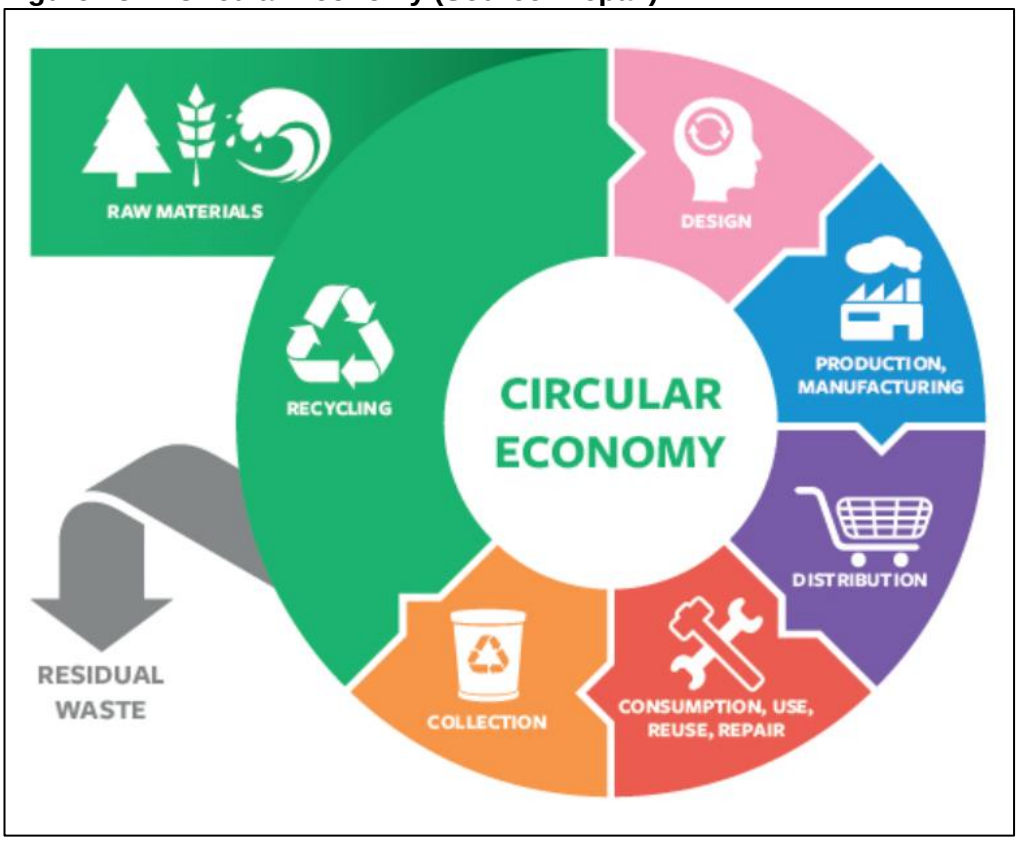
13.1.1 LEGISLATION AND GUIDANCE

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) as amended which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (**Figure 13.1**).

Figure 13.1: Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy (CE) by extracting high-quality resources from waste as much as possible. CE is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products (Figure 13.2).

Figure 13.2: Circular Economy (Source: Repak)



The Irish government issues policy documents that outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, A *Waste Action Plan for a Circular Economy – Ireland's National Waste Policy* (WAPCE), was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, *Waste Management Policy in Ireland*, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021). The guidance documents, *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* and *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *National Waste Management Plan for a Circular Economy 2024 - 2030* (NWMPCE) (2023), the Fingal County Council (FCC) *Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws, 2020*, the EPA National Waste Database Reports 1998 – 2020, the Circular Economy and National Waste Database Report 2021 (2023) and the EPA National Waste Statistics Web Resource.

13.1.2 TERMINOLOGY

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste: Any substance or object which the holder discards or intends or is required to discard.
Prevention: Measures taken before a substance, material or product has become waste, that reduce:
the quantity of waste, including through the re-use of products or the extension of the life span of products;
the adverse impacts of the generated waste on the environment and human health; or
the content of harmful substances in materials and products.
Reuse: Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.
Preparing for Reuse: Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.
Treatment: Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery: Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.
Recycling: Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.
Disposal: Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

13.2 METHODOLOGY

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This chapter is based on the proposed development, as described in Chapter 5 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation and excavation); and
- Operational phase.

A desktop study was carried out which included the following:

Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
Description of the typical waste materials that will be generated during the construction and operational phases; and
Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in **Section 13.3.1** of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5 of this EIAR (Land and Soils).

13.3 BASELINE ENVIRONMENT

In terms of waste management, the receiving environment is in the jurisdiction of FCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *NWMPCE* and the WAPCE.

The Regional Waste Management Planning Offices have issued the National Waste Management Plan for a Circular Economy 2024 - 2030 in March 2024, which supersedes the Eastern Midlands Region (EMR) waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The FCC *Fingal Development Plan 2023-2029* also set out policies and objectives for the FCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, FCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR, in the surrounding counties and over Ireland and Northern Ireland, for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability at the time of works being undertaken.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

13.4.1 DEMOLITION PHASE

There is no demolition associated with the proposed development.

13.4.2 CONSTRUCTION PHASE

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be topsoil and subsoil excavated to facilitate construction of new foundations and the installation of underground services. The project engineers, Paul McGrail Consulting Engineers, have estimated that c. 25,939.14 m^3 of material (topsoil and subsoil) will need to be excavated to do so. It is currently envisaged that c.12,740.42m^3 the excavated material will be able to be retained and reused on site. It is currently envisaged that c. 13,198.72m^3 material will need to be removed off-site. When material is required to be taken offsite it will be taken for appropriate off-site reuse, recovery, recycling and / or disposal.

If any material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is

required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (previously Article 27 of the European Communities (Waste Directive)). For more information in relation to the envisaged management of by-products, refer to the RWMP (**Volume III of the EIAR)**. **Appendix E 13.1**).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018).

Waste will also be generated from construction phase workers, e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (**(Volume III of the EIAR Appendix E 13.1**). The RWMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development. These are summarised in **Table 13.1**.

Table 13.1: Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	344.4	10	34.4	80	275.5	10	34.4
Timber	292.2	40	116.9	55	160.7	5	14.6
Plasterboard	104.4	30	31.3	60	62.6	10	10.4
Metals	83.5	5	4.2	90	75.1	5	4.2
Concrete	31.3	30	9.4	65	20.3	5	1.6
Other	156.5	20	31.3	60	93.9	20	31.3
Total	**1012.2**		**227.5**		**688.2**		**96.5**

13.4.3 OPERATIONAL PHASE

As noted in **Section 13.1**, an OWMP has been prepared for the proposed development and is included as **Appendix E 13.2 Volume III of the EIAR**. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable waste (MNR), as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the proposed development for the main waste types, based on the AWN waste generation model (WGM), is presented in **Table 13.2**, below, and is based on the uses and areas as advised by the project architects. Further unit breakdowns can be found in **Appendix E 13.2 Volume III of the EIAR**.

Table 13.2: Estimated waste generation during the operational phase

Waste Type	Waste Volume (m^3/week)	
	Residential Units (Combined)	Commercial Units (Combined)
Organic Waste	3.43	0.16
DMR	25.16	0.70
Glass	0.66	0.01
MNR	13.65	0.59
Confidential Paper	-	0.15
Total	**42.91**	**1.61**

The tenants and residents will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. As required, the tenants and residents will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). The locations of WSAs can be viewed on the plans submitted with the application under separate cover.

The OWMP seeks to ensure the development contributes to the targets outlined in the NWMPCE and the FCC waste Bye-laws.

13.5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development.

13.5.1 DO-NOTHING IMPACT

If the proposed development were not to go ahead (i.e. in the Do-Nothing scenario) there would be no excavation or construction or operational waste generated at this site. There would, therefore, be a **neutral** effect on the environment in terms of waste.

The site is zoned for development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

13.5.2 CONSTRUCTION PHASE

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction (see **Appendix E 13.1 Volume III of the EIAR** for further detail). General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored in the construction site compound or adjacent to it, on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, short-term, significant and negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management

practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant and negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, short-term, significant and negative.**

There is a quantity of topsoil and subsoil will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 9 (Land, Soils, Geology and Hydrogeology). Excavated material that cannot be reused onsite will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, short-term, significant** and **negative**.

13.5.3 OPERATIONAL PHASE

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be indirect, long-term, significant and negative.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste that is not suitable for recycling can be sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables, which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be indirect, long-term, significant and negative.

Waste contractors will be required to service the proposed development on a scheduled basis to remove waste. Further details can be found in Appendix E 13.2 Volume III of the EIAR. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be long-term, significant and negative.

13.6 MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concepts of the 'waste hierarchy' and "circular economy" are employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. A circular economy is a model of resource production and consumption in any economy that involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible.

13.6.1 CONSTRUCTION PHASE

The following mitigation measures will be implemented during the construction phase of the proposed development:

- As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the EPA 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as Appendix E 13.1 Volume III of the EIAR. The mitigation measures outlined in the RWMP will be implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix E 13.1 Volume III of the EIAR) in agreement with FCC, or submit an addendum to the RWMP to FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.

- The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.

- A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);

- A Resource Manager (RM) will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate potential reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 (By-products), as amended, European Union (Waste Directive) Regulations 2011-2020. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997 and the NWCPE. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

13.6.2 OPERATIONAL PHASE

The following mitigation measures will be implemented during the operational phase of the proposed development:

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

As previously stated, a project specific OWMP has been prepared and is included as **Appendix E 13.2**. **Volume III of the EIAR** The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the NWMPCE, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the FCC waste bye-laws.

The Facilities Management Company / Residents / Tenants of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.

In addition, the following mitigation measures will be implemented:

- The Facilities Management Company / Residents / Tenants will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;

  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- The Facilities Management Company / Residents / Tenants will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Facilities Management Company / Residents / Tenants will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Facilities Management Company / Residents / Tenants will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, The NWMPCE and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

13.7 RESIDUAL IMPACTS

The implementation of the mitigation measures outlined in **Section 13.5** will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases. It will also ensure that EU, national and regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

13.7.1 CONSTRUCTION PHASE

A carefully planned approach to waste management as set out in **Section 13.5.1** of this chapter, and adherence to the RWMP (which includes mitigation) (**Appendix E 13.1 Volume III of the EIAR**) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible** and **neutral***.*

13.7.2 OPERATIONAL PHASE

During the operational phase, a structured approach to waste management as set out in **Section 13.5.2** of this chapter, and adherence to the OWMP (which includes mitigation) (**Appendix E 13.2 Volume III of the EIAR**), will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be **long-term, imperceptible** and **neutral.**

13.8 INDIRECT AND /OR SECONDARY IMPACTS

It is not envisaged that there will be any indirect and/or secondary impacts outside of the items covered in section 13.3 as a result of the proposed development in relation to this chapter.

13.9 MONITORING

The management of waste during the construction phase will be monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator / Facilities Management to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

13.9.1 CONSTRUCTION PHASE

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The mitigation measures in the RWMP specify the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

13.9.2 OPERATIONAL PHASE

During the operational phase, waste generation volumes will be monitored by the Operator / Facilities Management against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

13.10 INTERACTIONS

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

13.10.1 LAND AND SOILS

During the construction phase, excavated topsoil and subsoil (c. 25,939.14, m^3) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that 12,740.42m^3 will be reused on site, while the remaining material (13,198.72m^3) will be removed offsite. When material is deemed unsuitable or is not required it will be taken off-site, for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5, Chapter 13 and the requirements of the RWMP (Appendix E 13.1 Volume III of the EIAR), will ensure the effect is **long-term, imperceptible** and **neutral.**

13.10.2 MATERIAL ASSETS – TRAFFIC

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be **temporary** in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be **imperceptible** in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 11 (Material Assets - Traffic). Provided the mitigation measures detailed in Chapter 11, Chapter 13 and the requirements of the OWMP (included as **Appendix E 13.2 Volume III of the EIAR**) are adhered to, the predicted effects are **short to long-term**, **imperceptible** and **neutral.**

13.10.3 POPULATION & HUMAN HEALTH

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated

potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and OWMP (**Appendices E 13.1** and **13.2**, respectively Volume III of the EIAR), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects predicted are **long-term, imperceptible** and **neutral**.

13.11 CUMULATIVE IMPACTS

As has been identified in the receiving environment section, all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such, any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

13.11.1 CONSTRUCTION PHASE

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. The following permitted or proposed developments could potentially overlap with the construction phase of the proposed development:

Table 13.3 Potential Overlapping Developments (Construction Phase)

Items
Planning Reg. Ref. ABP-312048-21 (F21A/0055) – Phase 3A Ladywell On the 13th of October 2023, An Bord Pleanála upheld the decision of Fingal County Council and granted permission for phase 3A as part of the overall phase 3 at Ladywell comprising 99 no. dwellings open space and services and road layout for phases 3A-3D.
Planning Reg. Ref. F22A/0526 – Phase 3B Ladywell Under Planning Reg. Ref. F22A/0526 Fingal County Council granted permission for phase 3B as part of the overall phase 3 at Ladywell which comprises *95 no. dwellings* open space and services and road layout for phases 3A-3D.
Planning Reg. Ref. F22A/0670 - Phase 3C Ladywell On the 5th of July 2023, Fingal County Council granted permission for development on the Phase 3C lands comprising 75 units open space and services and road layout for phases 3A-3D.
LRD0006/S3 On the 4th of July 2024 An Bord Pleanála granted permission for inter alia: (i) The demolition of an existing single storey dwelling (151sq.m) (Eircode K32 KR40), associated single-storey storage shed (14.9sq.m), and larger single-storey agricultural shed outbuilding (366sq.m), all of which are located to the south of Flemington Lane. (ii) The construction of 564 no. dwelling units, consisting of 378 no. houses ranging in height from two to three storeys (127 no. terraced two-bedroom houses; 5 no. three-bedroom detached houses; 156 no. three-bedroom semi-detached houses; 76 no. three-bedroom terraced houses; and 14 no. four-bedroom detached houses); 28 no. duplex blocks, ranging in height from two to three storeys, comprising 84 no. duplex units (22 no. one-bedroom duplexes, 36 no. two-bedroom duplexes and 26 no. three-bedroom duplexes) and 10 no. apartment blocks (FM1, FM2, M1, M2, FP1, HN1, HC1, HC2, HC3, and HS1) ranging in height from three to five storeys, comprising 102 no. apartments (35 no. one-bedroom apartments and 67 no two-bedroom apartments).
F22A/0033 Lands at Harvest Lodge, Folkstown Lane (Folkstown Little Td) and lands at Folkstown Great Td, Naul Road, Balbriggan, Co Dublin. 1. The development will consist of a distillery (total floor area of floor area 5659m2) which includes provision of an ancillary visitor centre, storage shed along with associated external plant.

Final Grant 10th February 2023
F22A/0480 Stephenstown Industrial Estate, Balbriggan, Dublin The development will principally comprise the construction of a two-storey warehouse unit with ancillary office and staff facilities and associated development as well as a single storey garage. The warehouse unit will have a maximum height of 14.78 metres with a gross floor area of 1,996 sq m including warehouse area (1,670 sq m), ancillary staff facilities (184 sq m) and ancillary office area (142 sq m). The garage will have a maximum height of 14.358 metres and a gross floor area of 500sq m. Final Grant 5th April 2023.

Due to the high number of waste contractors in the FCC area and the EMR, as provided from the National Waste Collection Permit Office and the EPA, there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all of the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the cumulative effect will be **short-term, not significant** and **neutral**.

13.11.2 OPERATIONAL PHASE

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place, as discussed above. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate any potential cumulative impacts associated with waste generation and waste management. As such the cumulative effect will be a **long-term**, **imperceptible** and **neutral**.

13.12 DIFFICULTIES ENCOUNTERED

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Ground Investigation (GI) process provides spot samples, and further testing may be required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There is a number of licensed, permitted and registered waste facilities in the FCC region, in the surrounding counties, the eastern midlands waste region and in Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can imported as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost.

13.13 REFERENCES

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- Environmental Protection Agency Act 1992 as amended.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Regional Waste Management Planning Offices, The National Waste Management Plan for a Circular Economy 2024 – 2030 (2024).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
- European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022).
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021).
- Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).
- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- Fingal County Council (FCC), Fingal Development Plan 2023-2029 (2022).
- FCC, Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws (2020).
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.
- Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018).
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- EPA, European Waste Catalogue and Hazardous Waste List (2002).
- Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 -
- US EPA, Characterisation of Building Uses (1998).
- EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).

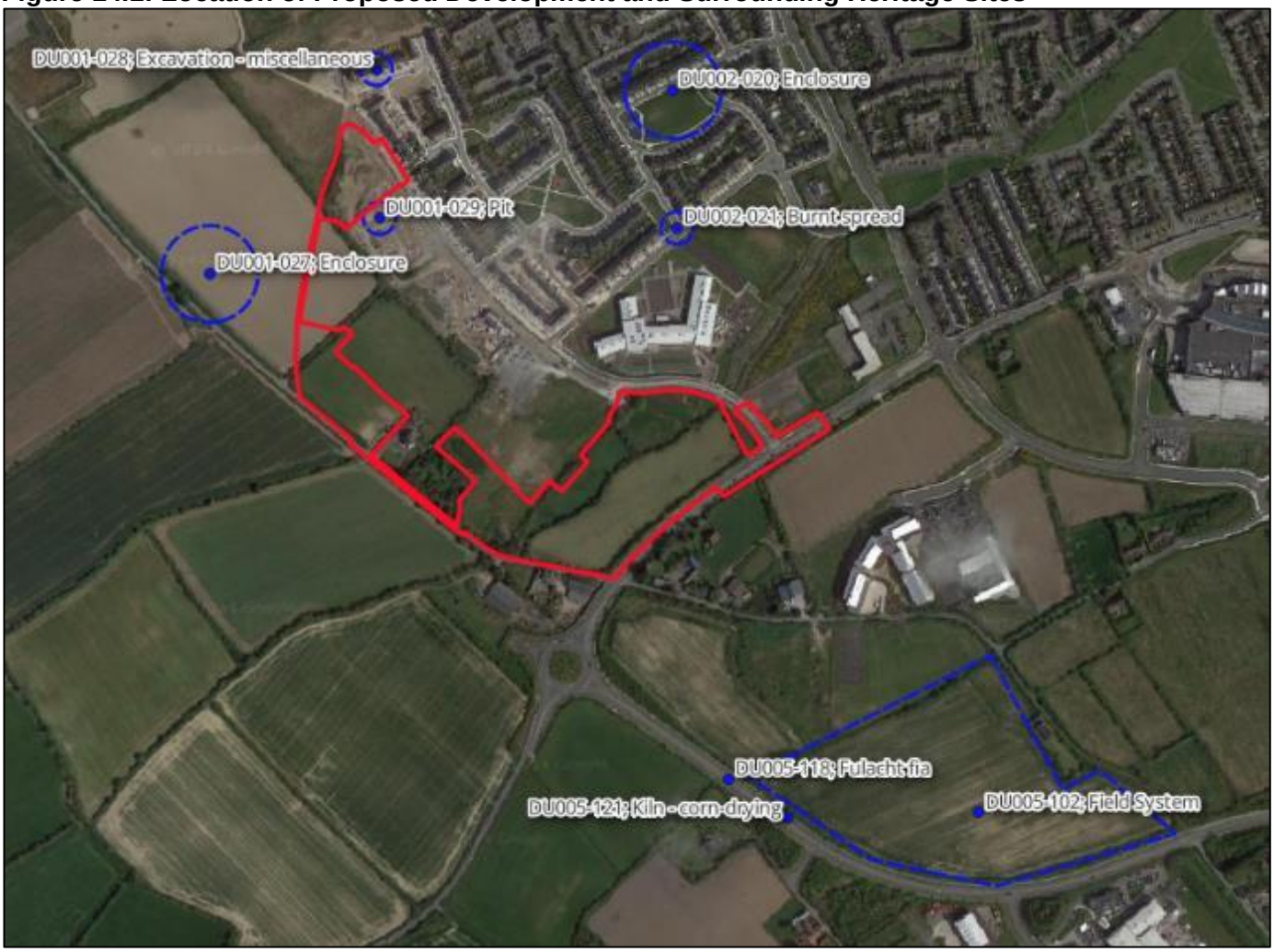
14.0 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

14.1 INTRODUCTION

14.1.1 GENERAL

IAC Archaeology has prepared this chapter on behalf of Marshall Yards Development Company Ltd., to assess the impact, if any, on the archaeological, architectural, and cultural heritage resource of a proposed development at Balbriggan, County Dublin (Phase 4, Figure 14.1). The assessment was undertaken by Faith Bailey (MA, BA (Hons), MIAI, MCIfA) of IAC Archaeology. Faith has over 20 years' experience in archaeological and cultural heritage consultancy, responsible for the production of EIAR and assessments for all aspects of development nationwide. The proposed development area is located within the townlands of Clogheder and Clonard or Folkstown Great, to the west of Balbriggan, County Dublin.

Figure 14.1: Location of Proposed Development and Surrounding Heritage Sites



This study determines, as far as reasonably possible from existing records, the nature of the archaeological resource in and within the vicinity of the development area using appropriate methods of study. The study area is defined as an area measuring 500m from the proposed development area.

Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate

consideration of the settings of heritage assets (CIfA 2014). In order to compile a complete baseline, a site inspection is carried out to complement the results of the desk-based assessment. This leads to the following:

- Determining the presence of known archaeological and built heritage sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Determining the impact upon the setting of known cultural heritage sites in the surrounding area;
- Suggested mitigation measures based upon the results of the above research.

14.1.2 DEFINITIONS

In order to assess, distil and present the findings of this study, the following definitions apply:

'*Cultural Heritage'* where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where –

- the term '*archaeological heritage'* is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places).
- the term '*architectural heritage'* is applied to structures, buildings, their contents and settings of an (assumed) age typically younger than AD 1700.
- the term '*cultural heritage'*, where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

14.1.3 IMPACT DEFINITIONS

The quality and type of an effect can be classed as one of the following (as per the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports [EPA 2022]:

- negative effect: A change which reduces the quality of the environment, for example a change that will detract from or permanently remove an archaeological or cultural heritage site from the landscape;
- neutral effect: A change which does not affect the quality of the environment; or
- positive effect: A change which improves the quality of the environment, for example a change that improves or enhances the setting of archaeological or cultural heritage sites.

The below terms are used in relation to the archaeological and architectural heritage and relate to whether a site will be physically affected upon or not:

- direct effect: Where an archaeological/cultural heritage feature or site is physically located within the footprint of the proposed development and entails the removal of part, or all, of the monument or feature; and
- indirect effect: Where a feature or site of archaeological or cultural heritage merit or its setting is located in close proximity to the footprint of a development.
- Neutral: No effects (either negative or positive) are predicted.

Table 14.1: Significance of Effect Definitions (as defined by the EPA 2022 Guidelines, 50-52)

Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound effects	An effect which obliterates sensitive characteristics.

14.1.4 CONSULTATIONS

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

- Department of Housing, Local Government and Heritage – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders and Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland;
- Fingal County Council: Planning Section; and
- Historical and Ordnance Survey Maps.

14.2 ASSESSMENT METHODOLOGY

The assessment has been carried out in four phases. The first phase comprised a paper survey of all desktop resources. The second phase comprised a field inspection of the proposed development area. The third and fourth phases comprised a programme of geophysical survey and archaeological test trenching, which was carried out in the southern portion of the development area (within lands not previously subject to archaeological investigation).

14.2.1 PAPER SURVEY

The following sources were examined and a list of areas of archaeological, architectural, and cultural heritage potential was compiled:

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- Monuments in State Care Database;
- Preservation Orders;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Fingal County Development Plan 2023-2029;
- Aerial photographs;

- Place Name Analysis;
- Excavations Bulletin (1970–2024); and
- National Inventory of Architectural Heritage.

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological, architectural and cultural heritage landscape of the proposed development.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Fingal County Development Plan (2023-2029) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey and Google Earth.

Place Names are an important part in understanding both the archaeology and history of an area. Place names can be used for generations and in some cases have been found to have their root deep in the historical past.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2024.

The National Inventory of Architectural Heritage is a state initiative established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 tasked with making a nationwide record of significant local, regional, national and international structures, which in turn provides county councils with a guide as to what structures to list within the Record of Protected Structures. The NIAH have also carried out a nationwide desk-based survey of historic gardens, including demesnes that surround large houses.

14.2.2 FIELD INSPECTION

Field inspection is necessary to determine the extent and nature of archaeological, architectural, and historical remains and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The field inspection entailed:

- Inspecting the proposed development area and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological, architectural, or cultural heritage significance.
- Verifying the extent and condition of any recorded sites.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

14.2.3 GEOPHYSICAL SURVEY

Geophysical survey is used to create ‘maps’ of subsurface archaeological features. Features are the non-portable part of the archaeological record, whether standing structures or traces of human activities left in the soil. Geophysical instruments can detect buried features when their electrical or magnetic properties contrast measurably with their surroundings. In some cases, individual artefacts, especially metal, may be detected as well. Readings, which are taken in a systematic pattern, become a dataset that can be rendered as image maps. Survey results can be used to guide excavation and to give archaeologists insight into the pattern of non-excavated parts of the site. Unlike other archaeological methods, the geophysical survey is not invasive or destructive.

A geophysical survey was undertaken within the southern portion of the proposed development in January 2024 (Leigh 2024, Licence No. 24R0031). A summary of the geophysical report is presented in this chapter and the full technical report is included in Appendix A 14.1 Volume III of the EIAR.

14.2.4 ARCHAEOLOGICAL TEST TRENCHING

Archaeological Test Trenching can be defined as ‘a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality’ (CIfA 2020a, 4). A programme of archaeological testing based on the results of the geophysical survey was carried out within the southern

portion of the proposed development in June 2024. This was undertaken by Jane Whitaker of IAC under licence 24E0590 (Whitaker 2024a). Detailed results of the archaeological testing are included in this chapter and Appendix A 14.2 Volume III of the EIAR.

14.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

14.3.1 ARCHAEOLOGICAL, ARCHITECTURAL AND HISTORICAL BACKGROUND

The proposed development area is located within the townlands of Clogheder and Clonard or Folkstown Great, Parish of Balrothery and Barony of Balrothery East, County Dublin (Figure 14.1). It is situated c. 1.5km west of the centre of Balbriggan and located within lands that are zoned for residential development within the Fingal County Development Plan (2023-2029).

There are no recorded monuments located within the proposed development area. The closest recorded monument comprises the site of a pit (RMP DU001-029) recorded c. 23m to the southeast of the northern site. An enclosure is located c. 115m to the west (RMP DU001-027). There are no protected structures located within 500m of the proposed development area, as listed within the Fingal County Development Plan (2023-2029). Similarly, no structures listed within the National Inventory of Architectural Heritage are located within the 500m study area.

Prehistoric Period

Mesolithic Period (8000-4000 BC)

Recent discoveries may suggest the possibility of a human presence in the southwest of Ireland as early as the Upper Palaeolithic (Dowd and Carden 2016); however, the Mesolithic period is the earliest time for which there is clear evidence for prehistoric human colonisation of the island of Ireland. During this period people hunted, foraged and gathered food and appear to have led a primarily mobile lifestyle. The presence of Mesolithic communities is most commonly evidenced by scatters of worked flint material, a by-product of the production of flint implements.

The eastern seaboard of Ireland has long been associated with prehistoric settlement. This area was intensively and repeatedly settled during this period. Clonard or Folkstown Great contains sites from the Mesolithic through to the Bronze Age and the medieval period. A Mesolithic pathway was identified during excavation in advance of a school development (Bennett 2016:150, Licence No. 15E0586), c. 113m to the north of the southern portion of the proposed development area.

Neolithic Period (4000–2500 BC)

During this period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. The transition to the Neolithic was marked by major social change. Communities had expanded and moved further inland to more permanent settlements. This afforded the development of agriculture which demanded an altering of the physical landscape. Forests were rapidly cleared and field boundaries were constructed. Pottery was also being produced, possibly for the first time. The advent of the Neolithic period also provided the megalithic tomb. There are four types of tomb in Ireland, namely the Court Cairn, Portal, Passage and Wedge; of which the latter style straddles the Neolithic to Bronze Age transition.

A Neolithic cremation pit was uncovered during testing and excavations (Bennett 2018:822, Licence No. 18E0238), c. 36m to the northeast of the northern portion of the proposed development area. Linear enclosing ditches and evidence of Neolithic activity in the form of a curvilinear channel and the burnt remnants of a possible hearth were also revealed. Evidence for Neolithic habitation (DU001-014) was identified c. 243m northeast of the northern portion of the site at Flemington. Here a substantial assemblage of early Neolithic pottery was recovered (Bolger 2009, 25). Within the wider area, a passage

tomb cemetery (DU002-001001-5) is located at Bremore to the north of Balbriggan, c. 2.8km northeast of the northern portion of the proposed development area.

Bronze Age (2500–800 BC)

This period is marked by the use of metal for the first time. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. Megaliths were replaced in favour of individual, subterranean cist or pit burials that were either in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often, but not always, accompanied by a pottery vessel.

An enclosure (DU002-020), c. 346m to the east-northeast of the northern portion of the proposed development area, was tested in 2017 (Bennett 2017:238, Licence No. 17E0247). This recovered late Bronze Age pottery from an inner enclosure ditch and identified peripheral features comprising a rectangular trough and six pits. The feature may represent a larger-scale Bronze Age funerary monument, several of which have been identified in Fingal to date.

In 2015, archaeological testing to the immediate northeast of the southern site identified 26 features comprising prehistoric and medieval activity (Bennett 2015:372, Licence No. 15E0507). These features included a Bronze Age penannular enclosure likely representative of a burial monument as well as a portion of a ring barrow (Bennett 2016:150, Licence No. 15E0586). The southern portion of the ring barrow had been previously excavated in relation to the Boulevard Road (Bennett 2015:165, Licence No. 15E0558).

Over 7,000 burnt mounds or *fulacht fia* sites have been recorded in the country and c. 1,500 examples excavated, making them the most common prehistoric monument in Ireland (Waddell 2022, 164). Although burnt mounds of shattered stone occur as a result of various activities that have been practised from the Mesolithic to the present day, the Bronze Age has long been believed to have seen the peak of this activity. Dating evidence from a growing number of burnt mounds, suggests activities resulting in burnt mounds were being carried over a span of 3,500 years in Ireland (Hawkes 2018). They are typically located in areas where there is a readily available water source, often in proximity to a river or stream or in places with a high-water table. In the field burnt mounds may be identified as charcoal-rich mounds or spreads of heat shattered stones, however, in many cases, the sites have been disturbed by later agricultural activity and are no longer visible on the field surface. Nevertheless, even disturbed spreads of burnt mound material often preserve the underlying associated features, such as troughs, pits and gullies, intact.

A burnt spread (DU002-021) was identified by testing, c. 200m to the north of the southern portion of the proposed development area (Bennett 2007:422, Licence No. 07E0057) although it is incorrectly plotted on the SMR map. Testing (Bennett 2015:372, Licence No. 15E0507) in advance of a school in 2015 (see above) identified a middle Bronze Age burnt spread and a late Bronze Age *fulacht fia.*

Iron Age (800 BC–AD 500)

There is increasing evidence for Iron Age settlement and activity in recent years as a result of development-led excavations as well as projects such as Late Iron Age and Roman Ireland (Cahill Wilson 2014). Yet this period is distinguishable from the rather rich remains of the preceding Bronze Age and subsequent early medieval period, by a relative paucity within the current archaeological record. The Iron Age in Ireland is problematic for archaeologists as few artefacts dating exclusively to this period have been found and without extensive excavation, it cannot be determined whether several monument types, such as ring barrows or standing stones, date to the late Bronze Age or Iron Age. It is likely that there was significant continuity in the Iron Age, with earlier monuments re-used in many cases. An Iron Age charcoal production pit was discovered during testing (see above) in advance of a school development (Bennett 2015:372, Licence No. 15E0507).

Early Medieval Period (AD 500–1100)

The early medieval period is depicted in the surviving sources as an almost entirely rural based society. Territorial divisions were based on the *túath*, or petty kingdom, with Byrne (1973) estimating that there may have been at least 150 kings in Ireland at any given time. This period, with a new religious culture and evolving technologies, saw significant woodland clearance and the expansion of grassland. A new type of plough and the horizontal mill were two innovations that improved agriculture and allowed for the population to increase. Consequently, from c. AD 500 onwards, the landscape became well settled, as evidenced by the profuse distribution of ringforts, a dispersed distribution of enclosed settlements, normally associated with various grades of well-to-do farming and aristocratic classes in early medieval Ireland (Stout and Stout 1997, 20).

Between the 7th and 10th centuries AD, the area of the proposed development was located within the eastern part of the *Bréga* territory of the *Síl nÁedo Sláine* branch of the southern *Uí Néill*, which included most of Meath, south Louth, and north Dublin (Byrne 1973, 397). Whilst this tribe had ultimate control, the area was occupied and controlled on a local level by indigenous tribal groups who most likely paid tribute to the *Uí Néill* during this period (Carroll 2008, 13). The tribal groups associated with the Fingal area around the 7th century may have included the *Árd Ciannachta* and the *Gailenga* (ibid. 13). While the general area of Balbriggan and its surroundings could have fallen at some point within the territory of the *Gailenga* and would have certainly formed part of the early *Ciannachta* coastal hegemony, likely, it is more closely associated with the *Saithne* (Bolger 2009, 28). They are particularly associated with the Barony of Balrothery and claimed descent from *Tadc Meic Céin*. Their rise to prominence was aided by the collapse of the *Ciannachta* hegemony and the increasing fragmentation of the *Síl nÁedo Sláine*. It has been suggested that their land formed a buffer between the territory controlled by the Norse of Dublin and the main sub-kingdoms of *Bréga* (Bhrethnach 1999, 5-6). They profited politically from an ambiguous relationship with the Norse and by the 11th and 12th centuries, the ruling branch, the *Ua Cathasaig*, were styling themselves as Kings of Brega (Bolger 2009, 28).

The ringfort or rath is considered to be the most common indicator of settlement during the early medieval period (Stout 1997). One of the most recent studies of early medieval settlement enclosures has suggested that there is potential for at least 60,000 such sites to have existed on the island (O'Sullivan et al. 2014, 49). Ringforts were often constructed to protect rural farmsteads and are usually defined as a broadly circular enclosure delineated by a bank and ditch. Ringforts can be divided into three broad categories – univallate sites, with one bank or ditch; multivallate sites with as many as four levels of enclosing features and platform or raised ringforts, where the interior of the ringfort has been built up. These enclosed sites were intimately connected to the division of land and the status of the occupant. A possible ringfort (DU001-027) is located c. 115m to the west of the proposed development area, measuring approximately 30m in diameter. Within the wider area, a large-scale bivallate ringfort (DU005-115), with an associated souterrain, field system and outer enclosure is recorded at Stephenstown, c. 877m to the southeast of the southern portion of the proposed development area. A portion of this site was excavated in 2008 (Bennett 2007:549, Licence No. 07E0836ext) and was carbon 14 dated to cal. AD 779-960.

Evidence for early medieval settlement has also been recorded in the wider area of the proposed development. In 2005, a programme of test trenching and a geophysical survey (Bennett 2005:487 Licence No. 05E0663; Leigh 2005, Licence No. 05R0114), c. 336m to the north of the northern portion of the proposed development area, identified a number of archaeological features and deposits. These features included a sub-square enclosure (DU001-024) and a multi-ditched enclosure (DU001-015). Additional testing was carried out in 2006 to provide more information on the exposed features (Bolger 2006). Excavation of the enclosures dated them to the early medieval period based on finds of several ring-headed pins (Bennett 2006:658, Licence No. 05E0663).

Medieval Period (AD 1100–1600)

In the 11th and 12th centuries, just before the Anglo-Norman invasion, Fingal lay between the competing political and territorial zones of the Kingdom of *Midhe* and the Hiberno-Norse Kingdom of Dublin. The

piecemeal conquest by the Anglo-Normans of Ireland, which commenced in 1169, had a fundamental impact on the Irish landscape. By 1185 the Anglo-Normans held the cities of Dublin, Waterford and Cork along with their immediate hinterlands. The initial military successes of the Anglo-Normans are attributed to their fighting skill especially on horseback, their organisation and their ability to build strongholds quickly in strategic positions. They also had a preference for established sites with existing infrastructure. The introduction of the large earthwork (Motte) and timber and stone castles of the Anglo-Normans was novel to the Irish landscape and these features are predominantly found in the south and east of the country in the areas of Anglo-Norman colonisation.

The largest medieval settlement within the landscape surrounding the proposed development area is Balrothery, which is located c. 2.3km to the southeast. A probable small manor was also present at Bremore, adjacent to Bremore Castle (DU002-002001), c. 1.7km to the northeast, with a further medieval settlement present at Folkstown Little and Folkstown Great, c. 423m to the southeast of the southern portion of the proposed development area (Kavanagh 2010, Licence No. 08E0054). One Anglo-Norman name links Bremore and Balrothery during the medieval period, which is De Rosel. Robert de Rosel was granted land at Balrothery at an early stage of the Anglo-Norman invasion. He was a direct descendent of Hugh de Rozel who came from a hamlet of the same name in Normandy (Carroll 2008, 17).

De Rosel and his men helped Strongbow's army take the Viking city of Dublin and De Rosel was rewarded with lands in Balrothery. He had seven sons and one daughter. His fourth son Patrick, who had been enfeoffed in one knight's fee with land in Derbyshire is recorded as living in Balrothery during c. 1200. By this time land at Balrothery also belonged to de Costedin, as it is recorded that he donated land to the church between 1192 and 1212. However, as de Rosel is recorded as a parson in Balrothery Church, the transfer of land was not to take place until after his death (ibid. 17).

At Bremore, the earliest references to a possible castle or manor are found in the Gormanston Register, which names Wylliam Rosselle as Lord of Dunbegh in County Derby and Bremore in Ireland (O'Carroll 2009, 79). The Gormanston Register is a collection of manuscripts dating from 1175 to 1397, which were collected by the Viscounts Gormanston and are now held by the National Library. The Dunbegh title presumably refers to the knight's fee in County Derby that was held by Patrick de Rosel at the turn of the 13th century. William is also mentioned in association with Bremore in the Calendar of Documents Relating to Ireland in 1299-1300 (ibid. 79). It is therefore reasonable to argue that de Rosel was granted a large amount of land in and around Balrothery, which may well have included Folkstown Little and Great.

Post-Medieval Period (AD 1600–1800)

After defeating James II at the Battle of the Boyne in 1690, William of Orange established his camp in Balbriggan c. 1.5km to the east of the proposed development area. The population of Balbriggan was relatively small in 1659, consisting of only 30 people, with 26 being Irish and four being English, compared to neighbouring villages like Balrothery with a population of 204 and Balscadden with 190. With the introduction of new industrial developments in the weaving industries and the construction of a new coach road that ran through the town, Balbriggan began to experience rapid growth. The expansion of the town is well-documented and owes much to the foresight and ambition of the Hamilton family, who owned a large portion of the area. In 1780, Baron Hamilton established Smyco, a weaving company that provided significant employment opportunities for the region.

The ending of the Williamite Wars saw the beginning of a comparative politically calm era, which allowed the country's landowners the security to experiment with the latest styles of architecture without the need to refer to defensive matters. Initially, constraints on available resources resulted in mansions of a relatively modest scale and relatively plain appearance. As the Irish aristocracy's sense of security grew over the following decades, their greater access to wealth helped foster a shift towards more ostentatious buildings. Buildings of architectural heritage value in the vicinity of the proposed development area include Tankard Ville (RPS 0016; RMP DU002-011) surrounded by a demesne landscape (Garden Survey 2186), c. 1km northeast of the southern portion of the proposed development area. This building is recorded as having

been sold to John Rottorn of Dublin in 1702 and is currently in use as Balbriggan Community Creche and Playschool.

14.3.2 SUMMARY OF PREVIOUS ARCHAEOLOGICAL FIELDWORK

A review of the Excavations Bulletin (1970–2024) has revealed that previous archaeological investigations have been carried out within the proposed development area. Additional investigations have also been carried out within the environs of the site, which are summarised below.

A geophysical survey was carried out on the lands to the south of Flemington Lane to the RI22 in 2005, which included portions of the proposed development area (Nicholls and Shiel 2005, Licence No. 05R0137). A number of anomalies were identified within the surrounding landscape including several enclosures (DU001-027, DU001-020/5) and a field system (DU001-023). Part or all of seven panels of the geophysical survey were carried out within the southern extents of the proposed development area: 8e, 9a, 14a, 16b, 18, 19 and 20.

No definitive archaeological sites were identified within the panels of the geophysical survey, although 16b highlighted one well defined linear response/possible former boundary. Area 18 revealed the presence of a large ferrous object, such as a pipe. In addition, possible archaeological anomalies were identified in Area 20, which were interpreted as potentially representing the remains of a settlement. This area was subject to further geophysical survey in 2024 (Appendix A 14.1 Volume III of the EIAR).

In 2007, a detailed programme of archaeological testing was carried out across a portion of the landscape including the northern and central portions of the proposed development and part of the southern site (Figure 14.2). This identified 38 varied archaeological sites across the wider landscape including enclosures, pits, linear features and burnt spreads (Elliot 2007a, Licence No. 07E0057). A large circular pit (DU001-029) was recorded c. 23m southeast of the northern portion of the proposed development area, which contained a charcoal-rich fill. A flint blade was recovered from the fill suggesting a prehistoric date. No features of archaeological significance were identified within the proposed development area, although the enclosure (DU001-027) located c. 115m to the west was positively identified.

Three of the sites identified during testing under licence 07E0057 were archaeologically excavated in 2018 (as evidenced by Google Earth coverage dating to 2018). The published excavation summary (Bennett 2018:822, Licence No. 18E0238) does not include a cross-reference to the testing IDs assigned to the sites when initially identified. The investigations identified a number of scattered pits, post holes and some linear ditches. Some probable Neolithic flints were recovered, indicating the activity is likely to be prehistoric in date. The excavated area were located to the immediate southeast of the northern portion of the proposed development area.

In 2024, archaeological monitoring was carried out in the northern part of the proposed development area as part of permitted development (Planning Ref.: F22A/0526) (Whitaker 2024b, Licence No. 23E0879). Nothing of archaeological potential was identified during the course of these works. The location of pit DU001-029 was exposed but was found to represent the remains of a degraded dark grey stone.

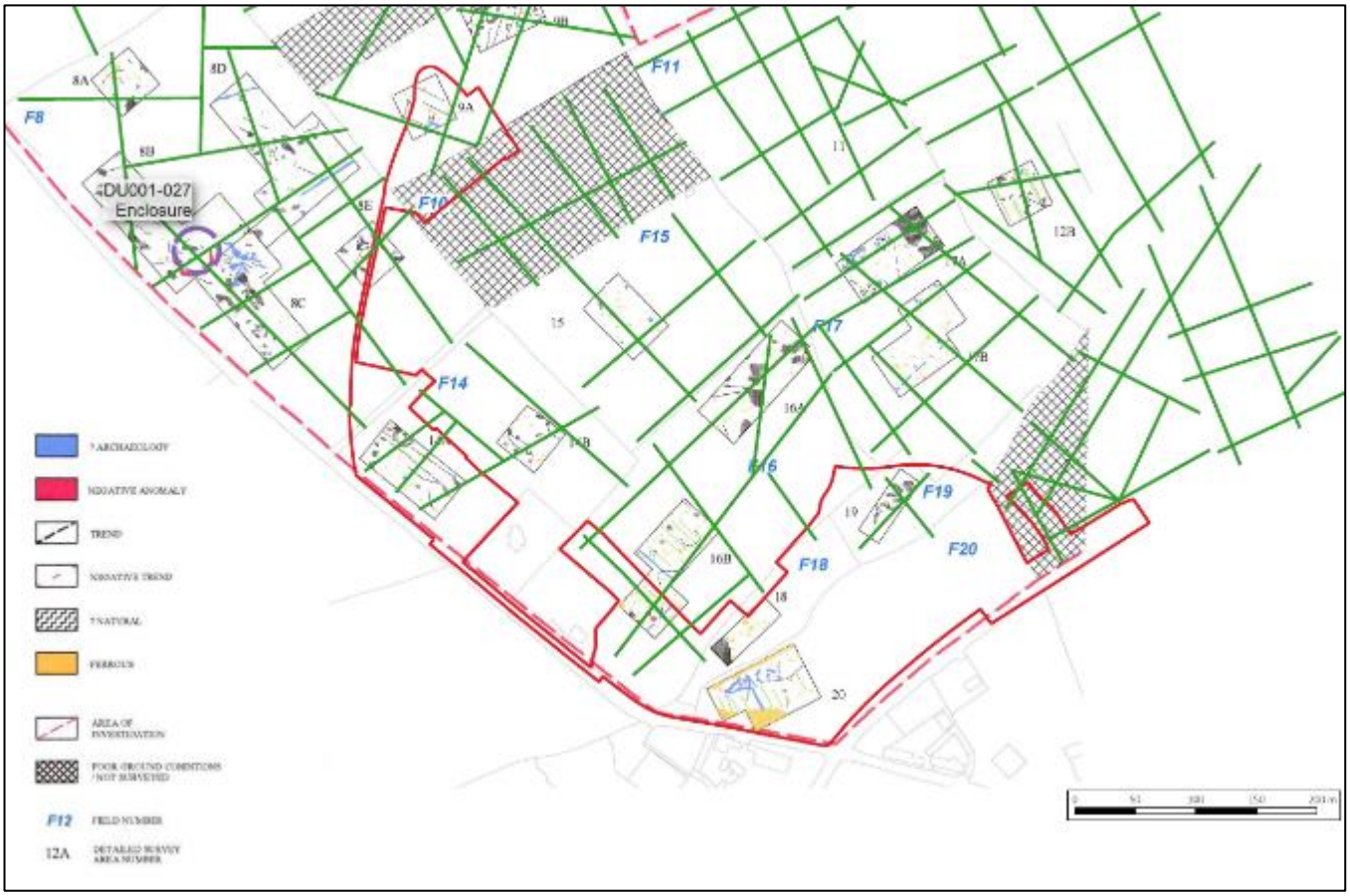
Pre-planning archaeological testing (Bennett 2021:074, Licence No. 21E0298) was carried out to the immediate north and northwest of the proposed development area in 2021. Testing confirmed the presence of substantial archaeological features in trenches T14-T20 inclusive, which corresponded with the concentration of anomalies representing field system DU001-023. No dateable finds were recovered from any of the investigated features, but the field system most likely dates to the early medieval period. Nothing of archaeological significance was revealed immediately adjacent to the proposed development area.

A programme of testing in association with a school development to the immediate north of the southern portion of the proposed development area, identified 26 features comprising prehistoric and medieval activity (Bennett 2015:372, Licence No. 15E0507). These features included a Mesolithic pathway, an early

Neolithic cremation pit, a Neolithic pit, a portion of an early Bronze Age ring barrow, a middle Bronze Age penannular enclosure, a middle Bronze Age burnt spread, a late Bronze Age *fulacht fia*, an Iron Age charcoal production pit and a medieval ditch with smithing activity, which were then excavated (Bennett 2016:150, Licence No. 15E0586). The southern portion of the ring barrow had been previously excavated in relation to the development of Boulevard Road (Bennett 2015:165, Licence No. 15E0558).

A geophysical survey was carried out in advance of the North-West Balbriggan northern Distribution Road, c. 75m to the southwest (Nicholls 2007, Licence No 07R0242). It returned responses of a possible burnt mound c. 165m to the south of the proposed development.

Figure 14.2: Location of previous geophysical survey and archaeological testing within the proposed development area



During 2008, archaeological testing as part of the Balbriggan Water Scheme was carried out c. 188m to the north of the proposed development area (Bennett 2008:379, Licence No. 07E1155). No archaeological features were identified; however, three archaeological areas, F003, 004/5, and 006, were uncovered within the wider area. The three areas contained two burnt mounds and two possible pit-type features, all of which had been previously discovered during testing under licence 07E0057. An extension to the licence carried out additional test-trenching (Bennett 2012:226, Licence No. 07E1155ext). This did not identify anything of archaeological significance.

A burnt mound (DU005-118) was identified during testing and excavated in advance of the Balbriggan Outer Relief Road, Phase 5, c. 287m to the southeast (Bennett 2007:445, Licence No. 07E0836; Bennett 2008:457, Licence No. 08E0055). Monitoring for the road (Bennett 2008:456, Licence No. 08E0005) failed to identify any further archaeological sites.

The enclosure (DU002-020), c. 346m to the east-northeast of the proposed development area was tested to define and characterise the RMP's zone of notification (Bennett 2017:238, Licence No. 17E0247). This

recovered late Bronze Age pottery from the inner enclosure ditch and identified peripheral features comprising a rectangular trough and six pits.

A programme of test trenching and a geophysical survey c. 336m to the north identified a number of archaeological features and deposits survey (Bennett 2005:487 Licence No. 05E0063; Leigh 2005, Licence No. 05R0114). These features consisted of a sub-square enclosure (DU001-024), a Neolithic house (DU001-014), an industrial site, a relict field system complex, a cluster of kilns (DU001-017), a metalworking site (DU001-016), and a multi-ditched enclosure (DU001-015). Additional testing was carried out in 2006 to provide more information on the exposed features (Bolger 2006). Excavation of the enclosures dated them to the early medieval period based on finds of several ring-headed pins Bennett 2006:658, Licence No. 05E0663). A Bronze Age burnt mound was also identified during these works.

A multi-period site was excavated c. 391m to the north of the proposed development area (Elliott 2007b, Licence No. 07E0361). The earliest feature on the site was a middle Bronze Age large curving ditch, which may have enclosed the hill it is situated on. Evidence of Bronze Age habitation truncated by medieval features was found within the area confined by this ditch. These features comprised small metalworking pits, two kilns, two rectangular structures, a hearth, a souterrain, ditches, and curvilinear features. Three investigations did not encounter anything of archaeological significance within the study area of the proposed development (Bennett 2016:007, Licence No. 14E0143; Nicholls and Shiel 2006, Licence No. 06R0188; Bennett 2014:212, Licence No. 14E0421).

14.3.3 CARTOGRAPHIC ANALYSIS

14.3.3.1 Sir William Petty, Down Survey, Barony of Balruddery, Parish of Balruddery, c. 1655

The area of the proposed development is located within the townlands of '*Big Foulkstonne'* and '*Fleiningtonne'* on the barony map or '*Great Fowcktowne*' and '*Flemming's-Towne'* on the parish map. No details are depicted within the site; however, a road that is orientated northwest-southeast is depicted traversing 'Great Fowcktowne' and continues north-south through '*Flemming's-Towne'*. This is likely to represent Clonard Road. The terroir records that the proprietor of the 180-acre townland of '*Great Fowcktowne*' was '*Peter Hufsey of Westowne'* and that the 265 acres of '*Flemingtowne'* were owned by Matthew Barnwell of Bremore.

14.3.3.2 John Rocque's Map of the City and County of Dublin, 1760

The scale of the proposed development is not entirely accurate on this map and the site is depicted within several open fields in proximity to Clonard Road. The Clonard Brook is shown within the southeastern portion of the proposed development area. There are several structures depicted along the road as well as a bridge indicated across the stream.

14.3.3.3 First Edition Ordnance Survey Map, 1843, scale 1:10,560 (Figure 14.3)

This is the first accurate historic mapping coverage of the area containing the proposed development. The overall site (northern, central and southern) is depicted within 10 fields. Five structures are located within the southeast portion of the proposed development area, adjacent to the road that borders the site to the southwest and either side of the Clonard Stream. A further group of structures are shown to the immediate south of the road and annotated as 'Clonard'. A bridge across the stream is indicated and gardens or an orchard are shown to the north of the structures, within the proposed development area. Although not labelled as such, it is possible the buildings relate to milling activity in the area given their location immediate to the stream.

14.3.3.4 Griffith's Valuation Map, Second Edition Ordnance Survey, 1871

By the time of this map, three of the structures either side of the Clonard Stream have been removed and only two remain, although the orchard or gardens to the north remain present. The structures to the south

of the road remain present and have been slightly expanded. The remaining surrounding fields are unchanged in form.

Figure 14.3: Extract from the first edition OS map (1843), showing the proposed development area

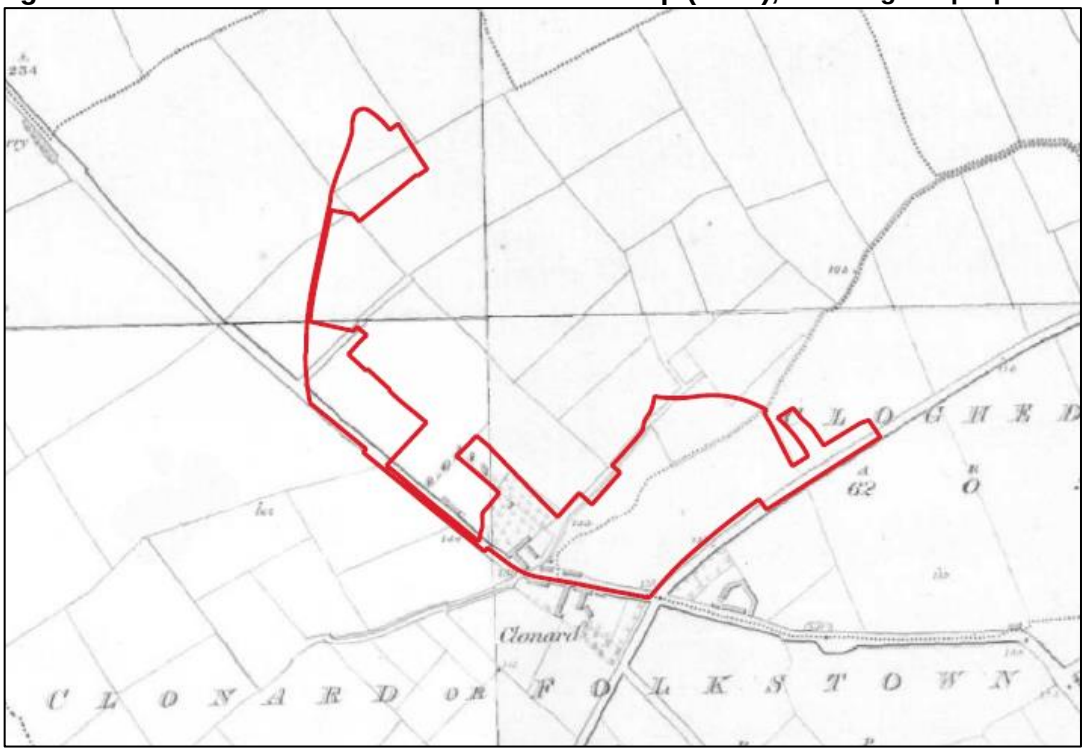
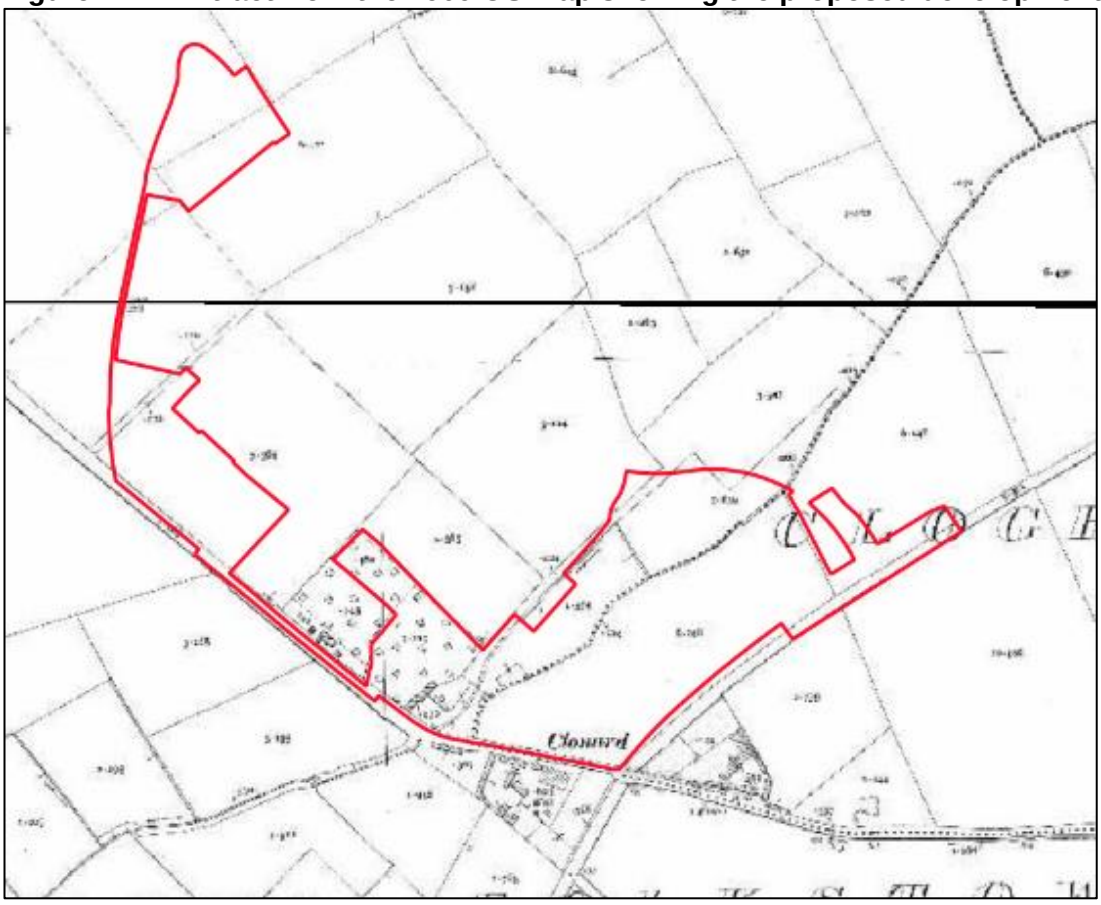


Figure 14.4: Extract from the 1909 OS map showing the proposed development area



14.3.3.5 Ordnance Survey Map, 1909, scale 1:2,500 (14.4)

There are no major changes to note within the cartography of this map that relate to the proposed development area.

14.3.4 COUNTY DEVELOPMENT PLAN

14.3.4.1 Record of Monuments and Places

The Fingal Development Plan 2023-2029, recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2004). The development plan lists a number of aims and objectives in relation to archaeological heritage.

There are no recorded monuments located within the proposed development area. The closest recorded monument comprises the site of a pit (RMP DU001-029) recorded c. 23m to the southeast of the northern portion of the proposed development area. An enclosure is located c. 115m to the west (RMP DU001-027 (Figure 14.1; Table 14.2). During 2024 the pit was determined to be natural during the course of archaeological monitoring.

Table 14.2: Recorded Archaeological Sites

RMP No.	Townland:	Classification	Distance from proposed development:
DU001-029	Clonard or Folkstown Great	Pit	c. 23m southeast
DU001-028	Clonard or Folkstown Great	Excavation - miscellaneous	c. 71m north
DU001-027	Clonard or Folkstown Great	Enclosure	c. 115m west
DU002-021	Clonard or Folkstown Great	Burnt spread	c. 200m north
DU001-014	Flemingtown	House - Neolithic	c. 243m northeast
DU005-117	Clogheder	Excavation – miscellaneous	c. 256m northeast
DU005-118	Clonard or Folkstown Great	Fulacht fia	c. 287m southeast
DU005-101	Clonard or Folkstown Great	Enclosure	c. 300m southeast
DU002-020	Clonard or Folkstown Great	Enclosure	c. 328m northeast
DU001-024	Flemingtown	Enclosure	c. 336m north
DU001-025	Flemingtown	Enclosure	c. 350m northwest
DU005-121	Clonard or Folkstown Great	Kiln - corn-drying	c. 370m southeast
DU001-026	Flemingtown	Excavation - miscellaneous	c. 378m northwest
DU001-017	Flemingtown	Kiln - corn-drying	c. 415m north
DU001-015	Flemingtown	Enclosure	c. 415m north
DU001-016	Flemingtown	Industrial site	c. 415m north
DU005-122	Clonard or Folkstown Great	Industrial site	c. 420m southeast

RMP No.	Townland:	Classification	Distance from proposed development:
DU005-120001	Clonard or Folkstown Great	House - medieval	c. 426m southeast
DU005-120002	Clonard or Folkstown Great	House - medieval	c. 441m southeast
DU005-119001	Clonard or Folkstown Great	House - Bronze Age	c. 444m southeast
DU005-119002	Clonard or Folkstown Great	House - Bronze Age	c. 449m southeast
DU001-023	Flemingtown	Field system	c. 463m north

14.3.4.2 Record of Protected Structures

The Fingal Development Plan 2023-2029 recognises the value of the built heritage and is committed to the protection and enhancement of this heritage by providing measures for the protection of architectural heritage. These include the establishment of a Record of Protected Structures (RPS) and the designation of Architectural Conservation Areas (ACAs).

There are no protected structures included on the RPS within 500m of the proposed development area.

14.3.5 NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE

14.3.5.1 Building Survey

A review of the architectural survey was undertaken as part of this assessment and included buildings within 500m. There are no NIAH structures within 500m of the proposed development area.

14.3.5.2 Garden Survey

The first edition Ordnance Survey map of County Dublin (1843) shows the extent of demesne landscapes as shaded portions of land within the study area. These were established as a naturalised landscaped setting for the large houses of the landed gentry. No demesne landscape has been recorded within the proposed development area based on the first edition Ordnance Survey map. The closest demesne landscape (Garden Survey 2186) is located c. 900m northeast of the southern site associated with Tankard Ville (RPS 0016; RMP DU002-011). This site is currently in use as Balbriggan Community Creche & Playschool.

14.3.5.3 Architectural Conservation Areas

An Architectural Conservation Area (ACA) is a place, area, group of structures or townscape, which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of a protected structure. An Architectural Conservation Area may or may not include protected structures. In an ACA, protection is placed on the external appearance of such areas or structures. The proposed development area is not located within an ACA and none are recorded in the 500m study area.

14.3.6 PLACENAME ANALYSIS

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on the history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830s and 1840s when the entire country was

mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main references used for the place name analysis are Irish Local Names Explained by P.W Joyce (1870) and Logainm.ie.

A description and possible explanation of each townland name in the environs of the proposed development area is provided in Table 14.3.

Table 14.3: Toponomy of local townlands

Placenames	Derivation	Possible Meaning
Clonard or Folkstown Great	*Cluain Ard nó Baile an Phúcaigh*	High lawn or meadow/ place of settlement
Clogheder	*Cloch Ruairí*	Eder's stone
Tankardstown	*Baile Thancaird*	Tinkers town
Bremore	*Brí Mhór*	The big brae, or hill
Flemingtown	*Baile an Phléimeannaigh*	Flemmings town
Balscaddan	*Baile Scadán*	Town of the herrings

14.3.7 TOWNLAND BOUNDARIES

The townland is an Irish land unit of considerable longevity as many of the units are likely to represent much earlier land divisions. However, the term townland was not used to denote a unit of land until the Civil Survey of 1654. It bears no relation to the modern word 'town' but like the Irish word baile refers to a place. It is possible that the word is derived from the Old English *tun land* and means 'the land forming an estate or manor' (Culleton 1999, 174).

Gaelic land ownership required a clear definition of the territories held by each sept and a need for strong, permanent fences around their territories. It is possible that boundaries following ridge tops, streams or bog are more likely to be older in date than those composed of straight lines (ibid. 179).

The vast majority of townlands are referred to in the 17th century when land documentation records began. Many of the townlands are mapped within the Down Survey of the 1650s, so called as all measurements were carefully 'laid downe' on paper at a scale of forty perches to one inch. Therefore, most are in the context of pre-17th century landscape organisation (McErlean 1983, 315).

In the 19th century, some demesnes, deer parks or large farms were given townland status during the Ordnance Survey and some imprecise townland boundaries in areas such as bogs or lakes were given more precise definitions (ibid.). Larger tracks of land were divided into a number of townlands and named Upper, Middle or Lower, as well as Beg and More (small and large) and north, east, south and west (Culleton 1999, 179). By the time the first Ordnance Survey had been completed a total of 62,000 townlands were recorded in Ireland.

The townland boundary between Clonard or Folkstown Great and Clogheder traverses the southern portion of the proposed development area. The townland boundary is largely intact and partially follows the trajectory of the Clonard Stream.

14.3.8 CULTURAL HERITAGE SITES

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architecture. However, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period.

No specific cultural heritage sites, with the exception of those sites described above, were identified during the course of this assessment.

14.3.9 TOPOGRAPHICAL FILES OF THE NATIONAL MUSEUM OF IRELAND

Information on artefact finds from the study area in County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area. No stray finds are recorded from within the proposed development area or the immediate environs.

14.3.10 AERIAL PHOTOGRAPHIC ANALYSIS

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2024) and Bing Maps revealed that the proposed development area remained largely as greenfield with the exception of the northern portion of the development area. The northern site experienced ground disturbance associated with the Taylor Hill development in 2019 (Google Earth, June 2019). Parts of the southern site experienced disturbance associated with a school development to the immediate north (February 2016). At this time Taylors Hill Boulevard within the development area was developed.

14.3.11 FIELD INSPECTION

The field inspection sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed development and its surrounding environs were inspected.

The southeastern portion of the proposed development area comprises all or parts of three fields bordered to the southeast by the Clonard Road and to the south by the Bridgefoot Road. Boulevard Road is located to the east and greenfield to the northwest. The largest field is relatively level and was under pasture at the time of the inspection (Plates 14.1/2). The field is surrounded by mature hedgerows and partially bounded on the northwest side by the Clonard Stream. The stream is flanked by very mature hedgerow and the stream channel itself was not visible at the time of the inspection.

The northern section of this area was subject to archaeological test trenching in 2007 and now comprises scrubby disturbed land. The western portion of the site slopes slightly to the southeast. This area was also subject to archaeological testing in 2007. Nothing of significance was identified. No evidence remains of the structures that were shown in this area on the historic OS maps.

The central portion of the proposed development area is located to the immediate east of the Bridgefoot Road and bordered to the southeast by a modern residence. The site was under pasture at the time of the inspection and slopes slightly to the southeast (Plate 14.3). This area was subject to archaeological testing in 2007 and nothing of archaeological potential was identified. A proposed road will connect this area to the northern portion of the proposed development area and this crosses the south-eastern portion of an arable field to the immediate north of the central development area.

The northern portion of the proposed development area has been stripped of overburden as part of permitted development in this area (Planning Ref.: F22A/0526, Plate 14.4). This work was subject to archaeological monitoring under licence and nothing of significance was identified (Whitaker 2024b, Licence No.: 23E0879).

Plate 14.1: South-eastern section of the development area, facing west-southwest

Plate 14.2: South-eastern section of the development area, facing east-northeast

Plate 14.3: Central portion of proposed development area, facing north

Plate 14.4: Overburden removal in the northern section of the proposed development area, facing north

14.3.12 GEOPHYSICAL SURVEY 2024

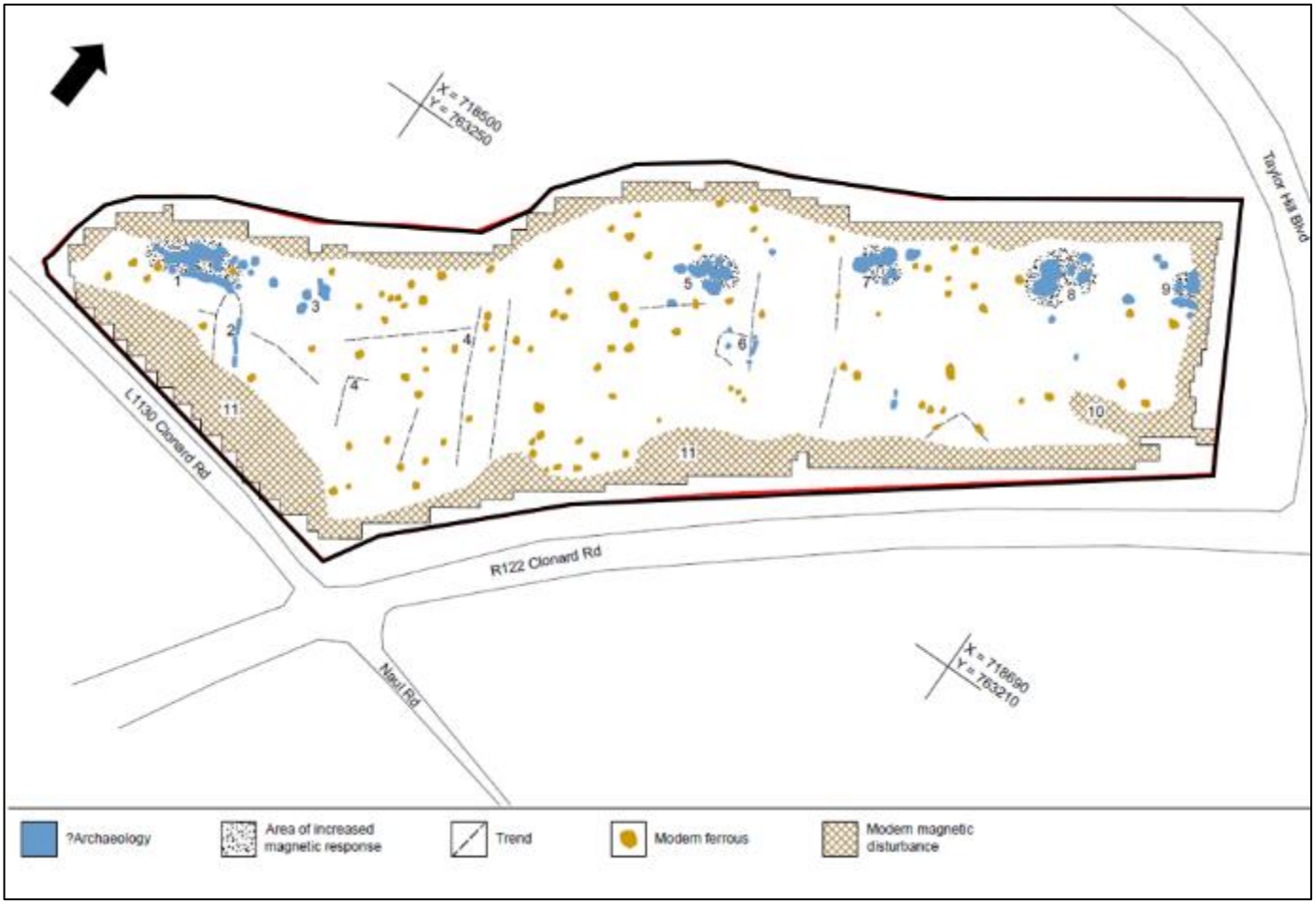
A geophysical survey was undertaken within the southern portion of the proposed development in January 2024 (Leigh 2024, Licence No. 24R0031, Appendix A 14.1, Figure 14.5 Volume III of the EIAR).

The survey identified nine anomalies. Anomalies 1 and 2 were located in the south-western portion of the survey area and whilst the anomalies possessed an amorphous pattern, they were interpreted as potentially representing plough damaged archaeological remains. Anomaly 3 is located just to the east and may represent pits associated with Anomalies 1 and 2.

Anomaly 4 represents a number of linear trends where an archaeological interpretation is cautious.

The remaining anomalies (5-9) were spread out across the area and interpreted as potentially representing the remains of burnt mounds, located to the southeast of the Clonard Stream.

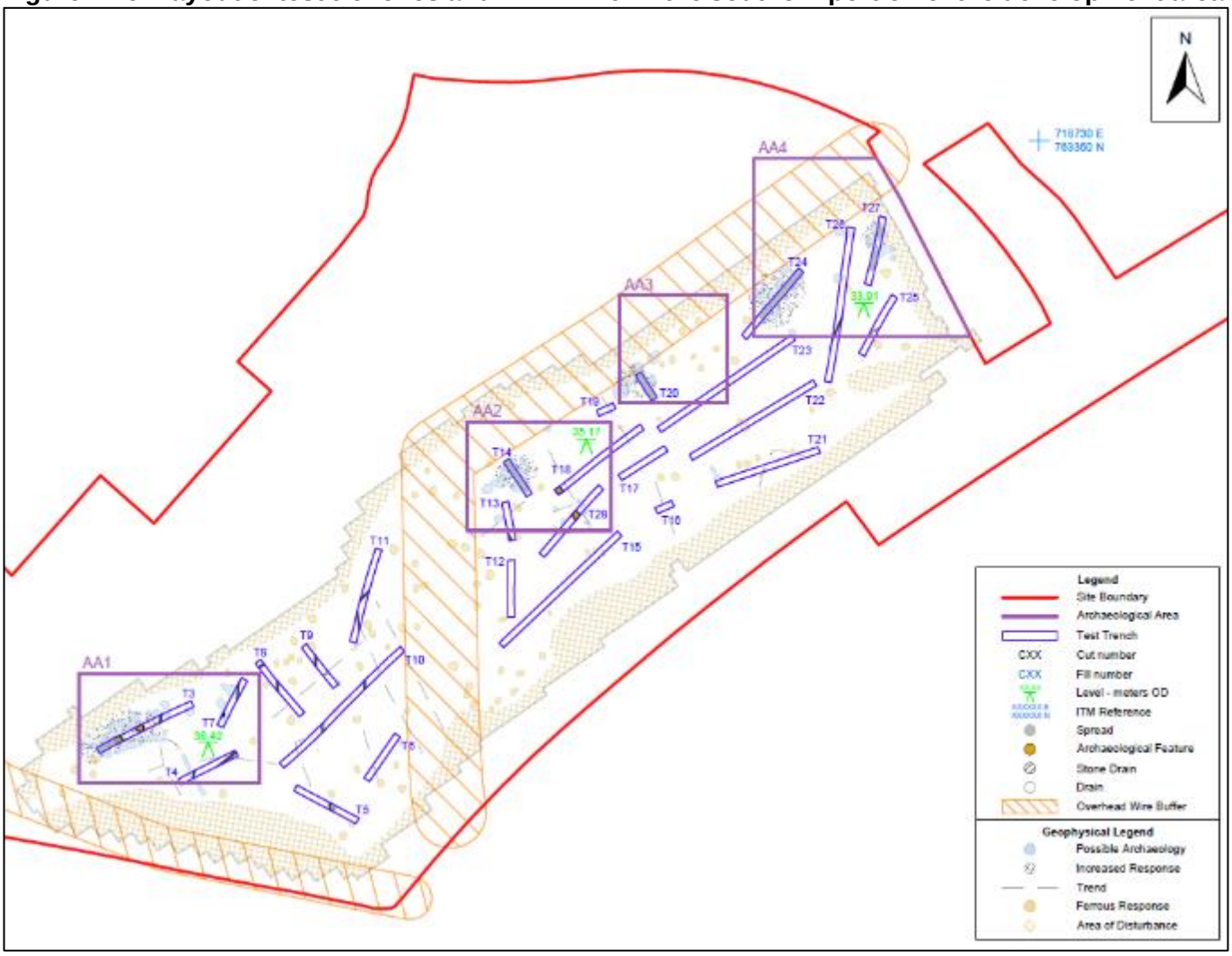
Figure 14.5: Result of 2024 geophysical survey within the southern portion of the development area



14.3.13 ARCHAEOLOGICAL TEST TRENCHING 2024

Archaeological test trenching was carried out within the southern portion of the proposed development area (previously unassessed) over the course of three days from 17th June 2024 using a mechanical excavator fitted with a flat grading bucket. The trenches targeted the geophysical anomalies and open green space in order to fully investigate the archaeological potential of the site. Testing revealed four areas of archaeological significance, which have been designated as Archaeological Areas 1-4 (Figure 14.6). These comprised evidence for probable Bronze Age burnt mound activity along the northwestern boundary of the field, in close proximity to an existing watercourse (Appendix A 14.2 Volume III of the EIAR). This is a typical landscape context for this site type, which is the most commonly identified archaeological site within the terrestrial record.

Figure 14.6: Layout of test trenches and AA1-4 within the southern portion of the development area



14.3.13.1 Archaeological Area 1 (AA1) 50 x 30m

Geophysical anomalies in the western extent of the development site were confirmed as burnt mound activity. Two possible troughs (C3.1 and C3.2) 1.80 by 1.90m in size and 0.28m and 0.22m in minimum depth and a burnt spread (C3.1) were identified in Trench 3. Trench 7 contained a pit (C7.1) 0.90 x 0.54m in minimum size and containing burnt mound material. The remains are likely to be representative of Bronze Age burnt mound/ *fulacht fia* activity.

14.3.13.2 Archaeological Area 2 (AA2) 40 x 30m

The entire base of Trench 14 contained a burnt spread likely to be representative of Bronze Age burnt mound / *fulacht fia* activity. Trenches 18 and 28 contained a northwest southeast oriented linear ditch (C18.1 and C28.1) 1.60m wide, 0.52m deep with steep sides to a flat base 0.70m wide.

14.3.13.3 Archaeological Area 3 (AA3) 30 x 30m

The southeastern half of Trench 20 contained burnt spread material (C20.1). Overhead power lines to the north of Trench 20 limited investigation of the potential archaeological material identified by geophysical survey but is contained within this Archaeological Area.

Archaeological Area 4 (AA4) 60 x 30m
Archaeological Area 4 is located immediately east of AA3 and contained a large burnt spread (C24.1) 18.5m in length within Trench 24. A possible trough (C27.1) 1.90m in length and a minimum of 1.80m wide and another burnt spread (C27.2) 4.20m in length were recorded within Trench 27.

14.4 SUMMARY

The proposed development area is located within the townlands of Clogheder and Clonard or Folkstown Great, Parish of Balrothery and Barony of Balrothery East, County Dublin. It is situated c. 1.5km west of the centre of Balbriggan and located within lands that are zoned for residential development within the Fingal County Development Plan (2023-2029).

There are no recorded monuments located within the proposed development area. The closest recorded monument comprises the site of a pit (RMP DU001-029) recorded c. 23m to the southeast of the northern site. This site has since been subject to further archaeological investigation and was found to be natural. An enclosure, likely to represent an early medieval ringfort, is located c. 115m to the west (RMP DU001-027). There are no protected structures located within 500m of the proposed development area. Similarly, no structures listed within the National Inventory of Architectural Heritage are located within 500m**.**

Cultural heritage features within the proposed development area include the townland boundary between Clonard or Folkstown Great and Clogheder traversing the southern site. The townland boundary is largely intact and partially follows the route of the Clonard Stream.

A review of the Excavations Bulletin (1970–2024) has revealed that a geophysical survey was carried out within portions of the proposed development area, followed by an extensive programme of archaeological testing in 2007. This work identified 38 varied archaeological sites including enclosures, pits, linear features, and burnt spreads across the wider landscape, including the enclosure (DU001-027) located to the west. None of the sites identified were located within the proposed development area.

An inspection of the cartographic sources revealed that the proposed development area occupied a rural landscape throughout the post-medieval period. The Clonard Stream traverses a portion of the development area (southern site) and forms part of the townland boundary between Clonard or Folkstown Great and Clogheder. The small settlement of Clonard is also partially within the southeastern extent of the proposed development comprising a number of structures marked on either side of the stream within the historic Ordnance Survey maps. Structures at this location may have related to milling activity, but they have since been removed from the landscape.

Analysis of the aerial photographic coverage of the site failed to identify any previously unrecorded sites within the lands. The northern site experienced ground disturbance associated with the Taylor Hill development in 2019 while the northern extent of the southern site experienced disturbance associated with a school development to the immediate north.

A field inspection has been carried out as part of the assessment. This failed to result in the identification of any previously unrecorded sites of archaeological, architectural or cultural heritage potential. The stream within the southern portion of the proposed development area possesses some archaeological potential, due to the fact that such landscape features often attract activity settlement.

A geophysical survey has been carried out within the previously un-investigated part of the southern site (Leigh 2024, Licence No. 24R0031). This confirmed potential archaeological anomalies that may represent the remains of burnt mounds, adjacent to the stream. Archaeological testing was carried out in this area in June 2024 and identified four potential archaeological sites representative of probably Bronze Age burnt mound or *fulacht fia* activity.

14.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 197 no. dwellings along with 1 no. retail/café unit and 1 no. retail/medical unit consisting of 129 no. houses, 18 no. townhouses, 16 no. duplex dwellings, 4 no. apartments, 12 no. maisonette apartments and 18 no. later living dwellings all on a 3 parcel site of c. 7.15 hectares. access, infrastructure, car parking, open space, boundary treatments and all associated site development works (Figure 14.7).

Figure 14.7: Plan of proposed development showing the location of AA1-4

14.6 POTENTIAL EFFECT OF THE PROPOSED DEVELOPMENT

14.6.1 CONSTRUCTION PHASE

14.6.1.1 Archaeology

Four areas of archaeological significance were identified during the course of archaeological testing within the southern portion of the development area. These all relate to probable burnt mound activity. Due to the layout requirements for the proposed development, including access roads, services and residential units (along with the provision of a green corridor for the existing stream) it is not possible to preserve the archaeological remains in-situ (Figure 14.7). As such ground disturbances associated with the development will result in a direct, negative and permanent impact on AA1-4. Prior to the application of mitigation, the significance of effect is predicted to be very significant.

The Clonard Brook traverses a portion of the development area (southern site) and also forms part of the townland boundary between Clonard or Folkstown Great and Clogheder. This stream will be preserved as part of the development but will be crossed by two access roads and three footpaths. Works associated with these crossing have the potential to result in direct, negative and permanent impacts on previously unrecorded archaeological remains or artefacts that have the potential to survive within the channel. Effects may range from moderate to very significant, dependant on the nature, extent and significance of any remains that may be present.

It is possible that small or isolated archaeological features survive beneath the current ground level outside of the footprint of the excavated test trenches (with the exception of the northern portion of the site where works have already been monitored). Ground disturbances associated with the development may result in a direct, negative and permanent impact on any such remains. Prior to the application of mitigation, the significance of effect may vary from moderate to very significant. This is dependent on the nature, extent and significance of any remains that may be identified.

14.6.1.2 Architectural

No potential negative impacts upon the architectural resource are predicted as a result of the construction of the proposed development.

14.6.1.3 Cultural Heritage

No potential negative impacts upon the cultural heritage resource (with the exception of those detailed above) are predicted as a result of the construction of the proposed development.

14.6.2 OPERATIONAL PHASE

No impacts during the operational phase are predicted upon the archaeological, architectural, and cultural heritage resource.

14.7 '*DO-NOTHING*' IMPACT

If the proposed development were not to proceed there would be no negative impact on the archaeological, architectural, or cultural heritage resource of the subject lands or cumulatively with other development.

14.8 AVOIDANCE, REMEDIAL, AND MITIGATION MEASURES

14.8.1 CONSTRUCTION PHASE

14.8.1.1 Archaeology

It is acknowledged that preservation in-situ of archaeological remains is the preferred method in which to conserve the archaeological resource. However, due to the requirements of the proposed development, this is not possible. Therefore, prior to the commencement of construction, the four archaeological areas will be subject to preservation by record (archaeological excavation). This will be carried out by an archaeologist under licence from the DoHLGH.

Prior to the commencement of construction, an archaeological wade survey will be carried out on sections of the Clonard Stream, which will be impacted by the construction of road and footpath crossings. This will be carried out by an underwater archaeologist under licence from the National Monuments Service of the DoHLGH. Dependant on the results of the survey, further mitigation may be required, such as preservation by record, or in-situ and/or archaeological monitoring.

All topsoil stripping associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

14.8.1.2 Architectural

As there are no predicted impacts on the architectural resource, no mitigation is deemed necessary.

14.8.1.3 Cultural Heritage

As there are no predicted impacts on the cultural heritage resource (with the exception of those described in relation to archaeological heritage), no mitigation is deemed necessary.

14.8.2 OPERATIONAL PHASE

As there are no predicted impacts on the archaeological, architectural, or cultural heritage resource during the operational phase, no mitigation is deemed necessary.

14.8.3 '*WORST-CASE*' SCENARIO

Under a worst-case scenario, the proposed development would disturb previously unrecorded and unidentified archaeological deposits and artefacts without proper excavation and recording being undertaken.

14.9 PREDICTED IMPACTS (EFFECTS) OF THE PROPOSAL

14.9.1 CONSTRUCTION PHASE

Following the implementation of mitigation measures, no significant impacts are predicted upon the archaeological resource.

No impacts are predicted upon the architectural or cultural heritage resource as a result of the construction of the proposed development.

14.9.2 OPERATIONAL PHASE

There are no impacts predicted upon the archaeological, architectural or cultural heritage resource as a result of the operation of the proposed development.

14.10 MONITORING

The mitigation measures detailed above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the mitigation measures.

14.11 REINSTATEMENT

Reinstatement is not applicable.

14.12 POTENTIAL CUMULATIVE IMPACTS/EFFECTS

Other projects in the wider area include:

- Previous phases of the masterplan site: Phase 3A, Phase 3B and Phase 3C Ladywell;
- Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and
- Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

No cumulative impacts are predicted upon the archaeological, architectural, or cultural heritage resource as all archaeological remains within the proposed development area will be preserved by record.

14.13 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

No difficulties were encountered during the compilation of this chapter.

14.14 REFERENCES

Bennett, I. (ed.) 1987-2010. Excavations: Summary Accounts of Archaeological Excavations in Ireland. Bray. Wordwell.

Bolger, T. 2006. Archaeological Test Excavation and Archaeological Monitoring. Flemington, Balbriggan, County Dublin (Licence No. 05E0663). Unpublished report by Margaret Gowen & Co. Ltd.

Bolger, T. 2009. Archaeological excavations at Flemington, Balbriggan. In C. Baker (ed.), Axes, Warriors and Windmills: Recent archaeological discoveries in North Fingal. Fingal County Council.

Bhrethnach, E. 1999. 'Authority and Supremacy in Tara and its Hinterland c. 950-1200' in Discovery Reports 5. RIA, Dublin:1-24.

Byrne, F. J. 1973. Irish Kings and High Kings. Dublin. Four Courts Press.

Cahill Wilson, J. 2014. Late Iron Age and Roman Ireland, Discovery Programme Report Series No. 8, Discovery Programme. Dublin. Wordwell.

Carroll, J. 2008. Archaeological Excavations at Rosepark, Balrothery, Co. Dublin Vol. 1. Heritage Council.

Chartered Institute for Archaeologists 2014 (updated 2020). Standard and guidance for historic environment desk-based assessment.

Culleton E. (ed.) 1999. Treasures of The Landscape; Townland Names by An Tathair Seamas S. De Vaal Dublin: Trinity College.

Department of Arts, Heritage, Gaeltacht and the Islands. 1999a. Framework and Principles for the Protection of the Archaeological Heritage. Dublin. Government Publications Office.

Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. Policy and Guidelines on Archaeological Excavation. Dublin. Government Publications Office.

Dowd, M. and Carden, R.F. 2016. First evidence of a Late Upper Palaeolithic human presence in Ireland. Quaternary Science Reviews 139, 158-163.

Elliot, R. 2007a. Archaeological Testing at Balbriggan, Co. Dublin. Preliminary Report (Licence No. 07E0057). Unpublished report prepared by The Archaeology Company.

Elliot, R. 2007b. Archaeological Testing at Balbriggan, Co. Dublin (Licence No. 07E0361). Unpublished report prepared by The Archaeology Company.

Environmental Protection Agency. 2017. Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Dublin. Government Publications Office.

Environmental Protection Agency. 2022. Guidelines on the Information to be Contained in Environmental Impact Statements. Dublin. Government Publications Office.

Fingal County Development Plan, 2023-2029.

Hawkes, A. 2018. The Archaeology of Prehistoric Burnt Mounds in Ireland. Oxford. Archaeopress.

Kavanagh, H. 2010. Final archaeological report on the excavation of Area 2/3 at Folkstown Great or Conard, Balbriggan, Co. Dublin (Licence No. 08E0854). Unpublished report by Irish Archaeological Consultancy Ltd.

Leigh, J. 2005. Geophysical Survey Report Flemington, Balbriggan, County Dublin (Licence No. 05R0114). Unpublished report prepared by J. M. Leigh Surveys Ltd.

Leigh, J. 2024. Geophysical Survey Report Clogheder, Balbriggan, County Dublin (Licence No. 24R0031). Unpublished report prepared by J. M. Leigh Surveys Ltd.

McErlean, T. 1983. ‘The Irish townland system of landscape organisation’, in Reeves-Smyth, T. Hamond, F. Landscape Archaeology in Ireland. BAR British Series 116. pp. 315–39.

McGlade, S. 2016. Excavations at Clonard or Folkstown Great, Balbriggan, Co. Dublin (Licence No. 15E0586). Unpublished report by Archaeological Planning Consultancy.

National Monuments Service, Department of Housing, Local Government and Heritage. Sites and Monuments Record, County Dublin.

National Museum of Ireland. Topographical Files, County Dublin.

Nicholls, J. and Shiel, D. 2005. Geophysical Survey Report: Balbriggan, North County Dublin (Licence No. 05R0137). Unpublished report prepared by Target Archaeological Geophysics.

Nicholls, J. 2007. Geophysical Survey Report: North-West Balbriggan The northern Distribution Road. Clonard or Folkstown Great Townlands, North Co. Dublin (Licence No. 07R0242). Unpublished report prepared by Target Archaeological Geophysics.

O’Carroll, F. 2009 ‘Bremore, Co. Dublin, the Field by the Castle’ in Baker, C. (ed) Axes, Warriors and Windmills: Recent Archaeological Discoveries in North Fingal Fingal County Council.

O'Sullivan, A., McCormick, F., Kerr, T.R., Harney, L. 2014. Early Medieval Ireland, AD 400-1100: The Evidence from Archaeological Excavations. Dublin. Royal Irish Academy.

Stout, M. 2017. Early Medieval Ireland 431-1169. Dublin. Wordwell.

Stout, M. 1997. The Irish Ringfort. Dublin. Four Courts Press.

Stout, G. and Stout, M. 1997. Early Landscapes: from Prehistory to Plantation. In F.H.A. Aalen et al. (eds), Atlas of the Irish Rural Landscape. Cork. Cork University Press.

Waddell, J. 2022. The Prehistoric Archaeology of Ireland (New Edition). Dublin. Wordwell.

Cartographic Sources

Sir William Petty, Down Survey, Barony of Balruddery, Parish of Balruddery, c. 1655

John Rocque, Map of the City and County of Dublin, 1760

Ordnance Survey maps of County Dublin, 1843, 1871, 1909

Electronic Sources

www.excavations.ie – Summary of archaeological excavation from 1970-2024.

www.archaeology.ie – DoHLGH website listing all SMR/RMP sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.

www.geohive.ie – Ordnance Survey Ireland National Townland and Historical Map Viewer (including Aerial imagery 1995, 2000, 2005 and 2013).

www.googleearth.com – Satellite imagery (2005–2024).

www.apple.com/maps/ - Satellite imagery (2024).

www.logainm.ie – Placenames Database of Ireland, developed by Fiontar (DCU) and The Placenames Branch (DoTCAGSM).

15.0 RISK MANAGEMENT FOR MAJOR ACCIDENTS AND/OR DISASTERS

15.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included '*Risk Management'* as a new chapter to be addressed. Article 3 of the new EIA Directive requires that the EIA shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage, and landscape deriving from (amongst other things) the *"vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned".*

The Planning and Development Regulations 2001, as amended, Schedule 6 paragraph 2(h) indicate that it may be appropriate to furnish additional information in relation to the following:

"(h) a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events."

The chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them.

This chapter was prepared by Eamonn Doran MRIAI / RIAI PSDP Accredited, of Doran Cray Architects who are registered architectural practice.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment

15.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed development has been designed and will be constructed in line with best practice and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Flood Risk Assessment, prepared by Paul McGrail Consulting Engineers, was carried out. Measures to control risks associated with Construction Phase activities are incorporated into the Construction and Environmental Management Plan, prepared by Paul McGrail Consulting Engineers, contained in Appendix D Volume III of the EIAR.

The following sections set out the requirements as stated in the new EIA Directive and in the EPA Guidelines 2022 on the information to be contained in an Environmental Impact Assessment Report (EIAR). The scope and methodology presented is based on the new EIA Directive, the EPA guidelines, on other published risk assessment and on professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. A risk analysis based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

Recital 15 of the EIA Directive states that:

"In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU."

The intent of the directive is that a major accident and/or natural disaster assessment should be mainly applied to COMAH (Control of Major Accident Hazards involving Dangerous Substances) sites or nuclear installations. The proposed development in this instance is residential development on a greenfield site which when completed, will not give rise to ongoing significant risks in its operating environment.

The 2022 EPA Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections, as follows:

Characteristics of the Project – the guidelines state that the project characteristics should include *"a description of the Risk of Accidents – having regard to substances or technologies used."*

Impact assessment - the guidelines state that the impact assessment should include "*the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Likelihood of Impacts - the guidelines state the following:

"To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g., a COMAH assessment."

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include the Construction Environmental Management Plan, which would deal with pollution risks during construction (See Chapters 5, 6 and 8 on Land, Soils, Water and Air) and risk of accidents during construction, including traffic accidents. The risk of flooding is dealt with in Chapter 6; Water. There is no risk of flooding within the site. Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

15.2.1 SITE SPECIFIC RISK ASSESSMENT METHODOLOGY

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010), as follows:

Table 15.1: Risk Classification

Table 2 - Classification of Likelihood

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communicates; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

15.2.2 HAZARD IDENTIFICATION

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists. Therefore, the risks set out below are considered the most relevant potential risks, with the likelihood identified from extremely unlikely (1) to very likely (5).

A risk matrix can be prepared against which the proposed development can be tested.

Table 15.2 – Risk Matrix

Likelihood Rating						
	Very likely	5				
	Likely	4				
	Unlikely	3				
	Very unlikely	2				
	Extremely Unlikely	1				
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

Table 15.3: Risk Likelihood

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	3
Hydrological	Risk from flooding	1
Excavation work	Collapse	3
Road	Traffic accident	4
Industrial accident	General housebuilding construction	1
Explosion	General Construction materials no explosive products used.	1
Fire	Hot works close to timber frame structures.	3
Building Collapse	Structural failure during construction.	1

Hazardous substance escape	General housebuilding construction products.	2
Pollution	Construction	3

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, Fingal County Council have in place a 'Major Emergency Plan' which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

15.3 RECEIVING ENVIRONMENT

The surrounding context consists of a mix of residential and agricultural. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

Article 3 of the Environmental Impact Assessment (EIA) Directive 2014/52/EU requires the assessment of expected effects of major accidents and/or disasters within an EIA. Article 3(2) of the Directive states that *"The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned".*

15.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The project relates to a Large-Scale Residential Development (LRD) of 197 residential units (147 no. houses/townhouses, 18 no. later living dwellings, 16 no. duplex units and 16 no. apartments) to be known as 'Phase 4' 'Folkstown', within the townlands of 'Clonard or Folkstown Great', and 'Clogheder', Balbriggan, Co. Dublin A full description is set out in chapter 2 of the EIAR.

15.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT (ASSESSMENT OF EFFECTS)

15.5.1 HEALTH & SAFETY/ RISKS OF MAJOR ACCIDENTS AND/OR DISASTERS

15.5.1.1 Construction Phase

It is considered that the main risks associated with the proposed development will arise during the construction phase.

Health & Safety/ Risks of Major Accidents and/or Disasters

- Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.
- Risk of falling into open excavations.
- Risk of burial under earthfalls in basement excavations.
- Risk of injury from falling tools / construction materials during construction phase.
- Risk of electrocution / flooding during the foundation works. Any work around existing services.
- Risk of injury during the assembly of precast columns, stairs, façade panels, etc.

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may

include resulting increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites. Potential spillage (diesel and petrol) have the potential to occur.

Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through the Contractor's Construction & Environmental Management Plan which will include the mitigation contained in this EIAR. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced.

15.5.2 OPERATIONAL PHASE

The main risk identified during operation is the risk of fire. It should be noted that the proposed uses are considered normal hazard fire risks as would be encountered in most residential developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from Fingal County Council.

The measures will include inter alia:

- Provision of fire-rated walls and floors to restrict the spread of fire within and between buildings in accordance with relevant design guidance e.g. Technical Guidance Document B, BS9991, and BS9999. These measures will, in conjunction with the provision of automatic fire suppression in the taller blocks, serve to control/limit the size of conflagrations;
- Provision of early warning fire detection systems to ensure the earliest possible intervention in the event of fire occurrence;
- Use of materials which do not support fire spread with particular reference, inter alia, to internal wall and ceiling linings and external wall cladding.
- Facilities to assist the fire service including fire tender access proximate to all units, dry rising mains, and external fire hydrants
- A bespoke Fire Emergency Evacuation Plan [FEEP] will be prepared for the apartment, duplex blocks and retail spaces in advance of occupation.
- The cleaning of windows in the buildings will be undertaken by a specialist contractor on behalf of the owners management company. Window cleaning infrastructure has been designed into the scheme.
- Public lighting has been designed and incorporated as part of the scheme to ensure areas are well light for public use minimising risks to pedestrians and road users. A road safety and quality audit has also been undertaken to ensure potential risks to pedestrians and road users are designed out.

15.5.3 '*DO NOTHING*' SCENARIO

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and / or accident would be low, given that the site is currently an undeveloped greenfield site.

15.6 MITIGATION MEASURES

The Construction Environmental Management Plan (contained in Appendix D Volume III of the EIAR) and the Health and Safety Plan (which will be developed and included in the final Contractor's CEMP) will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations. The CEMP along with the mitigation measures contained in this EIAR will be implemented as part of the construction of the project.

The proposed development will involve the ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. Further site investigation and WAC (Waste Acceptance Criteria) testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licenced facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.

- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.

- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.

- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.

- With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site-Specific Flood Risk Assessment, prepared by MPA Consulting Engineers. The site is located in Flood Zone C where development and is not at risk of fluvial, pluvial or groundwater flooding.

- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.

- Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.

- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.

- Safety briefings will be held regularly and prior to any onerous or special task. *'Toolbox talks'* will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 15.4: Strategy for tackling potential risks.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (I) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium) ; or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
1	Work which puts persons at risk of:-burial under earth falls. Risk of burial under earthfalls in trenches.	Project Supervisor Construction Stage (PSCS)	H	M	Contractor to address requirement for trench support. Excavations are to be carried out at safe slope. Refer to site investigation for same and temporary works engineer to design.
2	Scaffolding Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission,

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.
3	Fire Strategy Risk of fire damage to houses or to partially complete new apartment blocks from construction activities.	PSCS/ PSDP / Fire SC.	H	M	Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required.
4	Lifting Operations Work involving the assembly or dismantling of heavy pre-fabricated components. Risk of injury during the assembly of precast columns, stairs, façade panels, etc.	PSCS/PSDP	H	M	Lifting operations using cranes will be a requirement during the project. The PSDP must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.
5	Existing Utilities Work near overhead electric cables, risk of Electrocution	PSCS/PSDP	H	M	The PSDP must highlight the existence of live overhead ESB cables on site. The sequence of work to be planned to avoid working in close proximity to the lines. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					practice and provide a risk assessed RAMS document to manage this hazard.
6.	Construction Traffic Working adjacent to live construction and normal traffic.	PSCS/PSDP	H	M	Contractor to prepare and implement a Construction Traffic Management Plan to be agreed with the design team to ensure public safety. The contractor is to supervise vehicle movements during construction and enforce the traffic management plan.

15.7 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

A Risk Register has been developed which contains the main risks identified with the construction and operation of the Proposed Project. These have been identified as follows:

Table 15.5: Risk Register

Risk No.	Risk Event	Possible Cause
1	Accidents during construction	Traffic accident Interaction with moving plant. Working at height /scaffolding Risk of fire Groundwater pollution Noise Dust
2	Fire during Construction	Work with timber frame construction. Hot works requirements for gas installation, balconies and roof work.
3	Lifting Operations	High winds Poor ground conditions Untrained personnel. Failures in lifting gear.
4	Fire following occupation	Inappropriate use of electrical devices / cooking etc.
5	Falls	Window cleaning

15.7.1 RISK ANALYSIS

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e. the consequences versus the likelihood of the event taking place.

Table 15.6: Risk Analysis

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score
1a	Accidents during construction	Movement of vehicles	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1b		Manual handling	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1c		Slips or falls	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1d		Ground water pollution	Impact on aquatic life, illness	1	Lack of direct pathways, controls of run-off during construction	3	Could result in environmental pollution	3
2a	Fire during Construction	Hot Works	Fire Loss of life	3	Type of construction	3	Fire could result in loss of life	3
3a	Lifting Operations	Poor planning	Loss of life	3	Construction Statistics.	3	Poor planning could result in failure of lifting gear or cranes.	9
4	Fire following occupation	Electrical equipment / cooking	Injury or loss of life	1	Causes of fire statistics	3	Could result in loss of life	3
5	Falls	Loss of balance	Injury or loss of life	1	CSO statistics	3	Could result in loss of life	3

15.7.2 RISK EVALUATION

Taking the above table, and applying it below, the red zone represents 'high risk' scenarios', the amber zone represents '*medium risk scenarios'* and the green zone represents 'low risk scenarios.'

Table 15.7: Risk Evaluation

Likelihood Rating							
	Very Likely	5					
	Likely	4					
	Unlikely	3			1a – 9, 1b – 9 1c – 9, 1d – 3 4 – 3, 5 - 3		
	Very Unlikely	2					
	Extremely Unlikely	1				2a - 3	
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

15.7.3 MAIN RISKS

The man risks arise during the construction period. Consequences may be limited but severe for the individuals concerned. Geographical widespread environmental consequences are not anticipated.

15.8 MONITORING

Monitoring will occur as per the Contractor's CEMP. No monitoring is required during the operational phase.

15.9 INTERACTIONS

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

15.10 RESIDUAL IMPACTS

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects.

15.11 CUMULATIVE IMPACTS

The cumulative interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

Other projects in the wider area include:

- Previous phases of the masterplan site: Phase 3A, Phase 3B and Phase 3C Ladywell;
- Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and
- Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

Works on the public road, such as the construction of the signalised junction on the Boulevard Road / Clonard Road (R122) and the laying of underground pipes would be carried out on behalf of the relevant statutory undertakers, and would be subject to separate construction management plans. This would apply to the construction of the development to the north of the subject site, which would have their own Construction Management Plan to mitigate potential impacts.

16.0 INTERACTIONS OF THE FORGOING

16.1 INTRODUCTION

'The purpose of this chapter is to highlight the significant interaction between environmental factors, and the cumulative impact this interaction and the proposed development has on the receiving environment. In preparing the EIAR each of the specialist consultants have and will continue to liaise with each other and will consider the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject site and this ensures that mitigation measures are incorporated into the design process.

Article 3(1) of the EIA Directive (2014/52/EU) states that:

The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: a) population and human health; b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; c) land, soil, water, air and climate; d) material assets, cultural heritage and the landscape; e) the interaction between the factors referred to in points (a) to (d).'

As this EIAR document has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration.

Rory Kunz has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has over 21 years of experience of Environmental Impact Assessment and urban development.

Having regard to the approach taken, the aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant Chapters of this EIAR document.

The relevant consultants liaised with each other and the project architects, engineers, and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

16.2 INTERACTIONS

Section 3.7.2 of the EPA Guidelines 2022 states that the interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. The EPA Guidelines further note that:

"It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. This is usually done using the actual headings used in the EIAR (which may differ from the factors contained in the Directive (ref section 3.3.6). This is typically accompanied by text describing the interactions."

Table 16.1: Matrix of Summary of interactions between the environmental factors

Interaction	Population & Human Health	Biodiversity	Land and Soils	Water	Air Quality/Climate	Noise/Vibration	Landscape and Visual	MA-Traffic	MA-Waste/Utilities	Cultural Heritage	Risk Mgmt
Population & Human Health		✗	✗	✗	✓	✓	✓	✗	✓	✗	✓
Biodiversity	✗		✓	✓	✗	✗	✗	✗	✓	✗	✗
Land and Soils	✗	✓		✓	✓	✗	✗	✓	✓	✓	✗
Water	✓	✗	✓		✗	✗	✗	✗	✓	✗	✗
Air Quality/Climate	✓	✓	✗	✓		✗	✗	✓	✗	✗	✗
Noise/Vibration	✓	✓	✗	✗	✗		✗	✓	✗	✗	✗
Landscape and Visual	✓	✓	✗	✗	✗	✓		✗	✗	✗	✗
MA-Traffic	✓	✗	✓	✗	✓	✓	✗		✗	✗	✓
MA-Waste/Utilities	✓	✓	✓	✓	✓	✓	✗	✓		✗	✗
Cultural Heritage	✗	✗	✗	✗	✗	✗	✗	✗	✗		✗
Risk Mgmt	✓	✗	✓	✓	✓	✓	✗	✓	✗	✗	

✓ Interaction ✗ No Interaction

The following provides the interactions anticipated from the proposed development:

16.2.1 CHAPTER 3 POPULATION AND HUMAN HEALTH

The potential significant impacts on population and human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

16.2.1.1 Population and Human Health (Ch 3) - Air Quality/Climate (Ch 7/Ch8)

The completed development will generate additional emissions to the atmosphere associated with the development, and due to plant equipment within the development.

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. However, dust control measures, as set out in chapter 7 which includes a range of measures such as wheel washes and covering of fine materials will minimise the impact on air quality.

The effect of construction on air quality will not be significant following the implementation of the proposed mitigation measures. It is proposed to adhere to good working practices and dust mitigation measures to ensure that the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance. There will be no significant impact from dust once the development is completed. Overall, it is envisaged that the proposed development will not have a significant impact on air quality. This is dealt with in Chapter 7.

16.2.1.2 Population and Human Health (Ch 3) - Noise/Vibration (Ch 9)

The greatest potential for noise and vibration impact arising from the proposed development will be in the construction phase. However, following the implementation of the proposed mitigation measures in relation to noise, the impact associated with the construction phase of the proposed development is predicted to be moderate, transient and temporary. No significant impacts on the local noise and vibration climate are predicted during the operational phase of the proposed development. This is dealt with in Chapter 8.

16.2.1.3 Population and Human Health (Ch 3) - Material Assets – Utilities (Ch 13)

The operational stage increased population will create greater demand on built services, placing greater demand on water requirements and the public sewer. Irish Water have confirmed capacity. This is dealt with in Chapter 13.

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

16.2.2 CHAPTER 4 BIODIVERSITY (CH 4)

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation, there are expected to be no residual negative effects to biodiversity which can be considered to be significant.

The key environmental interactions with biodiversity are with water and landscaping. A series of mitigation measures are set out in the Water Chapter of the EIAR which will ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard. With these

mitigation measures in place, interaction between Biodiversity and water is considered to be neutral, and the interaction between biodiversity and landscaping is considered to be neutral.

16.2.2.1 Biodiversity (Ch 4) – Land and Soils (Ch 5)

The biodiversity elements of this report have involved consultation with a wide section of the Project Team particularly in relation to the Construction Management, design, drainage and landscape elements of the proposed development. There are numerous inter-related environmental topics described in detail throughout this report document which are of relevance to the biodiversity chapter. The biodiversity chapter of the report involves interactions with the Land, Soils and Ground Water, Hydrology (Surface Water and Waste Water), Air and Climate, Noise and Vibration, Traffic and Transportation, Material Assets-Waste and Material Assets-Services. It is considered that there is the potential for slight, temporary negative impacts on biodiversity due to dust (air), noise, emissions to water and construction traffic associated with the Construction Phase of the proposed Project. These impacts are addressed in the relevant chapters of this EIAR.

16.2.2.2 Land and Soils (Ch 5) – Biodiversity (Ch 4)

The proposed development may have temporary negative impacts on biodiversity at site level during construction due to excavation and removal of soil with resultant impact on local biodiversity. It will not impose any significant impact on European Designated sites.

Excavation and soil works (i.e. through site clearance, re-profiling etc.) during the construction stage have the potential to cause impact on the biodiversity of the site, for example through disturbance of the available habitats, dust and noise. Mitigation has been incorporated to reduce impacts. This is dealt with in Chapter 5.

There are interactions between land and soils and water, with some surface water conveyed and stored in SuDS features such as soakaways and discharging to the ground where possible, replicating the existing greenfield site drainage as closely as possible. The likely impact will be permanent, slight and neutral. This is dealt with in Chapter 6.

The potential significant impacts on land and soils arising from these interactions in the construction and operational phases have been considered within the relevant discipline (biodiversity and soils/water) and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

16.2.3 LAND AND SOILS (CH 5)

16.2.3.1 Land and Soils (Ch 5) – Hydrology (Ch 6)

During construction of the proposed development, there will be soil excavation that could impact surface water quality if not adequately mitigated.

16.2.3.2 Land and Soils (Ch 5) – Air Quality (Ch 7)

Excavation works and exposure of soil during the construction phase can influence the microclimate in an area. The construction phase may result in the spread of dust onto surrounding land uses and public roads. The air quality assessment indicates that there is no significant impact associated with these matters. The implementation of the dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust. This is dealt with in Chapter 7.

The potential significant impacts on land and soils arising from these interactions with air quality/climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

16.2.3.3 Land and Soils (Ch 5) – Traffic and Transportation (CH 11)

Local Traffic and transportation will be implemented by the additional vehicle movements generated by the volume of excavated soil that will have to be transported off site, resulting in an increase of heavy good vehicles (HGVs) during construction. The increase in vehicle movements as a result of excavated soil removal during the construction phase will be temporary in duration. Traffic-related impacts during the construction and operational phases are addressed in Chapter 11 of this EIAR (Traffic & Transportation).

16.2.3.4 Land and Soils (Ch 5) – Material Assets – Utilities (Ch 13)

There are interactions between lands and soils and material assets, with the construction of drainage and utilities impacting the soil and subsoil as these materials will be removed to facilitate construction. The likely impact will be permanent slight, and negative.

There are interactions between lands and soils and material assets, with the delivery of stone fill under buildings and roads and footpaths resulting in additional construction vehicles on roads adjacent to the site. The likely impact will be negative, temporary and slight.

16.2.4 WATER, SURFACE WATER / GROUNDWATER (CHAPTER 6) & HUMAN HEALTH (CHAPTER 3)

Risks to human health include the accidental spills/ leaks of hydrocarbons/ oils entering the groundwater/surface water or potable water system. This impact following mitigation measures outlined in section 6.6 will result in an imperceptible impact to human health.

16.2.5 AIR QUALITY (CH7)

16.2.5.1 Air Quality (Ch 7) - Population and Human Health (Ch 3)

The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the demolition, construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term, negative and imperceptible with respect to the construction phase and long-term, neutral and imperceptible with respect to the operational phase.

With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. No other significant interactions with air quality have been identified.

16.2.6 NOISE/VIBRATION (CHAPTER 8) & MATERIAL ASSETS – TRAFFIC (CH 11)

In compiling this environmental impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to construction activities provided by the engineers. Noise emission sources from the proposed development during the construction and operational phases will be from construction plant and activity,

building services and traffic accessing the development. The noise impact assessment has been prepared in consultation with the design team and traffic engineers. Reference can be made to the relevant chapters for additional information.

16.2.7 LANDSCAPE AND VISUAL (CH 10)

The assessment of the landscape impacts associated with the proposed development has a number of interactions with other parameters of the assessment. In summary, these are as follows:

- Population and Human Health
- Biodiversity

The interactions of landscape with these parameters were as follows:

16.2.7.1 Landscape and Visual (Ch 10) & Population and Human Health (Ch 3)

The landscape and visual impact associated with human beings focuses on the effects to dwellings. The proposed development generates visual effects; the effects and associated amelioration of these effects is discussed in the impact section of the chapter. The proposed development would deliver key elements of a high quality new residential neighbourhood well served by public and communal open space and with good access to schools, retail, employment and other land uses and amenities provided by the self-sustaining town of Balbriggan. The related change to the landscape character, i.e. the planned expansion of the urban area to the settlement boundary, would have significant positive population and human health benefits (by providing homes offering a high level of residential amenities).

16.2.7.2 Landscape and Visual (Ch 109) & Biodiversity (Ch 4)

As detailed in Chapter 10, the proposed development retains key landscape elements/features including the Clonard Brook and associated vegetation, several hedgerows internal to the site, and several mature trees. As well as being of landscape and visual amenity value, these are important habitats, and their retention and protection, along with extensive new planting throughout the new neighbourhood, would have biodiversity benefits

16.2.8 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION (CHAPTER 10) & RISK MANAGEMENT (CH 15)

The analysis contained within this chapter interacts with the climate, local air quality, and noise impact assessments contained within this EIAR, in addition to the population and human health chapter. This is primarily due to the potential for an increase in traffic movements on the surrounding road network due to development.

16.2.8.1 Accidents & Disasters

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. Measures will be put in place to assess the risk of road traffic accidents during the construction phase. Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used and no unusual substance or underground tunnelling works required or predicted.

During the operational phase, it is anticipated that the risk of accidents will be influenced by the additional traffic generated by the proposed development. The potential likelihood of any incidents and the severity of such incidents is minimised due to the appropriate segregation of vulnerable road users through the development as a result of the new dedicated infrastructure proposals the design of which advocates self-

regulating low speed streets through the implementation of horizontal and vertical deflection and dedicated pedestrian / cycle linkages.

16.2.9 MATERIAL ASSETS – WASTE MANAGEMENT (CHAPTER 13)

16.2.9.1 Material Assets – Waste Management (Ch 13) & Land and Soils

During the construction phase, excavated topsoil and subsoil (c. 25,939.14, m^3) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that 12,740.42m^3 will be reused on site, while the remaining material (13,198.72m^3) will be removed offsite. When material is deemed unsuitable or is not required it will be taken off-site, for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5, Chapter 13 and the requirements of the RWMP (Appendix E 13.1 Volume III of the EIAR), will ensure the effect is **long-term, imperceptible** and **neutral.**

16.2.9.2 Material Assets – Waste Management (Ch 13) & Water, Hydrogeology & Hydrology (Ch 6)

Should waste be incorrectly handled or stored at the development site during construction works, it has the potential to cause an adverse impact upon water quality in the area through leaching of materials to groundwater or surface water. However, as mentioned above, waste will be segregated and stored in suitably contained waste receptacles at the site compound, considerably reducing the potential risk of pollution to water. It is not considered that there would be any significant risk to water quality as a result of waste management during the operational phase, given that waste will be collected by private, licensed waste contractors and recovered, recycled or disposed of at appropriately licenced waste facilities, which would have environmental controls in place as standard. This is dealt with in Chapter 11.

Should waste be incorrectly handled or stored at the development site, it has the potential to cause an adverse impact upon human beings through nuisance, including visual, odour and pests, and pollution to soils and water.

During the operational phase, suitably contained wheelie bins / waste receptacles will be provided to the residential area and childcare facility by private waste contractors, thus there would be no significant risk of pollution to soils. Waste will be collected on a regular basis. Therefore, waste would not be envisaged to accumulate to high enough volumes to cause nuisance. This is dealt with in Chapter 11.

16.2.9.3 Material Assets – Waste Management (Ch 13) & Material Assets – Traffic

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be **temporary** in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be **imperceptible** in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 11 (Material Assets - Traffic). Provided the mitigation measures detailed in Chapter 11, Chapter 13 and the requirements of the OWMP (included as **Appendix E 13.2 Volume III of the EIAR**) are adhered to, the predicted effects are **short to long-term**, **imperceptible** and **neutral.**

16.2.9.4 Material Assets – Waste Management (Ch 13) & Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and OWMP (**Appendices E 13.1** and **13.2**, respectively Volume III of the EIAR), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects predicted are **long-term, imperceptible** and **neutral**.

16.2.10 MATERIAL ASSETS – UTILITIES (CHAPTER 12) & LAND AND SOILS (CH 5)

The potential significant impacts on Material Assets – Utilities arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

There are interactions between utilities and lands and soils, with the construction of drainage and utilities impacting the quantity of soil and subsoil as these materials will be removed to facilitate construction. The likely impact will be permanent slight, permanent, and negative.

16.2.11 RISK MANAGEMENT (CHAPTER 15)

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

The potential significant impacts on risk management arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

16.2.12 CULTURAL HERITAGE (CHAPTER 13)

Due to the fact that there can often be a cross-over between archaeological, architectural, and cultural heritage sites, this chapter has been fully reviewed and cross-referenced where applicable.

There are interactions between this chapter and the landscape and visual chapter in view of the visual impacts on the settings of archaeological and cultural heritage sites and the potential for landscaping to mitigate such impacts

There are interactions between Cultural Heritage - Architectural heritage and the archaeology chapter in view of the nature of the tower house, which is built heritage, but of archaeological significance.

16.2.13 CULTURAL HERITAGE (CHAPTER 13 AND CHAPTER 14) & LANDSCAPE AND VISUAL (CHAPTER 9)

There are interactions between this chapter and the landscape and visual chapter in view of the visual impacts on the settings of structures of architectural heritage significance and the potential for landscaping to mitigate such impacts.

16.2.14 INTERACTIONS & CUMULATIVE IMPACTS

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other relevant existing and/or approved projects in the area.

The potential cumulative impacts primarily relate to traffic, dust, noise, and other nuisances from the construction of the development, with other planned or existing projects, and each of the EIAR chapters has regard to these in the assessment and mitigation measures proposed.

The potential cumulative significant effects through interactions have been considered and there is no significant potential for cumulative significant effects to arise from multiple non-significant effects. In respect of the project.

17.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

17.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration, and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring, or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal, and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

17.2 MITIGATION STRATEGIES

17.2.1 INTRODUCTION

There are three established strategies for impact mitigation - avoidance, reduction, and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

17.2.2 MITIGATION BY AVOIDANCE

Avoidance is generally the fastest, most cost effective, and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

17.2.3 MITIGATION BY REDUCTION

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

17.2.4 REDUCING THE EFFECT

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

17.2.5 REDUCING EXPOSURE TO THE IMPACT

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

17.2.6 MITIGATION BY REMEDY

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

17.2.7 MITIGATION AND MONITORING MEASURES

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

17.3 PROJECT DESCRIPTION & ALTERNATIVES EXAMINED

17.3.1 CONSTRUCTION MANAGEMENT STRATEGY

17.3.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

The Contractor's CEMP will implement the measures contained in this EIAR and the CEMP (included with the application in Appendix D Volume III of this EIAR). The CEMP presents the approach and application of environmental management and mitigation for the construction phase of the proposed Project. It aims to ensure that adverse effects from the construction phase of the proposed Project, on the environment are avoided or minimised. It broadly replicates the construction stage mitigation included in Chapters 3-14 of this EIAR and as summarised in Chapter 16.

Post planning, the appointed contractor will take ownership of the Construction Environmental Management Plan (CEMP). Prior to any demolition, excavation or construction, the Construction Environmental Management Plan (CEMP) will be updated by the successful contractor. The CEMP will set out the Contractor's overall management and administration of the construction project. The CEMP will be treated as a live document and communicated to all relevant personnel on site.

The Contractor's CEMP will:

- Be maintained and the procedures implemented by the contractor for the duration of the construction period.
- Manage all polluting activities likely to occur on site and include emergency response plans for environmental incidents e.g. hydrocarbon spillages.
- Detail measures to be carried out to avoid environmental incidents,
- Detail reporting procedures to be followed if incidents occur including details of responsible person in the construction team.
- Include details of training for all site personnel in the implementation of these procedures as part of the site induction process.
- Dangerous substances, such as oils, fuels etc., will be stored in a bunded zone. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental

Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

In addition to the EIAR mitigation measures already included in the CEMP (and mitigation contained in this EIAR and the NIS), the Contractor will be required to include additional details under the following headings:

- Working hours and days;
- Emergency planning - in the event of a fire, chemical spillage, cement spillage, collapse of structures or failure of equipment or road traffic incident within an area of traffic management. The plan must include contact names and telephone numbers for Local Authority (all sections/departments); Ambulance; Gardaí and Fire Services;
- Details of chemical/fuel storage areas (including location and bunding to contain runoff of spillages and leakages);
- Details of construction plant storage, temporary offices and site security arrangements, measures will need to be identified in relation to security of the various sites during construction e.g. controlled access onto site, measures to secure rear gardens, access, etc;
- Truck wheel wash details (including measures to reduce and treat runoff);
- Dust management to prevent nuisance (demolition and construction);
- Site run-off management;
- Noise and vibration management to prevent nuisance (demolition and construction), Work practices, equipment noise control and screening shall be in compliance with BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (together referred to as B.S. 5228);
- Landscape management;

Construction of the development involves the following principal elements:

6. Site strip. Earthworks associated with the construction of the houses and roads in the development.
7. Construction of new buildings - houses, duplex units & creche.
8. Construction of roads, footpaths & hard/soft landscaping.
9. Buried site services installation. New foul pumping station. Connection to public services.
10. Works to the Cookstown Road along the site boundary, and a new footpath along the southside of the road as far as the existing school crossing.

17.3.3 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

In general, the impact of the construction period will be short-term in nature and less significant than the operational stage of the proposed development due to the reduced traffic volumes generated during the construction stage compared to the operational stage. In addition, the peak construction arrivals / departures will be outside of the road network peak hours and therefore will not exacerbate any existing delays encountered during peak times. It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day, and such will not impact significantly during the peak traffic period.

Legislation and guidelines relevant to maintaining the safety of the public adjacent to construction works includes:

- Safety, Health & Welfare at Work (Construction) Regulations 2013
- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2009), Department for Transport/Highways Agency
- Traffic Management Guidelines (2019), Department of Transport

17.3.3.1 Site Access Routes

Transporting materials to and from site could potentially create nuisance to road users and residents living adjacent to haul roads. To minimise this risk, it is important that the location of site access points for use by construction vehicles is agreed with the Local Authority. It is proposed that local access to the site will generally be provided from the existing roundabout on the LDR 6.

The condition and width of all access roads shall be assessed by the Contactor to ensure that they are suitable for use by heavy construction traffic and delivery of over-sized loads.

17.3.3.2 Construction Traffic

Routing In general, materials will be delivered to site using the public road network. Local access points will be required to enter the construction site from the LDR 6. These access points may require local traffic management.

17.3.3.3 Construction Parking

Parking for construction operatives will be provided within the construction compound. Traffic Management Plan the Contractor shall establish a Traffic Management Plan for the construction works.

The applicant will seek to avoid, wherever possible, bringing construction traffic through areas where there are existing residents. Phases 3 and 4 could have an impact on newly occupied residences constructed in earlier phases.

Old Athlumney Road will not be used as a haul route during construction and will be used only in relation to works along the Old Athlumney Road which include the culverting of the existing open water channel and provision of footway etc.

The TMP shall:

- Address the movement of vehicles, machinery, and pedestrians within the site boundary and on adjacent public roads & footpaths
- Ensure that the safety of construction operatives, public road users and pedestrians is not compromised as a consequence of the works.

This shall be achieved through the effective implementation of traffic mitigation measures. When considering mitigation measures, the Contractor shall pay particular attention to sensitive and vulnerable users (e.g. children, elderly etc) and take account of stakeholders whose activities may be affected by the proposed works (e.g. local schools, residents, businesses etc)

All construction related parking will be provided on site. Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff anticipated to be 40 no. staff car trips daily. The proposed on-site car parking area will be designed to have the capacity to accommodate this parking demand in addition to an element of visitor parking spaces.
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

It is anticipated that the generation of HGV’s during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 18:00 and avoid the PM peak hour.

To minimise disruption to the surrounding environment, the following mitigation measures will be implemented:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided during all construction phases. This will be via the existing accesses constructed on the LRD6.
- Provision of sufficient on-site parking for staff and visitors (as described above) and compounding through the construction of temporary hardstanding areas to ensure no potential overflow of construction generated traffic onto the local network.
- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- A dedicated construction haul route has been identified and will be agreed with the local authority prior to the commencement of constructions activities on-site.
- Truck wheel washes will be installed at construction and discharge from wheel wash area will be directed to on-site settlement ponds.
- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works.
- Measures will be put in place to minimise the risk of road traffic accidents during the construction phase including;
    - appropriate temporary traffic management as required,
    - strict adherence to the proposed construction vehicle haul route, and
    - Wayfinding signage so all visitors can navigate to the designated visitor parking and sign in areas.

17.3.4 LIAISON WITH NEIGHBOURING PROPERTIES

A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust and groundwater monitoring regime put in place for the duration of the works.

The Contractor will appoint a competent person to be referred to as the Surveying, Instrumentation and Monitoring Subcontractor (MSC) who will implement the monitoring measures during the construction phase described in this EIAR.

The MSC will be responsible for preparing or organising the preparation of condition surveys of surrounding buildings, walls, hardstanding area etc. prior to the carrying out of any works on site. Extent of surveys to be agreed. The condition surveys will be carried out to a level of detail, suitable to the nature

and extent of conditions encountered in order to obtain an understanding of the general structural condition of the property/structure and/or external environments.

It is proposed that vibration monitoring will be conducted at properties adjacent to or within 50m of the site as required using calibrated vibration monitors and geophones capable of transmitting live text and email alerts to ensure that if vibration levels approach or exceed specified warning and limit values.

17.3.4.1 Traffic Management & Construction Access

In general, the impact of the construction period will be temporary in nature and less significant than the operational stage of the proposed development (HGV vehicle movements not expected to exceed 4 vehicles per hour during the busiest period of construction works).

The works associated with the new development will result in additional traffic on the road network with the vehicles for the importation of earthworks fill material and the delivery of new materials for construction – concrete, concrete blocks, pipes, timber, roof tiles, glazing, road surfacing materials etc. Construction traffic access to the site will be via the LDR6 (with some minor construction traffic related to the construction of the residential cell at the Old Road. It is proposed that unloading bays should be provided for deliveries to the site within the hoarding perimeter. Appropriately demarcated storage zones will be used to separate and segregate materials. All deliveries to site will be scheduled to ensure their timely arrival and avoid the need for storing large quantities of materials on site. The storage area is to be located at least 50m from the site access to allow for the possibility of traffic queueing inside the site without any interference with the public road.

The mitigation will include the following matters:

- The contractor shall be responsible for and make good any damage to existing roads or footpaths caused by his own contractor's or suppliers transport to and from the site.
- The contractor shall at all times keep all public and private roads, footpaths entirely free of excavated materials, debris, rubbish, provide vehicle wheel wash and thoroughly clean all wheels and arches of all vehicles as they leave the site.
- The contractor shall confine his activities to the area of the site occupied by the works and the builders' compound, as far as practicably possible, during any particular phase of the development.
- Properly designed and designated entrance and egress points to the construction site for construction traffic will be used to minimize impact on external traffic.
- Flagmen shall be used to control the exit of construction vehicles from the site onto the public road, if required.
- Existing fire hydrants are to remain accessible as required.

Construction vehicle movements will be minimised through the implementation of the following measures contained in the CEMP, which forms part of the mitigation in this EIAR (See Appendix D Volume III of this EIAR):

- Consolidation of delivery loads to/from the site and scheduling of large deliveries to site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- 'Cut' material generated by the construction works will be re-used on site where possible, through various accommodation works.
- Adequate storage space on site will be provided;
- Construction staff vehicle movements will also be minimised by promoting the use of public transport.
- Car sharing among the construction staff following Covid-19 safety guidelines may be used to reduce traffic numbers. Public Transport: An information leaflet to all staff as part of their induction

on site highlighting the location of the public transport services in the vicinity of the construction site.

17.3.5 REINSTATEMENT / ROAD CLEANING

Prior to the works commencing, detailed photographic surveys (condition schedules) of adjoining walls, roads, footpaths, fences etc. is to be prepared. Copies of the relevant parts are to be made available to adjoining owners and FCC. This record will form the basis of assessing repairs to adjoining areas in the future should a dispute arise as to their cause. Roadways are to be kept clean of muck and other debris. A road sweeping truck is to be provided as necessary, to ensure that this is so.

Reinstatement at completion of the works will involve:

- Testing and cleaning of all watermains in the development to the requirements of the IW / FCC prior to connection to the public watermain. This will reduce the risk of contamination to the public water supply when the new network is connected to the system.
- Repair of any damage to any adjacent public roadways, kerbs, grass verges etc. in accordance with FCC requirements.
- Reinstatement of all excavations to the requirements of FCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

17.4 POPULATION AND HUMAN HEALTH

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

17.4.1 CONSTRUCTION PHASE

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 16 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIAR.

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Environment Management Plan will be submitted by the contractor and implemented during the construction phase. The content of the CEMP will be based on the mitigation set out in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Resource and Waste Management Plan and Operational Waste Management Plan, both prepared by AWN Consulting (and also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

17.4.2 OPERATIONAL PHASE

The operational phase will enable the delivery of much needed additional residential accommodation across the surrounding lands. The addition of new roads and trunk infrastructure to the area will also improve the available vehicular and pedestrian access in the area through the creation of new linkages between the existing road network and the establishment of new pedestrian pathways and cycle lanes which help to support and encourage the usage of more active travel modes through the area, which will also have significant social benefits to future communities in the area through the appropriate provision of high-quality public transport connections.

During the operational phase of the development the design of the entire scheme has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

For the operational phase, no further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR.

17.4.3 MONITORING

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR with regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

17.5 BIODIVERSITY

This report has identified four impacts that were assessed as '*significant'*. Mitigation is therefore recommended to reduce the severity of these effects.

17.5.1 CONSTRUCTION PHASE

BIO CONST 1: Loss of high value hedgerow habitat – mitigation by offset.

Habitat loss will be offset by new planting proposed in the landscaping scheme. This is shown in figure 4.4. According to the landscape report:

"there will be a net gain for bio-diversity by planting native tree species, coupled with plants selected form a list of pollinator friendly species and maintained to increase the availability of flowering plants in the shoulder months."

New planting includes c.125m of new native hedgerow along the Clonard Road as well as new trees throughout. Species to be planted have been chosen for their biodiversity benefit including native and non-native trees and those which are pollinator friendly.

The Riparian Corridor is seen as providing foraging opportunities for the three species of bat who were identified as feeding on the site. No bats were found to be roosting on the site. However, it is considered advisable to provide roosting opportunities on site and install '6x 2F Schwegler bat boxes in unlit areas at least 2.5m above ground with no surrounding branches or brambles.

Figure 17.1: Landscaping proposal

BIO CONST 2: Mortality to animals during construction – mitigation by avoidance

The following is recommended for the bat report:

“All trees with roost potential shall be checked by a bat specialist prior to felling or surgery. The roost potential shall be determined by a bat specialist prior to tree felling.

All trees with roost potential shall be felled between September and November to ensure that bats are not breeding or hibernating within trees and to ensure that nesting birds are unaffected (March 1st to August 31st).”

Planting of vegetation
Where there is an opportunity to provide vegetative cover, some native and local plant species should be employed such as dog rose with an encouragement of species such as Clematis, Hebe, night-scented stock, Nicotiana and other species attractive to moths. The retention of mature oak is recommended including surgery in preference to felling wherever feasible.

The retention of as much of the existing beech as possible is recommended including surgery in preference to felling wherever feasible.

Bat boxes
While no bat roosts were identified from this out of season survey trees within the site offer good roost potential and there may be roost loss. 6 x 2F Schwegler bat boxes or equivalent are proposed for installation (in unlit areas at least 2.5 metres above ground level with no surrounding clutter – branches, bramble etc.). Where there are no suitable locations for bat boxes on trees or other structures, equivalent bat boxes (i.e. 4 x 2FR boxes) shall be incorporated into buildings.

BIO CONST 3: Pollution during construction – mitigation by reduction

A Construction Method Statement has been prepared, and which includes pollution prevention measured in accordance with best practice guidelines from Inland Fisheries Ireland (2016). This will include the erection of a robust silt curtain (or similar barrier) along open drainage ditches to prevent the ingress of silt to the Bremore Stream. Water leaving the site will pass through an appropriately sized silt trap or settlement pond so that only silt-free run-off will leave the site.

A silt curtain or similar barrier will be erected along the drainages ditch leading to the Bremore Stream and will remain in place for the duration of works.

Dangerous substances, such as oils, fuels etc., will be stored in a bunded zone. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same.

- **Headwall and Surface Water Sewer Construction**

It is proposed to install of pre-cast headwalls leading to the drainage ditch as part of the surface water drainage system at the site. All in-stream works will be carried out in accordance with an approved method statement.

Prior to construction of the headwall, a constraints zone will be identified and implemented at the construction area adjacent to the ditch/stream. This area will ensure the avoidance of physical damage to the ditch/stream, to ensure all work will be carried out in the dry and effectively isolated from the surface water network, and to ensure that no suspended sediment and associated nutrients are released into surface waters from excavation and earthworks. Where works are required that extend to the full width of the ditch, a culvert for example, these works also need to be undertaken entirely in the dry. The location will be dammed at both ends so that no scouring of silt or sediment will take place.

No in-stream bed material is to be removed and no in-stream works are to be undertaken.

- **General Water Protection Measures (taken from the Construction Environmental Management Plan prepared by Paul McGrail Construction Engineers – contained in Appendix D Volume III of the EIAR)**

Works will follow best practice guidance as outlined in Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), CIRIA 2010 Environmental Good Practice on Site & CIRIA 2001 Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors. Although the risk of any significant impact on water quality in any receiving water bodies is considered to be extremely low given the lack of running water features on the site. Best practice will be implemented at all times in relation to all construction activities to avoid any accidental pollution events occurring to the wet ditches in the area or polluting the ground water table.

This will include the following actions:

• SuDS will be constructed in line with manufacturer's guidelines / best practice methods.
• At this development consist attenuation system stormtech underground to cater for the 100-year return period and a detention basin to cater for the 1-100 year were designed for this site. The design of the attenuation is in accordance with CIRIA SuDS Manual C753 2015. Please refer to the accompanying drawings for further information.
• During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
• Water contaminated with silt will not be allowed to enter a watercourse or drain as it can cause pollution. All parts of the drainage system will be protected from construction runoff to prevent silt clogging the system and causing pollution downstream. Measures to prevent this include, early construction of sediment management basins, channelling run-off away from watercourses and surface water drains and erosion prevention measures.

Following construction, subsoil that has been compacted during construction should be broken up prior to the re-application of topsoil to reinstate the natural infiltration performance of the ground.

• Pipe systems and orifices will be checked for blockages or partial blockages.
• Silt deposited during construction will be removed.
• Soils will be stabilised and protected from erosion whilst planting becomes established.

Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas.

Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential pollutants being discharged from the site.
• Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
• Pouring of cement-based materials for works will only be carried out in dry conditions.
Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network.

Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

• Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.
• A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar with the emergency procedures and use of the equipment.

17.5.2 OPERATIONAL PHASE

BIOCONST 4: Impacts from lighting – mitigation by reduction

The following is recommended:

Lighting should be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. This may be achieved through cowls and appropriately directed lighting. No lighting should exceed 3 lux along the treetops of the bordering remaining trees (and those trees to be planted when mature).

The lighting proposed has been examined and has taken these recommendations into account.

The lighting detail can be seen in the ENX Consulting letter which confirms that *"the public lighting has been designed to a lighting class of P4 (EN13201), with a step back to Lighting class P5 after 12 O'Clock Midnight.*

We can further confirm we have designed the public lighting for the scheme in accordance with Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018). A lighting accessory in the form of cowls may be installed where necessary as a preventative measure to reduce unwanted light spill. The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt to ensure limited unwanted light spill. Lamps shall have a narrow spectrum and limited UV component."

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

17.5.3 CONSTRUCTION PHASE

The mitigation measures are considered to be standard measures and come with a high level of confidence with regard to their success. Further monitoring is not required.

17.6 LAND AND SOILS

This section outlines the measures that will be employed in order to minimise the impact on land, soils, and groundwater of the proposed development.

17.6.1 CONSTRUCTION PHASE

A Construction Environmental Management Plan (CEMP) (2024) is included with the application documentation and contained in Appendix D Volume III of this EIAR. This outlines the best practice construction techniques and methodologies which will be implemented during construction of the proposed development.

The CEMP and the mitigation measures contained in this EIAR, as well as any relevant conditions of a grant of permission, will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect soil and water quality. All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

17.6.1.1 Soil Management

The strategy for controlling and mitigating potential adverse environmental issues related to soil and contamination during construction will include the following, as appropriate:

- Identification and assessment of the potential for residual ground contamination to be presented prior to the start of any excavation works.
- Minimisation of potential risks to site workers as required by the Safety, Health and Welfare (Construction Regulations) 2013.

- Testing and sampling of excavated soils in order to assess the suitability of materials for re-use on site.
- Dust suppression from any contaminated soils by the regular use of water spray during any dry conditions, sheeting of haulage vehicle loads.
- Stockpiling of contaminated materials will be avoided where possible.
- Stockpiles will be treated to prevent windblown dust.
- The handling and storage of any potentially hazardous liquids on site, e.g. fuels and chemicals, will be controlled and best practice guidelines. Storage tanks/container facilities will have appropriate bunding within the designated area.
- If hazardous liquids escape, remedial action will be taken as soon as possible.
- Where unforeseen contamination is identified during the course of the work, specific investigations will be carried out in the areas in question and appropriate health and safety procedures will be implemented during the removal of the material. A strategy will be prepared to identify, analyse, segregate and control existing contaminated materials on site. In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

17.6.1.2 Run Off Suspended Solids

- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
- Silt deposited during construction will be removed.
- Soils will be stabilised and protected from erosion whilst planting becomes established.
- Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas. Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential pollutants being discharged from the site.
- Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
- Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar with the emergency procedures and use of the equipment.
- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts;
- Silt reduction measures on site and settlement measures (e.g. silt traps and settlement tanks/ponds or equivalent);
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m;
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection;

- Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points;
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination;
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust;
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations;
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.

17.6.1.3 Sources of Fill and Aggregates

- All fill and aggregate for the proposed development will be sourced from reputable suppliers per the project Contract and Procurement Procedures. All suppliers will be vetted for:
- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

17.6.1.4 Cement /concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Irish Water / FCC.

Pouring of cement-based materials for works will only be carried out in dry conditions. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network. Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

17.6.1.5 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase to prevent any spillages to ground of fuels and other construction chemicals and prevent any spillages resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowsers are used, the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers to carry a spill kit and operatives must have spill response training;
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors*" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

17.6.2 OPERATIONAL PHASE

The proposed development design includes hardstand cover across the site and the proposed surface water drainage system for this development has been designed as a sustainable urban drainage system. The surface water design has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers for adoption. The drainage network will consist in 1 catchment attenuating to the green-field runoff at the last hydrobrake from the site on the combined detention basin system and discharging the attenuated flow at the existing stream (Clonard Brook Stream) located at the southern part of the site. Any localised car leaks will therefore discharge to the stormwater drainage and be treated in oil interceptors. Therefore, the risk of accidental discharge has been adequately addressed through design.

17.6.3 MONITORING OR REINSTATEMENT

The management of land, soils and ground water during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant waste management legislation and local authority requirements.

17.6.3.1 Construction Phase

During construction phase the following monitoring measures will be implemented:

- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and
- Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc). Pouring of cement-based materials for works will only be carried out in dry conditions.

17.6.3.2 Operational Phase

There will be no requirement for groundwater monitoring as there is no likely discharge to ground.

17.7 WATER, HYDROLOGY, HYDROGEOLOGY

The design has taken account of the potential impacts of the development on the hydrological environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding water bodies.

17.7.1 CONSTRUCTION PHASE

A Construction Environmental Management Plan (CEMP) (2024) is included with the application documentation and contained in Appendix D, Volume III of this EIAR. This outlines the best practice construction techniques and methodologies which will be implemented during construction of the proposed development including measures to protect waters bodies. The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the CEMP and this EIAR will be employed on site during the construction phase.

The CEMP and mitigation measures set out in this EIAR will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures.

All mitigation measures outlined in this chapter, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The CEMP and this EIAR contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts.

Construction works and the proposed mitigation measures are informed by best practice guidance on the prevention of pollution during development projects including but not limited to:

- Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016);
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741); and
- Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005).

The CEMP provides actions and measures which will be undertaken for the purpose of environmental management and pollution prevention during the construction phase. As there is potential for run-off to indirectly discharge to a watercourse (Clonard Brook Stream, also known as the Bremore Stream) in the vicinity of the site and in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase:

- SuDS will be constructed in line with manufacturer's guidelines / best practice methods.
- This development includes an attenuation system stormtech underground to cater for the 100-year return period and a detention basin to cater for the 1-100 year were designed for this site. The design of the attenuation is in accordance with CIRIA SuDS Manual C753 2015. Please refer to the accompanying drawings for further information.

- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
- Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the Clonard Brook stream.
- Water contaminated with silt will not be allowed to enter a watercourse or drain as it can cause pollution. All parts of the drainage system will be protected from construction runoff to prevent silt clogging the system and causing pollution downstream. Silt reduction measures to prevent this include, early construction of sediment management basins, channelling runoff away from watercourses and surface water drains and erosion prevention measures. Following construction, subsoil that has been compacted during construction should be broken up prior to the re-application of topsoil to reinstate the natural infiltration performance of the ground.
- Pipe systems and orifices will be checked for blockages or partial blockages.
- Soils will be stabilised and protected from erosion whilst planting becomes established. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
- Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate,
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
- all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.
- Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.

17.7.1.1 Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

Pouring of cement-based materials for works will only be carried out in dry conditions. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network. Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Irish Water / FCC. The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

17.7.1.2 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowsers are used, the following measures will be taken:
- Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
- The pump or valve will be fitted with a lock and will be secured when not in use;
- All bowsers to carry a spill kit and operatives must have spill response training;
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
- In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:
- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment.
- The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

17.7.1.3 Rainwater Run-off

Rainfall at the construction site will be managed and controlled for the duration of the construction works until the permanently intercepted and attenuated surface water drainage system of the proposed site is complete. In the meantime, rainwater will continue to discharge to ground as current.

17.7.1.4 Wastewater Management

Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.

17.7.1.5 Surface Water Flow and Quantity

During construction a site drainage and protection system will be built to reduce the flow of run-off from the site, prevent soil erosion, and protect water quality in the Clonard Brook Stream and Bremore River. Temporary excavated channels, bunds, or ridges or a combination of the three, may be constructed to divert sediment-laden water to an appropriate sediment retention structure. These will be installed to provide permanent diversion of clean stormwater away from erosion exposed soil areas, or to provide a barrier between exposed areas and unexposed areas of the construction site. Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life.

17.7.1.6 Human Health and Population

It has been established (Section 6.3.3) that there are no recorded Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Clonard Brook stream or the Bremore River. On a precautionary basis, the mitigation measures set out above in Section 6.6 will be implemented during the construction works for the protection of human health and populations.

17.7.1.7 Potential Impacts on Water Framework Directive

It has been established (Section 6.5.2) that while, there is a potential of accidental discharges during the construction phase this will not impact on trends in water quality and overall WFD status assessment. On a precautionary basis, the mitigation measures previously set out in Section 6.6 above, will be implemented during the construction works for the protection of surface water status and achievement of the programme of measures.

17.7.2 OPERATIONAL PHASE

17.7.2.1 Surface Water Quality

The design has taken account of the potential impacts of the development on surface water quality; measures have been incorporated in the design to mitigate these potential impacts.

The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS). These measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the Clonard Brook stream, which subsequently outfalls to the nearby Bremore River. SuDS are drainage systems that are environmentally beneficial, causing minimal or no long-term detrimental damage. The SuDs design is set out in the Engineering Services Report (2024) and uses above-ground storage detention basins (interception system), bioretention systems, flow control devices (Hydrobrake), grass swales, modular permeable paving (porous surfacing), and petrol interceptors.

The purpose of the SuDs design is to:

- Treat runoff and remove pollutants to improve quality;
- Restrict outflow and to control quantity;
- Increase amenity value.

According to Fingal 2023-2029 Strategic Environmental Assessment (SEA), objective IUO26 states developments must '*ensure a minimum 10m wide riparian buffer strip measured from the top of the bank either side of all watercourses*', which applies to lands within development boundaries as per FCC. A riparian buffer along the Clonard stream will be established and landscaped. This will improve the flow and habitat characteristics of the stream both on and off site. The riparian zones will be fisheries compliant and will contain features for biodiversity enhancement.

The layout of the proposed surface water drainage network is shown on Paul McGrail Consulting Engineers Ltd (2024) Drawing Set included with this Application. It is proposed to strictly separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the surface water and wastewater sewer networks respectively.

17.7.2.2 Surface Water Flow and Quantity

The design has taken account of the potential impacts of the development on surface water flow, measures have been incorporated in the design to mitigate these potential impacts.

As set out in the Engineering Services Report (2024), flow restriction is achieved by means of a hydro-brake installed at the outfall of each surface water catchment within the development, with the excess storm water stored on site for the duration of the storm periods of up to 1 in 100 years. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water run-off associated with the 1-in-100-year event to the detention basins for attenuation without any overland flooding.

Surface water runoff exceeding the allowable outflow rate for the catchment will be stored in detention basins for rainfall events ups to a 1 in 100-year return period with an allowance for climate change of 20%. The proposed development includes a new surface water network which will mitigate any pluvial risk to the site in line with SuDS measures.

17.7.3 MONITORING OR REINSTATEMENT

The management of hydrology during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant water legislation and local authority requirements.

17.7.3.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- A riparian buffer zone applies along the stream boundary with Silt interception.
- Contractors will carry out regular inspections to confirm compliance with the CEMP. Daily inspections by contractors will address potential environmental impacts including dust, litter, waste management and general housekeeping.
- Regular inspection of surface water run-off and sediments controls (e.g., silt remediation treatment e.g. silt traps/fence or equivalent). Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire.
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated water run-off; and
- Regular inspection or auditing of construction / mitigation measures (e.g., concrete pouring, refuelling, etc).
- Silt Remediation treatment system.

17.7.3.2 Operational Phase

No future surface water monitoring is proposed for the proposed development due to the low hazard potential at the site.

Oil / hydrocarbon / petrol separators or interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions.

Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

17.8 AIR QUALITY

17.8.1 CONSTRUCTION PHASE MITIGATION

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 7.5.3). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

17.8.1.1 Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

17.8.1.2 Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
- Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary where feasible, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

17.8.1.3 Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

17.8.1.4 Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

17.8.1.5 Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

17.8.1.6 Waste Management

- No bonfires or burning of waste materials.

17.8.1.7 Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

17.8.1.8 Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

17.8.1.9 Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

17.8.1.10 Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days).

17.8.2 OPERATIONAL PHASE MITIGATION

There is no mitigation required for the operational phase of the development as effects on air quality are predicted to be ***direct, long-term, negative*** and ***not significant***.

17.8.3 MONITORING

17.8.4 CONSTRUCTION PHASE

During working hours, dust control methods will be monitored in addition to the prevailing meteorological conditions.

Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks (by visual inspection) of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days).

17.8.5 OPERATIONAL PHASE

There is no proposed monitoring during the operational phase.

17.9 CLIMATE

17.9.1 CONSTRUCTION PHASE MITIGATION

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Materials will be reused on site where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Material choices and quantities will be reviewed during detailed design, to identify and implement lower embodied carbon options where feasible;
- Sourcing materials locally where possible to reduce transport related CO_2 emissions; and
- The project shall review and determine compliance with the requirements set out in the EU Taxonomy Regulation (Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 (Text with EEA relevance) in relation to circular economy. This is specific to reuse, recycling and material recovery of demolition and construction wastes.

These measures are supported by Glenveagh Properties PLC's *Net Zero Transition Plan 2023*, published in March 2023, which identifies the sources of Glenveagh Properties PLC's emissions and proposes measures to reduce these. A commitment to achieve a 55% reduction in Scope 3 (construction methods) emissions intensity (tCO_2e per 100 m^2 of complete floor area) by 2031 (using 2021 as the baseline year) will involve supplier engagement to make informed procurement decisions, engaging with subcontractors to support their transition to less carbon intensive fuels (diesel and gas oil is currently the norm) and investing in innovation of designing and building homes to reduce their associated embodied carbon. A reduction target of 46.2% by 2031 is also set in the plan for Scope 1 and 2 emissions (company operations). All targets have been validated by the Science Based Targets initiative (SBTi).

The Science Based Targets initiative (SBTi) is a corporate climate action organisation, incorporated as a charity, which develops standards, tools and guidance enabling companies to set greenhouse gas (GHG) emissions reductions targets in line net-zero by 2050 at latest. Science-based targets show companies and financial institutions how much and how quickly they need to reduce their greenhouse gas (GHG) emissions to prevent the worst effects of climate change (SBTi, 2024a). Glenveagh Properties PLC was one of the over 4,000 companies and financial institutions who had their emission reduction targets

validated by the SBTi (Marshall Yards Development Company Limited which is a subsidiary of Glenveagh's target's can be searched in the SBTi's target dashboard (SBTi, 2024b)).

Glenveagh Properties PLC's *Full Year 2023 Results*, published in February 2024, identified that Scope 3 emissions decreased by 7% against the 2021 baseline, measured on an intensity basis (tCO_2e per $100m^2$). This is primarily due to the focus on the energy efficiency of the residential unit, with the proportion of A1 rated homes in 2023 increasing from 55% to 85%. Scope 1 and 2 emissions decreased by 11% compared to 2022, which can be attributed to the roll out of HVO (hydrotreated vegetable oil) to replace diesel across sites.

Specific measures are proposed to reduce GHG emissions during the construction phase:

- An estimated that approximately 25,939m^3 of material will be excavated during the construction phase of the development site. 12,740m^3 of this material can be reused, which represents greenhouse gas (GHG) savings of 24.6 tonnes if the avoidance of worst-case landfill disposal is assumed;
- Materials such as concrete, bricks, tiles and ceramics, metals and timber may be diverted from waste processing by recycling or disposal in landfill and can instead be reused on-site. This will reduce the associated CO_2 by approximately 0.5 tonnes; and
- Use of timber as a lower carbon option for frames for the house units.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

17.9.2 OPERATIONAL PHASE MITIGATION

As per the Climate Action Energy Statement prepared by ENX Consulting Engineers (submitted under separate cover with this planning application) the development will be a Nearly Zero Energy Building (NZEB) in accordance with the Building Regulations Technical Guidance Document L 2021 and the relevant sustainability policies within the Fingal Development Plan 2023-2028. The report details a number of measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- The residential units will aim to achieve a Building Energy Ratio (BER) of A2 (25-50 kwh/m2/yr with CO2 emissions <10 kg CO2/m2 per year).;
- Achieve air tightness standards of 3 $m^3/m^2/hr$;
- Ensure thermal bridging details are designed to achieve default thermal bridging factors of 0.15W/m^2K (0.15 W/m^2k required in Part L);
- Energy Performance Coefficient (EPC) < 0.30;
- Carbon Performance Coefficient (CPC) < 0.35;
- Renewable Energy Ratio (RER) > 0.20;
- Meet or exceed minimum U-Value standards identified in Part L 2022 Dwellings;
- Various options for heating of apartments are to be considered, including air to water heat pumps and exhaust air heat pumps and implemented to achieve A2 BER Rating;
- Provide an appropriate combination of technologies to ensure energy consumption is in line with Part L 2022 Dwellings requirements;

- All lighting to be energy efficient with provision made for low energy lamps such as Compact Fluorescent Lamps (CFLs) which use 80% less electricity and last up to 10 times longer than ordinary light bulbs in the dwellings;
- Use of natural daylight will be maximised to reduce the need for artificial lighting;
- Passive solar gains will be optimised to reduce space heating demands during the winter months, whilst limiting summertime solar gains to reduce space cooling demands;
- Natural/passive ventilation in circulation areas, car parks and other common areas removes need for mechanical ventilation;
- Bicycle parking spaces will be provided, and the connectivity of onsite pedestrian and cycle infrastructure has been incorporated into the design of the proposed development; and
- The proposed development location maximises connectivity to existing and proposed public transport bus services, as well as by its proximity to the green Luas line, providing sustainable alternative to private vehicles.

The above measures will assist in optimising the energy consumed by the development and will also have the benefit of reducing the impact to climate during the operational phase of the development.

Some measures have been incorporated into the design of the development to mitigate the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated to avoid potential flooding impacts due to increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate.

17.9.3 MONITORING

There is no proposed monitoring during the construction phase or during the operational phase.

17.10 NOISE AND VIBRATION

17.10.1 CONSTRUCTION PHASE MITIGATION

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.

BS5228 includes guidance on several aspects of construction site practices, including, but not limited to:

- Selection of quiet plant.
- Control of noise sources.
- Screening (boundary, and or localised plant screening).
- Hours of work.
- Liaison with the public.
- Monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring.

17.10.1.1 Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible.

17.10.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that “as far as reasonably practicable sources of significant noise should be enclosed”. In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators.

BS5228 makes a number of recommendations in relation to “*use and siting of equipment*”. These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site.

"Plant should always be used in accordance with manufacturers’ instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.
Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.

Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.

*Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.**

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material.”

Other forms of noise control at source relevant to the development works are set out below:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker ‘tool’ and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools/ breakers and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

17.10.1.3 Screening

Typically, screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as aggregate can provide a degree of noise screening if placed between the source and the receiver. The use of localised mobile (mobile hoarding screens and / or acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options should be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings.

17.10.1.4 Liaison with the Public

A designated noise liaison should be appointed to site during construction works. All noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, e.g. demolition, breaking, piling, etc., the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

17.10.1.5 Hours of Work

Construction works will be undertaken within the times below, taken from the Section 6 of the Draft Construction Management Plan:

- Monday to Friday: 07:00 to 19:00hrs
- Saturday: 07:00 to 14:00hrs
- Sunday and Public Holidays: No noisy work on site.

17.10.2 OPERATION PHASE MITIGATION

The British Standard BS EN 12354-3: 2000: Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

The principles outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades. This approach corrects the noise levels to account for the frequency content of the source

in question. In this instance, rail and road traffic noise, depending on the buildings in question. For properties with cumulative impacts from both rail and road, the frequency content of the dominant source has been used for calculations.

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. Table 9.18 and Table 9.19 provide the calculated specification for glazing and ventilation, respectively. Facades where the glazing and ventilation are required are presented in Figure 9.6.

Table 17.1: Sound Insulation Performance Requirements for Glazing, SRI (dB)

Facade	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
RED	24	25	32	41	38	46	36

Table 17.2: Sound Insulation Performance Requirements for Ventilation, SRI (dB)

Facade	Octave Band Centre Frequency (Hz)						$D_{ne,w}$
	125	250	500	1k	2k	4k	
RED	30	33	38	37	36	36	38

Figure 17.2: Façade Mitigation

The overall R_w and $D_{ne,w}$ outlined above are provided for information purposes only. The over-riding requirement is that the internal noise criteria is achieved, other combinations of upgraded glazing and ventilation may provide the same or better performance than those outlined within this report.

In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB Rw for this construction.

Internal Noise Levels

Taking into account the external façade levels and the specified acoustic performance to the building envelope, the internal noise levels have been calculated. For all buildings within the development site, the good internal noise levels are achieved with windows closed.

17.11 LANDSCAPE AND VISUAL

17.11.1 CONSTRUCTION PHASE

The negative landscape and visual impacts of construction are an unavoidable consequence of development and there is limited potential for mitigation. Site hoarding would screen ground level activity, (low) stockpiles, vehicles, etc. but once the buildings grow above ground floor level, they would be visible above the hoarding, as would cranes, scaffolding and construction activity on the buildings themselves. No landscape or visual-specific mitigation is recommended other than standard best practice construction site management, which should include the erection and maintenance of hoarding on the site boundaries.

The above assumes that the tree protection measures recommended in the *Arboricultural Report* (June 2024) by Charles McCorkell Arboricultural Consultancy will be fully implemented. The retention of certain trees and hedgerows on the site is an important part of the proposed development, and any loss of these features would constitute a negative landscape impact. The McCorkell report states: *"All retained trees and hedgerows can be successfully protected during the proposed development works by using robust fencing measures which comply with the recommendations outlined within BS 5837:2012"*. Section 2: Arboricultural Method Statement of the McCorkell report sets out the method by which the trees and hedgerows would be protected during construction.

17.11.2 OPERATION PHASE

The potential landscape effects of the proposed development have been classified 'moderate positive' (based on an analysis of the proposal against the relevant criteria in the *Urban Design Manual – A Best Practice Guide (2009)*). The urban design criteria place considerable emphasis on a proposed developments' responsiveness (in layout, built form, architecture and landscape design) to the landscape context and sensitivities in the receiving environment. Such responsiveness is effectively 'embedded mitigation' in design. The analysis in Table 9.6 above shows that the proposed development responds appropriately and effectively to the site and its context. No further mitigation measures are required/recommended.

17.12 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

17.12.1 CONSTRUCTION PHASE

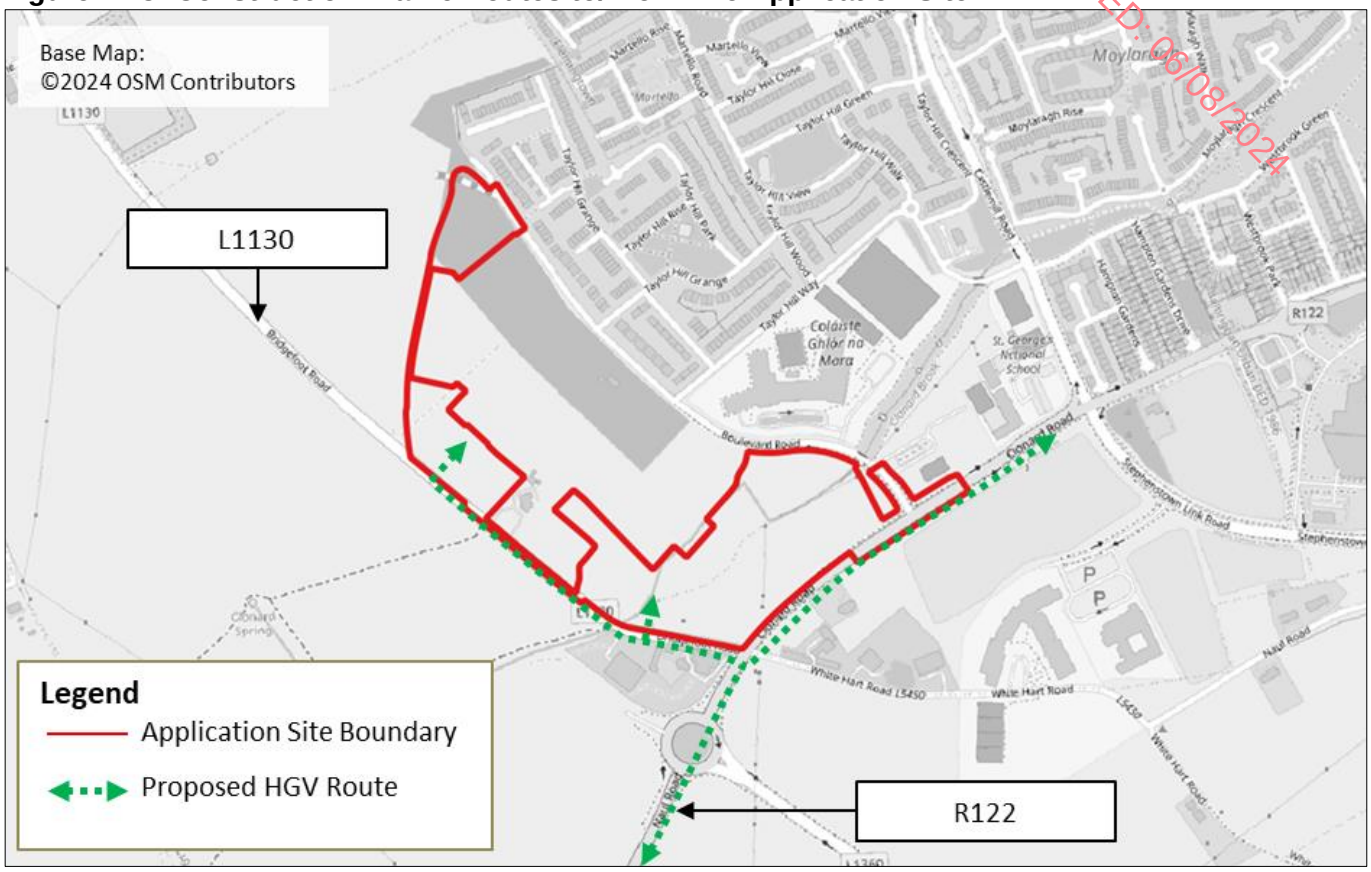
As noted in Section 11.7.2, an Outline Construction Traffic Management Plan (CTMP) has been prepared by Transport Insights and is included as a section in the TTA Report and the CEMP included in Appendix D of Volume III of the EIAR. The Outline CTMP addresses likely human health risks and documents construction practices and measures that can be adopted to minimise any effects on road users during the proposed development's construction phase. The Outline CTMP's overarching objectives are to:

- limit construction traffic impacts on nearby local roads by routing construction traffic along the regional and national road network, where possible;
- avoid conflict between construction traffic activities and general traffic/ pedestrians/ cyclists in the general vicinity of the site; and
- set out appropriate construction staff car parking arrangements so as to avoid overspill car parking on the local road network and resulting potential for traffic hazards.

The CEMP including the measures outlined in the CTMP will be included in the updated contractors CEMP.

In accordance with the CTMP, the set HGV haulage routes are to be strictly adhered to, as illustrated in the following Figure 11.15.

Figure 17.3: Construction Traffic Routes to/ from The Application Site



Furthermore, the following actions will be undertaken in accordance with the Outline CTMP:

- All construction staff parking will be accommodated in temporary parking areas within the site, which will have capacity for ca. 50 no. vehicles;
- A Construction Staff Mobility Management Plan (CSMMP) for the site will be developed by the contractor and implemented prior to construction works commencing;
- Just-in-time deliveries will be arranged where feasible;
- Construction materials will, where feasible, be sourced from local suppliers and manufactures, thus, minimising wider impacts of construction traffic;
- The site will operate from 07:00hrs to 19:00hrs on weekdays and from 07:00hrs to 14:00hrs on Saturday. No works will be undertaken on Sundays or Bank Holidays without the consent of FCC;
- A signage plan will be developed and implemented, providing advance warning of the construction access junction, and likelihood of slow-moving turning traffic to/ from the site. An outline signage plan is included in the outline CTMP;
- Compliance with the CTMP will form part of written contracts between the principal contractor and nominated sub-contractors
- Methods of handling materials on site will be in accordance with construction site health and safety requirements;
- Where required, construction vehicles will be inspected prior to exit from the site to ensure that dirt is not spread onto the adjoining road, and systems shall be put in place to facilitate this process, including an on-site cleaning area and/ or rumble grid; and
- The principal contractor will comply at all times with FCC requirements, including but not limited to hoarding/ scaffolding licences, skip licences etc; and

- The CTMP will be monitored constantly throughout the proposed construction programme and updated as needed to reflect the evolving needs of the project. The process for monitoring and updating the CTMP will be in accordance with FCC requirements

A detailed Construction Management Plan will be prepared post-planning by the selected construction contractor expanding on the outline plan, and the document will be submitted for approval to Fingal County Council Road prior to the commencement of any construction works. The CMP will include the mitigation contained in this EIAR including the CTMP.

The CTMP will ensure that suitable temporary traffic works, and road safety measures are put in place during the construction phase. The plan will ensure that any required traffic management measures are put in place to minimise the impact on local road users. Construction related traffic will access/ egress the site via the R122 and Boulevard Road. In general, the impact of the construction period will be temporary in nature and will cease following completion of the works. No significant effects are likely to occur due to construction phase traffic.

The applicant will appoint a dedicated construction manager and construction traffic manager. The construction traffic manager will be required to coordinate and schedule all deliveries to the site, ensure that the access roads are kept clear of mud and debris, advise haulage contractors on the appropriate routes to and from the site, and to adhere to good traffic management principles. In this way, the impacts of the construction phase can be appropriately managed. No significant effects are expected.

17.12.2 OPERATIONAL PHASE

Balbriggan provides suitable infrastructure and transport services to enable travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car.

To encourage sustainable transport use and help reduce potential traffic impacts, a Framework Mobility Management Plan (MMP) has been prepared by Transport Insights and is included as a section in the TTA and MMP Report.

17.12.2.1 MMP Objectives and Measures

Considering the site's accessible location, multiple employment and educational destinations within its walking, cycling, and public transport catchment and access to high-quality public transport services, the overarching objectives of the MMP are to:

- promote sustainable travel choices (walking, cycling and public transport); and
- support car-free lifestyle among residents and visitors of the development.

To achieve the mode share targets in the MMP, the following actions will be undertaken:

- Appointment of a Residential Travel Plan Co-Ordinator (MMPC)
- Promotion of the public transport TaxSaver scheme and Cycle to Work scheme
- Provision of secure cycle parking at a rate of 2 no. spaces per unit, where no direct external access to private open space is available
- Promotion of walking as active travel in residents Sustainable Transport Information Pack
- Incentivising Active Commuters

The Framework document sets out a clear set of objectives and identifies measures to help achieve the stated objectives, as well as appropriate monitoring and marketing techniques. Following occupation of the site and appointment of an MMPC, it is recommended that the Action Plan included in the MMP be further developed. The Action Plan will remain a 'living' document thereafter and should be updated periodically.

17.12.3 MONITORING

17.12.3.1 Construction Phase

During the construction stage the following monitoring exercises will be carried out. The specific compliance exercises to be undertaken in regard to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and external road conditions, and
- Timings of construction activities.

The CTMP will be monitored constantly throughout the proposed construction programme and updated as needed to reflect the evolving needs of the project. The process for monitoring and updating the CTMP will be in accordance with FCC requirements.

17.12.3.2 Operational Phase

It is important to monitor and update the MMP to ensure the actions are being implemented and that action is sustained over time. It also provides an opportunity for the effectiveness of actions to be assessed, and if required, new actions identified. The following steps are recommended to monitor progress:

- Informed by a residents and visitors travel survey, the MMP should be updated within 3 months of site occupation; and the Action Plan tailored to meet the specific requirements of its residents and visitors.
- A resident and visitor travel survey should be carried out annually thereafter, forming the baseline from which the MMP's future performance is measured, and additional/ amended interventions identified.
- A review of the actions carried out or due should be carried out by the MMPC every six months. This should take the form of a memo to the scheme's management company, documenting actions implemented, residents' feedback etc.

17.13 MATERIAL ASSETS – UTILITIES

All possible measures will be taken to avoid unplanned disruptions to any services within the site during construction of the proposed development. It should be noted that a number of mitigation measures are proposed in other chapters of this EIAR, which are collated into Chapter 17 of this EIAR. The mitigation measures contained in Chapter 17 of the EIAR will be incorporated into the Contractor's CEMP.

It should be noted that a number of mitigation measures are proposed in other chapters of this EIAR. Mitigation measures proposed in respect to Material Assets are as follows:

17.13.1 CONSTRUCTION STAGE

The following mitigation measures are proposed for the construction phase of the development with respect to Material Assets:

- The proposed development will comply with the provisions of the Resource Waste Management Plan prepared by AWN included in Appendix E of Volume III of the EIAR, with respect to construction waste.
- The proposed development will comply with the provisions of the Construction Environmental Management Plan included in Appendix E of Volume III of the EIAR.
- Water metering will be provided during the construction phase to record consumption.

- All new services will be constructed and provided in strict accordance with the relevant codes of practice.

17.13.2 OPERATION STAGE

- All new foul and surface water drainage pipes to be pressure tested and CCTV to identify any possible defects
- Water conservation measures to implemented, which include water metering, recycling vehicle wash waters, rainwater capture, low flush, waterless urinals, spray taps, efficiency attachments.
- Ensure that all Hydrobrakes are designed to limit the flow of water from the development to the greenfield run off.
- All watermain pipes to be pressure tested in accordance with Uisce Eireann details.

In addition, construction stage mitigation measures are also provided in Table 12.4 below.

Table 17:3: Operational Stage Mitigation Measures

Character of potential impact	Mitigation measure
Construction Phase	
Damage to existing utilities	Contractor will prepare Method Statement detailing the proposals for works in the vicinity of existing utilities (method statement to be agreed with Project Supervisor Design Process (PSDP)
Contamination of surface water runoff due to construction activities	Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
Improper discharge of foul drainage from contractor's compound	Foul drainage discharge from the construction compound will be transported off site to a licensed facility until a connection to the public foul drainage network has been established.
Cross contamination of potable water supply to construction compound	The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
Damage to existing underground and overground infrastructure and possible contamination of the existing systems with construction related materials.	A site-specific Construction & Environmental Management Plan will be developed and implemented during the construction phase. Please refer to PMCG Construction & Environmental Management Plan.
Potential loss of connection to the Telecommunications infrastructure while carrying out works to provide service connections	Connections to the existing telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
Operational Phase	
Increased impermeable surface area will reduce local ground water recharge and potentially increase surface water runoff	Please refer to Chapter 6.0 – Water Hydrogeology and Hydrology for mitigation measures associated with the surface water treatment.
Accidental hydrocarbon leaks and subsequent discharge into piped surface water	Please refer to Chapter 6.0 – Water Hydrogeology and Hydrology for mitigation measures associated with the surface water treatment.

drainage network (e.g. along roads and in driveway areas).	
Increased discharge to foul drainage network	Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.
Increased potable water consumption	Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.
Contamination of surface water runoff from foul sewer leaks.	All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

17.14 MATERIAL ASSETS – WASTE MANAGEMENT

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concepts of the 'waste hierarchy' and "circular economy" are employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. A circular economy is a model of resource production and consumption in any economy that involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible.

17.14.1 CONSTRUCTION PHASE

The following mitigation measures will be implemented during the construction phase of the proposed development:

- As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the EPA 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as Appendix E 13.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix E 13.1 Volume III of the EIAR) in agreement with FCC, or submit an addendum to the RWMP to FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.

- The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.

- A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:

- Concrete rubble (including ceramics, tiles and bricks);
- Plasterboard;
- Metals;
- Glass; and
- Timber.

- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager (RM) will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate potential reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 (By-products), as amended, European Union (Waste Directive) Regulations 2011-2020. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997 and the NWCPE. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

17.14.2 OPERATIONAL PHASE

The following mitigation measures will be implemented during the operational phase of the proposed development:

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

As previously stated, a project specific OWMP has been prepared and is included as **Appendix E 13.2 Volume III of the EIAR**. The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the NWMPCE, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the FCC waste bye-laws.

The Facilities Management Company / Residents / Tenants of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation

of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.

In addition, the following mitigation measures will be implemented:

- The Facilities Management Company / Residents / Tenants will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time-to-time other bulky waste); and
  - Abandoned bicycles.
- The Facilities Management Company / Residents / Tenants will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Facilities Management Company / Residents / Tenants will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Facilities Management Company / Residents / Tenants will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, The NWMPCE and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

17.14.3 MONITORING

The management of waste during the construction phase will be monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator / Facilities Management to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

17.14.3.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The mitigation measures in the RWMP specify the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify

the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

17.14.3.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the Operator / Facilities Management against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

17.15 CULTURAL HERITAGE

17.15.1 CONSTRUCTION PHASE

17.15.1.1 Archaeology

It is acknowledged that preservation in-situ of archaeological remains is the preferred method in which to conserve the archaeological resource. However, due to the requirements of the proposed development, this is not possible. Therefore, prior to the commencement of construction, the four archaeological areas will be subject to preservation by record (archaeological excavation). This will be carried out by an archaeologist under licence from the DoHLGH.

Prior to the commencement of construction, an archaeological wade survey will be carried out on sections of the Clonard Stream, which will be impacted by the construction of road and footpath crossings. This will be carried out by an underwater archaeologist under licence from the National Monuments Service of the DoHLGH. Dependant on the results of the survey, further mitigation may be required, such as preservation by record, or in-situ and/or archaeological monitoring.

All topsoil stripping associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

17.15.1.2 Architectural

As there are no predicted impacts on the architectural resource, no mitigation is deemed necessary.

17.15.1.3 Cultural Heritage

As there are no predicted impacts on the cultural heritage resource (with the exception of those described in relation to archaeological heritage), no mitigation is deemed necessary.

17.15.2 OPERATIONAL PHASE

As there are no predicted impacts on the archaeological, architectural, or cultural heritage resource during the operational phase, no mitigation is deemed necessary.

17.15.3 MONITORING

The mitigation measures detailed above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the mitigation measures.

17.16 RISK MANAGEMENT FOR MAJOR ACCIDENTS

The Construction Environmental Management Plan (contained in Appendix D Volume III of the EIAR) and the Health and Safety Plan (which will be developed and included in the final Contractor's CEMP) will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations. The CEMP along with the mitigation measures contained in this EIAR will be implemented as part of the construction of the project.

The proposed development will involve the ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. Further site investigation and WAC (Waste Acceptance Criteria) testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licenced facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.

- In the event of storms or snow, construction activity can be halted, and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.

- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short-term disruption to local residents and reduce the potential for accidents.

- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.

- With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site-Specific Flood Risk Assessment, prepared by MPA Consulting Engineers. The site is located in Flood Zone C where development and is not at risk of fluvial, pluvial or groundwater flooding.

- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.

- Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.

- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.

- Safety briefings will be held regularly and prior to any onerous or special task. *'Toolbox talks'* will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.

- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.

- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 17.4: Strategy for tackling potential risks.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (I) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium) ; or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
1	Work which puts persons at risk of:-burial under earth falls. Risk of burial under earthfalls in trenches.	Project Supervisor Construction Stage (PSCS)	H	M	Contractor to address requirement for trench support. Excavations are to be carried out at safe slope. Refer to site investigation for same and temporary works engineer to design.
2	Scaffolding Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.
3	Fire Strategy Risk of fire damage to houses or to partially complete new apartment blocks from construction activities.	PSCS/ PSDP / Fire SC.	H	M	Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required.
4	Lifting Operations Work involving the assembly or dismantling of heavy pre-fabricated components. Risk of injury during the assembly of precast columns, stairs, façade panels, etc.	PSCS/PSDP	H	M	Lifting operations using cranes will be a requirement during the project. The PSDP must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.
5	Existing Utilities Work near overhead electric cables, risk of Electrocution	PSCS/PSDP	H	M	The PSDP must highlight the existence of live overhead ESB cables on site. The sequence of work to be planned to avoid working in close proximity to the lines. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					risk assessed RAMS document to manage this hazard.
6.	Construction Traffic Working adjacent to live construction and normal traffic.	PSCS/PSDP	H	M	Contractor to prepare and implement a Construction Traffic Management Plan to be agreed with the design team to ensure public safety. The contractor is to supervise vehicle movements during construction and enforce the traffic management plan.

17.16.1 MONITORING

Monitoring will occur as per the Contractor's CEMP. No monitoring is required during the operational phase.