9 AIR QUALITY

9.1 Introduction

This chapter assesses the likely impacts to air quality associated with the proposed Media Park development at Grange Castle Business Park, Dublin.

9.1.1 Statement of Authority

This chapter of the EIAR has been prepared by Ciara Nolan, a senior environmental consultant in the air quality and climate section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. Eng. in Energy Systems Engineering. She is a Member of both the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Science (MIEnvSc). She has over 7 years' of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical and data centre.

9.1.2 Description of the Subject Site

The proposed development will comprise the construction of studio/sound stages with ancillary support offices, workshop buildings a TV studio building, outdoor stage areas, a TV studio and reception building, outdoor stages, a dining hall building, a standalone café, hardstanding areas including a backlot area and shooting lanes, production suite buildings, 3-storey car parking deck with ancillary offices, an electrical substation, gate houses, surface car parking and HGV parking area, a waste collection area, rooftop PV panels, green roofs and associated development works, ~~and~~ landscaping [amended text] **and a biodiversity buffer area along the northern boundary of the site and abutting the Grand Canal NHA** [amended text]. A full description of the proposed development is provided in Chapter 3.

9.2 Methodology

9.2.1 Assessment Criteria

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland, the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values, or "Air Quality Standards", are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC. The Air Quality Standards Regulations 2022 has set limit values for numerous pollutants with the limit values for NO_2, PM_{10}, and $PM_{2.5}$ being relevant to this assessment as these may be emitted from activities associated with the proposed development. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its

subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$ are set out in Table 9.1.

Pollutant	Regulation[Note1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m²/day
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m³
		Annual limit for protection of human health	40 µg/m³
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m³
		Annual limit for protection of human health	40 µg/m³
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m³

Note 1: EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Table 9.1: Ambient Air Quality Standards & TA Luft

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (shown in Table 9.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m³. The strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*". Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets. At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 9.1.

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50 µg/m³	50 µg/m³	25 µg/m³
		Annual limit for protection of human health	30 µg/m³	20 µg/m³	10 µg/m³
PM (as PM_{10})		24-hour limit for protection of human health	75 µg/m³	50 µg/m³	45 µg/m³
		Annual limit for protection of human health	30 µg/m³	20 µg/m³	15 µg/m³
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5 µg/m³	25 µg/m³	15 µg/m³

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
		Annual limit for protection of human health	15 µg/m^3	10 µg/m^3	5 µg/m^3

Table 9.2: WHO Air Quality Guidelines

Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns. The EU ambient air quality standards outlined in Table 9.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled '*Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)'* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value is appropriate to be implemented with regard to potential dust impacts from construction of the proposed development.

Air Quality & Traffic Impact Significance Criteria

The TII document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do Nothing scenario. The TII significance criteria are outlined in Table 4.9 of Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022a) and reproduced in Table 9.3 below. These criteria have been adopted for the proposed development to predict the impact of NO_2, PM_{10} and $PM_{2.5}$ emissions as a result of traffic from the proposed development.

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Limit Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: TII (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Table 9.3: TII Air Quality Significance Criteria

9.2.2 Construction Phase

Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (~~2014~~ [amended text] **IAQM, 2024** [amended text]) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022a).

The major dust generating activities are divided into four types within the IAQM guidance (~~2014~~ [amended text] **2024** [amended text]) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Construction Phase Traffic Assessment

Construction phase traffic can also impact air quality. The TII guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5 m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and, therefore, does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

9.2.3 Operational Phase

Operational Phase Traffic Assessment

Operational phase traffic can impact local air quality due to increased vehicle movements associated with the proposed development.

[amended text] **Updated traffic surveys were conducted in September 2024 as part of the response to the further information request (RFI) on the planning application for the site. These updated traffic surveys recorded vehicle movements that were lower than in the original surveys conducted in October 2023. The following assessment, of operational phase air quality impacts from traffic emissions, has not been updated with the revised September 2024 traffic figures and has been based on the original assessment and traffic surveys undertaken in October 2023. The 2023 figures are considered 'worst-case' in relation to potential air quality impacts from traffic emissions due to the higher number of vehicles recorded. The number of vehicles associated with the proposed development will not change and is the same as previously assessed.** [amended text]

The TII scoping criteria detailed in Section 9.2.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. The proposed development will cause the operational phase traffic to increase by more than 1,000 AADT on 1 no. road link, the Grange Castle West Access Road to the site. Therefore, a detailed air dispersion modelling assessment of operational phase traffic emissions was conducted. To provide for a worst-case assessment and to assess potential cumulative impacts, the traffic data has included specific cumulative developments within the area (see Traffic and Transport Assessment and Chapter 13 for further details).

The impact to air quality due to changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022a) states that a proportionate number of representative receptors, which are located in areas which will experience the highest concentrations or greatest improvements because of the proposed development, are to be included in the modelling. The TII criteria state that receptors within 200 m of impacted road links should be assessed; roads which are greater than 200 m from receptors will not impact pollutant concentrations at that receptor (TII, 2022a). The TII guidance (2022a) defines sensitive receptor locations for the purposes of modelling annual mean pollutant concentrations as: residential housing, schools, hospitals, care homes and short term-accommodation such as hotels, i.e. locations where members of the public are likely to be regularly present for 24 hours. A total of 1 no. high sensitivity residential receptor (R1) was included in the modelling assessment (see Figure 9.1).

The TII guidance (2022a) states that modelling should be conducted for NO_2, PM_{10} and $PM_{2.5}$ for the Base Year, Opening Year and Design Year for both the Do Minimum (Do Nothing) and Do Something scenarios. Modelling of operational NO_2, PM_{10} and $PM_{2.5}$ concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2022c).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The Default fleet mix option was selected along with the Intermediate Case fleet data base selection, as per TII Guidance (TII,

2022c). The Intermediate Case assumes a linear interpolation between the Business as Usual case – where current trends in vehicle ownership continue and the Climate Action Plan (CAP) case – where adoption of low emission light duty vehicles occurs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII, 2022c). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII guidance (2022a) also states that impacts to sensitive ecology due to traffic emissions should be considered. Consideration should be given to designated sites within 2km of the proposed development; however, a detailed assessment is only required at a local level, where there is a designated site within 200 m of impacted road links. The TII guidance (TII, 2022a) notes that only sites that are sensitive to nitrogen and acid deposition need to be included in the assessment. It is not necessary to include sites for example that have been designated as a geological feature or water course. The Grand Canal pNHA is located directly to the north of the proposed development. However, this designated site is not within 200 m of an impacted road link. A detailed assessment of NO_X concentrations and nitrogen deposition has been screened out as there is no potential for significant impacts to the designated sites due to changes in air quality.

Traffic Data used in Modelling Assessment

Traffic flow information was obtained from Barrett Mahony, the consulting engineers on the project, for the purposes of this assessment. Data for the Base Year 2023 and the Do Nothing and Do Something scenarios for the Opening Year 2026 and Design Year 2040 were provided. The traffic data has included specific cumulative developments within the area to provide for a worst-case assessment and to assess potential cumulative impacts (see Traffic and Transport Assessment and Chapter 13 Material Assets – Traffic & Transportation for further details).

The traffic data is detailed in Table 9.4. Only road links that met the TII scoping criteria and that were within 200 m of receptors were included in the modelling assessment. The Grange Castle West Access road is currently under construction and is not yet operational. Therefore, the traffic figures are zero for the Base Year 2023 and the Do Nothing scenario, without the proposed development in place. The road will serve as the primary access road to the proposed development once operational.

Background concentrations have been included as per Section 9.3.2 of this chapter based on available EPA background monitoring data (EPA, 2023).

Road Name	Speed (kph)	Base Year 2023	Opening Year 2026		Design Year 2040	
			Do Nothing	Do Something	Do Nothing	Do Something

		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Grange Castle West Access	50	0 (0)	0 (0)	1,030 (30)	0 (0)	1,030 (30)

Table 9.4: Traffic Data used in Operational Phase Air Quality Assessment

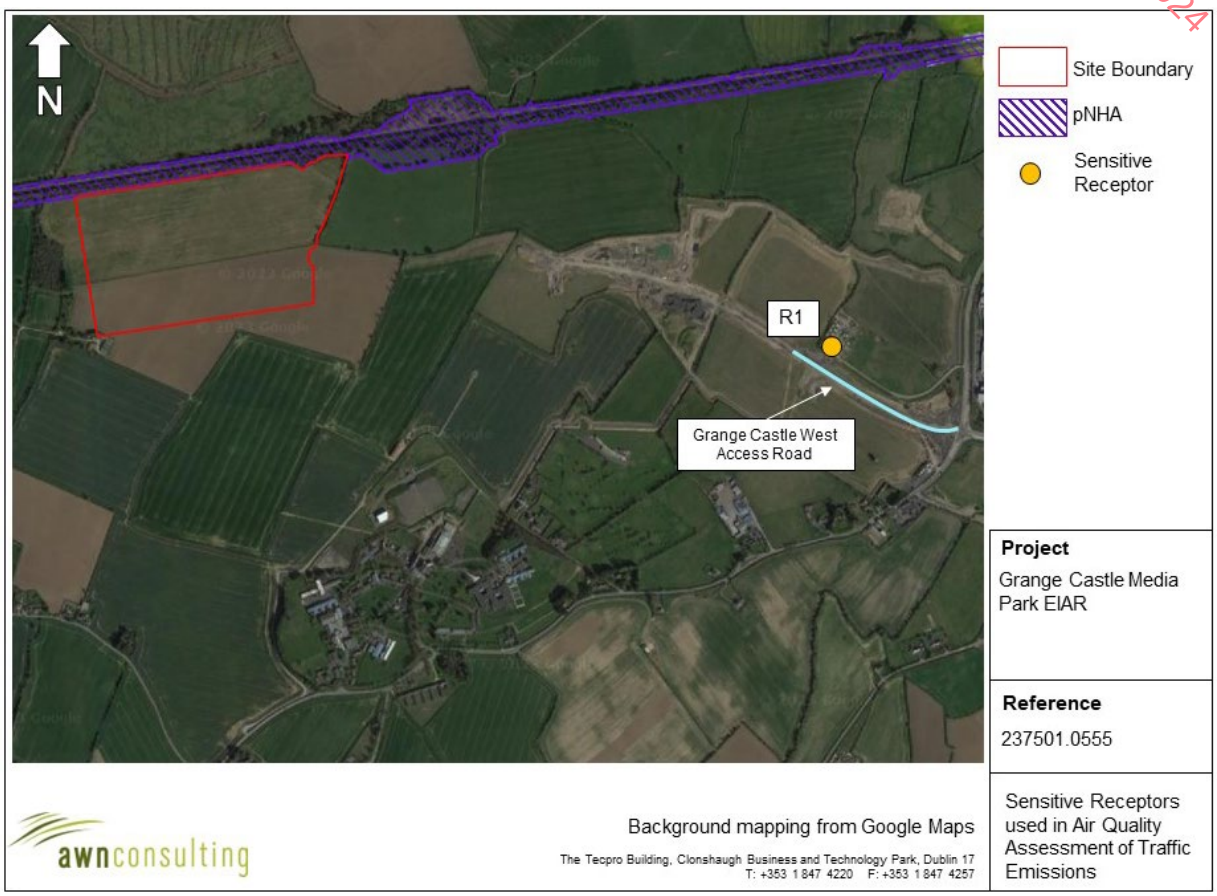


Figure 9.1: Sensitive Receptors used in Air Quality Assessment of Traffic Emissions

9.3 Receiving Environment

9.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions where pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome meteorological station. This meteorological station is located approximately 3 km south-east of the site. Casement Aerodrome meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.2). For data collated during five representative years (2018 – 2022) the predominant wind direction is westerly to south-westerly with generally moderate wind speeds averaging 5.2 m/s for the period 1991 – 2020 (Met Eireann, 2023).

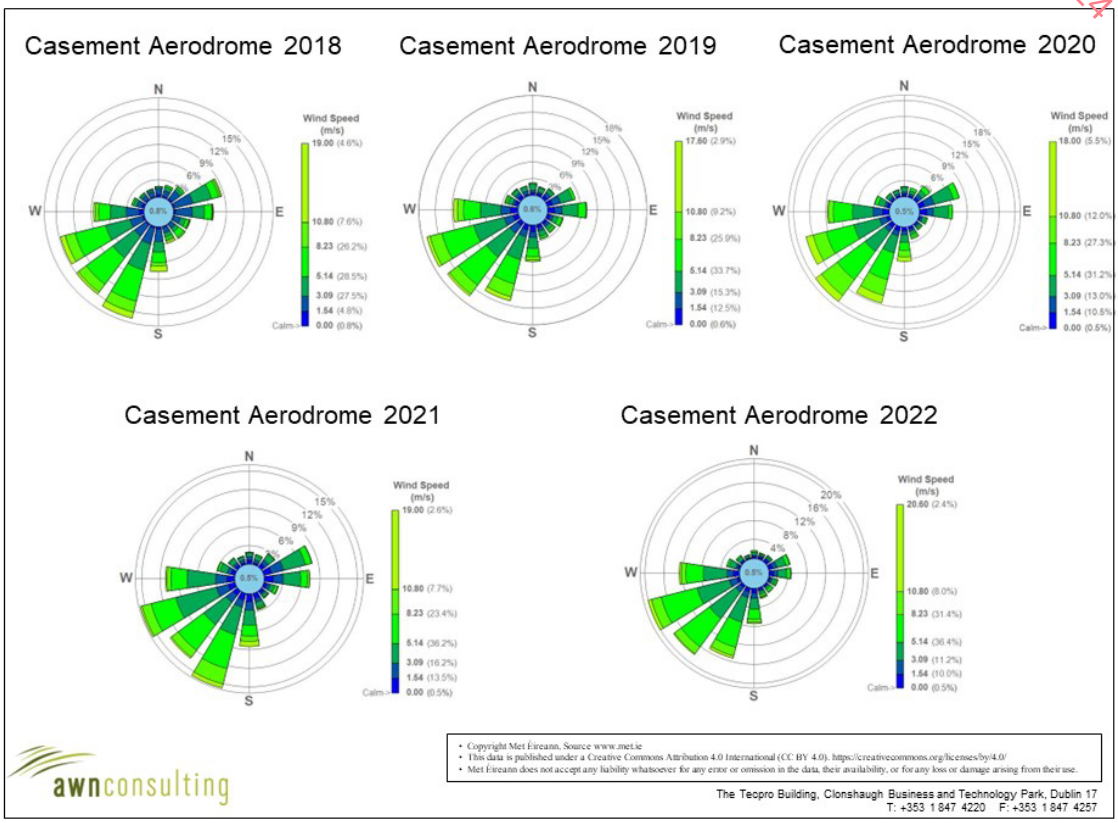


Figure 9.2: Casement Aerodrome Windroses 2018 - 2022

9.3.2 Baseline Air Quality

The EPA and Local Authorities have undertaken air quality monitoring programs in recent years. The most recent EPA published annual report on air quality "Air Quality In Ireland ~~2022~~ [amended text] **2023** [amended text]" (EPA, ~~2023~~ [amended text] **2024** [amended text]) details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled 'Air Quality In Ireland 2022' (EPA, ~~2023~~ [amended text] **2024** [amended text]). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air monitoring, Grangecastle and the area of the proposed development are categorised as Zone A.

NO_2

With regard to NO_2, continuous monitoring by the EPA (EPA, ~~2023~~ [amended text] **2024** [amended text]) shows that, at suburban and urban Zone A background locations in Rathmines, Ballyfermot, Dun Laoghaire and Swords, the current levels of NO_2 are below both the annual and 1-hour limit values. The annual average levels observed over the period ~~2018 – 2022 range from 11 – 22 µg/m³~~ [amended text] **2018 – 2023 range from 11 – 22 µg/m³** [amended text] (see Table 9.5).

The station at Swords can be considered representative of the area of the proposed development due to it's location outside of the M50 and distance from the city centre. The concentrations of NO_2 at the Swords monitoring site ranged from 11 – 16 µg/m³ over the period ~~2018 – 2022~~ [amended text] **2018 – 2023** [amended text]. Based on these results an estimate of the current background NO_2 concentration in the region of the proposed development is 16 µg/m³.

Station	Averaging Period	Year					
		2018	2019	2020	2021	2022	2023
Rathmines	Annual Mean NO_2 (µg/m³)	20	22	13	14	14	15
	99.8th%ile 1-hr NO_2 (µg/m³)	87	102	81	69	73	-
Ballyfermot	Annual Mean NO_2 (µg/m³)	17	20	12	13	13	13
	99.8th%ile 1-hr NO_2 (µg/m³)	101	101	83	73	81	-
Dun Laoghaire	Annual Mean NO_2 (µg/m³)	19	15	14	16	16	13
	99.8th%ile 1-hr NO_2 (µg/m³)	91	91	78	73	77	-
Swords	Annual Mean NO_2 (µg/m³)	16	15	11	11	12	10
	99.8th%ile 1-hr NO_2 (µg/m³)	85	80	65	63	70	-

Note 1: Hourly data for ~~2022~~ [amended text] 2023 [amended text] not yet available

Table 9.5: Trends In Zone A Air Quality – Nitrogen Dioxide (µg/m³)

PM_{10}

Long-term PM_{10} monitoring was carried out at the suburban and urban Zone A locations of Ballyfermot, Dun Laoghaire, Tallaght and Rathmines. Concentrations over the ~~2018 – 2022~~ [amended text] **2018 – 2023** [amended text] period are below both the annual and daily limit values (EPA, ~~2023~~ [amended text] **2024** [amended text]). The average annual mean concentrations range from 11 – 16 µg/m³ over the period ~~2018 – 2022~~ [amended text] **2018 – 2023** [amended text] (see Table 9.6). In addition, there were at most 9 exceedances (in Rathmines in 2019) of the daily limit value of 50 µg/m³, albeit 35 exceedances are permitted per year. Based on the above information of long-term air monitoring data for representative locations, an estimated background concentration of 13 µg/m³ has been used in this assessment.

Station	Averaging Period	Year					
		2018	2019	2020	2021	2022	2023
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	16	14	12	12	13	11
	24-hr Mean > 50 µg/m^3 (days)	0	7	2	0	1	0
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	13	12	12	11	12	12
	24-hr Mean > 50 µg/m^3 (days)	0	2	0	0	1	0
Tallaght	Annual Mean PM_{10} (µg/m^3)	15	12	10	10	11	11
	24-hr Mean > 50 µg/m^3 (days)	1	3	0	0	1	1
Rathmines	Annual Mean PM_{10} (µg/m^3)	15	15	11	12	15	15
	24-hr Mean > 50 µg/m^3 (days)	2	9	2	0	4	1

Table 9.6: Trends in Zone A Air Quality – PM_{10} (µg/m^3)

$PM_{2.5}$

Annual mean concentrations of $PM_{2.5}$ at the Zone A location of Rathmines, over the period ~~2018 – 2022~~ [amended text] **2018 – 2023** [amended text], ranged from ~~8 – 10 µg/m^3~~ [amended text] **7 – 10 µg/m^3** [amended text] (EPA, ~~2023~~ [amended text] **2024** [amended text]). Based on this information a background $PM_{2.5}$ concentration of 10 µg/m^3 has been used in this assessment.

Summary

Based on the above information the air quality in the area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2. There is the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, ~~2023~~ [amended text] **2024** [amended text]).

The current estimated background concentrations have been used in the operational phase air quality assessment for both the Opening Year and Design Year as a conservative approach to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022a).

9.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (~~2014~~ [amended text] **2024** [amended text]), prior to assessing the impact of dust from a Proposed Development, the sensitivity of the area must first be assessed, as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties (where people are likely to spend the majority of their time), schools and hospitals. Commercial premises and places of work are regarded as medium sensitivity and places where people are present for short periods, or do not expect a high level of amenity, are regarded as low sensitivity.

The sensitivity of the area to dust soiling effects and dust-related human health effects are first considered. The IAQM guidance (~~2014~~ [amended text] **2024** [amended text]) states that where there are no sensitive human receptors present within 250 m of the site, then no assessment of dust impacts is required.

In terms of receptor sensitivity to dust soiling, there is 1 no. high sensitivity residential receptor within 100 m of the site boundary (see Figure 9.3). There are 2 no. additional residential receptors further than 100 m but within ~~350 m~~ [amended text] **250 m** [amended text] of the site boundary. The Peamount Hospital is located approximately 650 m to the south of the site (see Figure 9.3). Based on the location of the sensitive receptors and their distance from the site, and per the IAQM criteria outlined in Table 9.7, the worst-case sensitivity of the area to dust soiling impacts is considered low.

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	~~<350~~ [amended text] <250 [amended text]
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	**Low**	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 9.7: Sensitivity of the Area to Dust Soiling Effects on People and Property

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 13 µg/m^3. There is 1 no. high sensitivity residential property within 100 m of the proposed development boundary (see Figure 9.3). Additionally, Peamount Hospital, which is considered a highly sensitive receptor is approximately 650 m to the south of the site. Based on the IAQM criteria outlined in Table 9.8, the worst-case sensitivity of the area to dust-related human health impacts is low.

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	~~<200~~[amended text] <250 [amended text]
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	**Low**	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

Table 9.8: Sensitivity of the Area to Dust Related Human Health Impacts

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site, and 50 m from site access roads, up to 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present.

A section of the Grand Canal pNHA is to the direct north and is within 20m of the proposed development site boundary (see Figure 9.3). This site is considered a low sensitivity receptor according to the IAQM guidance (~~2014~~ [amended text] **2024** [amended text]) due to its local designation and the potential for dust sensitive species to be present. As per the criteria in Table 9.9, the sensitivity of the area to dust-related ecological effects is low.

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	**Low**	Low

Table 9.9: Sensitivity of the Area to Dust-Related Ecological Effects

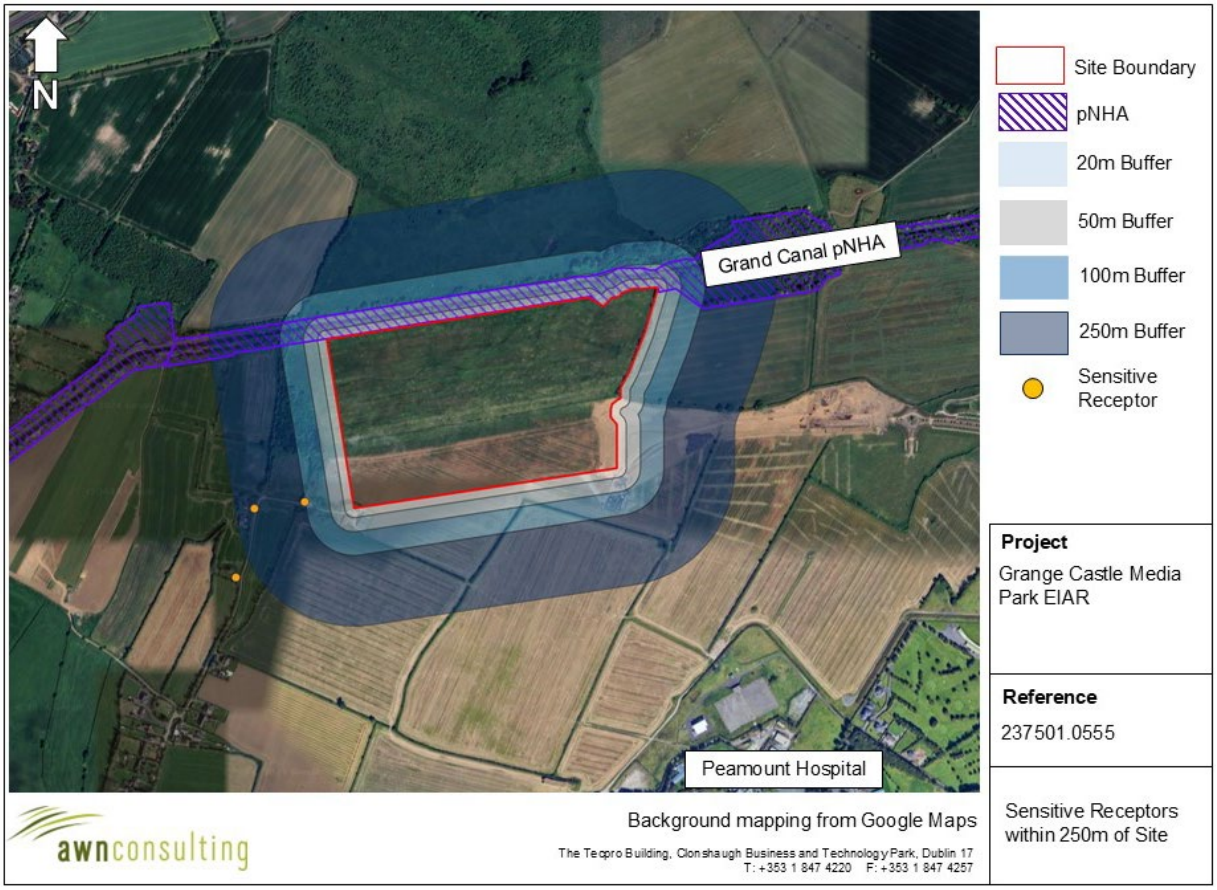


Figure 9.3: Sensitive Receptors within ~~350 m~~ [amended text] 250 m [amended text] of Site Boundary

9.4 Characteristics of the Proposed Development

The proposed development will comprise a media park at Grange Castle Business Park, Dublin 22. A full description of the development is available in Chapter 3.

In relation to air quality, impacts will occur during both the construction and operational phases of the development. During the construction stage, the main source of air quality impacts will be due to fugitive dust emissions from site activities. Dust emissions will primarily occur because of site preparation works, earthworks, construction of proposed buildings and the movement of trucks on site and exiting the site.

During the operational phase, air quality may be affected by increased traffic accessing the site. This can be attributed to a higher number of vehicles and the potential rise in vehicle exhaust emissions. Operational phase impacts will have a long-term impact on air quality.

9.5 Potential Impacts of the Proposed Development

9.5.1 Do Nothing Scenario

In the Do Nothing Scenario no construction works will take place and the identified impacts of fugitive dust and particulate matter emissions will not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends in the wider area (including influences from new developments in the surrounding area, changes in road traffic, etc.).

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 9.5.3 and it was found to be long-term, neutral and imperceptible.

Therefore, overall the Do Nothing scenario can be considered neutral in terms of air quality.

9.5.2 Construction Phase

Construction Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and potential nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Casement Aerodrome meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (see Figure 9.2). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Casement Aerodrome meteorological station indicates that, on average, 194 days per year have rainfall over 0.2 mm (Met Eireann, 2023). Therefore, it can be determined that 53% of the time dust generation will be reduced.

The potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see

Section 9.3.3), to determine the level of dust mitigation required during the proposed works. As per Section 9.2.2 the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

Demolition

There is no demolition proposed as part of the proposed development. Therefore, no impact is predicted.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- ~~**Large:** Total site area > 10,000m², potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8m in height, total material moved >100,000 tonnes;~~
- ~~**Medium:** Total site area 2,500m² – 10,000m², moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes;~~
- ~~**Small:** Total site area < 2,500m², soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.~~

[amended text]

- **Large Total site area > 110,000 m², potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 6m in height;**
- **Medium Total site area 18,000 m² – 110,000 m², moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height;**
- **Small Total site area < 18,000 m², soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 3m in height.**

[amended text]

The dust emission magnitude for the proposed earthwork activities can be classified as large as the total site area is greater than ~~10,000 m²~~ [amended text] **110, 000 m²** [amended text] and there will be over 100,000 tonnes of material involved in cut and fill works.

The sensitivity of the area, as determined in Section 9.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the

absence of mitigation. As the overall sensitivity of the area to dust soiling, dust-related human health and ecological impacts is low, when combined with a large dust emission magnitude, this produces an overall low risk of dust impacts (as per Table 9.10).

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	**Low Risk**	Low Risk	Negligible

Table 9.10: Risk of Dust Impacts – Earthworks

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- ~~**Large**: Total building volume >100, 000 m³, on site concrete batching, sandblasting;~~
- ~~**Medium**: Total building volume 25,000 m³ – 100,000 m³, potentially dusty construction material (e.g. concrete), on site concrete batching; and~~
- ~~**Small**: Total building volume <25,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).~~

[amended text]

- **Large Total building volume > 75,000 m³, on-site concrete batching, sandblasting;**
- **Medium Total building volume 12,000 m³ – 75,000 m³, potentially dusty construction material (e.g. concrete), on-site concrete batching;**
- **Small Total building volume < 12,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).**

[amended text]

The dust emission magnitude for the proposed construction activities can be classified as large as the total volume of buildings to be constructed will be greater than ~~100,000 m³~~ [amended text] **75,000 m³** [amended text]. As outlined in Table 9.11, this results in an overall low risk of dust soiling impacts and dust related human health and ecological impacts because of the proposed construction activities.

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	**Low Risk**	Low Risk	Negligible

Table 9.11: Risk of Dust Impacts – Construction

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- ~~**Large**: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100m;~~
- ~~**Medium**: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100m;~~
- ~~**Small**: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50m.~~

[amended text]

- **Large > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;**
- **Medium 20 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;**
- **Small < 20 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.**

[amended text]

The dust emission magnitude for the proposed trackout can be classified as medium. At worst-case peak periods there will be up to 5 outward HGV movements per hour which equates to approximately 40 outward movements per typical working day. However, there are unlikely to be unpaved site roads which will reduce the potential for dust emissions from vehicle movements. As outlined in Table 9.12, this results in an overall low risk of dust soiling impacts, dust related human health impacts and dust related ecological impacts due to the proposed trackout activities.

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	~~Negligible~~ [amended text] **Low Risk** [amended text]
Low	Low Risk	**Low Risk**	Negligible

Table 9.12: Risk of Dust Impacts – Trackout

Summary of Dust Emission Risks

The risk of dust impacts due to the proposed development are summarised in Table 9.13 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity to prevent significant impacts occurring.

There is at most a low risk of dust impacts associated with the proposed works. As a result, best practice dust mitigation measures associated with low risk sites will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be short-term, negative and imperceptible.

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	N/A	Large	Large	Medium
Dust Soiling	N/A	Low Risk	Low Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk
Ecology Risk	N/A	Low Risk	Low Risk	Low Risk

Table 9.13: Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out. None of the road links impacted by the proposed development satisfy the TII scoping assessment criteria in Section 9.2.2. It can, therefore, be determined that the construction stage traffic will have an imperceptible, direct, neutral and short-term impact on air quality.

9.5.3 Operational Phase

Operational Phase Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated because of the development. The traffic data has included specific cumulative developments within the area to provide for a worst-case assessment and to assess potential cumulative impacts (see Traffic and Transport Assessment and Chapter 13 for further details).

The traffic data includes the Do Nothing (DN) and Do Something (DS) scenarios. The impact of NO_2, PM_{10} and $PM_{2.5}$ emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO_2 in the Opening Year 2026 and Design Year 2040 are shown in Table 9.14. The annual average concentration is in compliance with the limit value at the worst-case receptor in 2026 and 2040. Concentrations of NO_2 are at most 40% of the annual limit value in 2026 in 2040. In addition, the TII guidance (2022a) states that the hourly limit value for NO_2 of 200 µg/m^3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m^3. As predicted NO_2 concentrations are significantly below 60 µg/m^3 (Table 9.14) it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations.

The impact of the proposed development on annual mean NO_2 concentrations can be assessed relative to "Do Nothing (DN)" levels. NO_2 concentrations at receptor R1 are predicted to increase because of the proposed development when compared with the Do-Nothing scenario. There will be at most a decrease of 0.17 µg/m^3 at receptor R1. When comparing the change in concentration with the air quality limit value, it reveals a maximum change of 0.4% at receptor R1.

The impact is considered neutral, as per the TII significance criteria (see Table 9.3), where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 9.1) and there is a less than 5% change in concentrations.

Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	16.0	16.2	0.17	0.4%	Neutral	16.0	16.1	0.06	0.1%	Neutral

Table 9.14: Predicted Annual Mean NO_2 Concentrations (µg/m^3)

In relation to changes in PM_{10} concentrations due to the proposed development, the results of the assessment can be seen in Table 9.15 for the Opening Year 2026 and Design Year 2040. The annual average concentration is in compliance with the limit value at the worst-case receptor in 2026 and 2040. Concentrations of PM_{10} are at most 33% of the annual limit value in 2026 and 2040. In addition, the proposed development will not result in any exceedances of the daily PM_{10} limit value of 50 µg/m^3. The impact of the proposed development on annual mean PM_{10} concentrations can be assessed relative to "Do Nothing (DN)" levels. PM_{10} concentrations will increase at receptor R1 because of the proposed development when compared with the Do-Nothing scenario. There will be at most a decrease of 0.14 µg/m^3 at receptor R1. This is a 0.4% increase when compared with the ambient air quality limit value of 40 µg/m^3.

As with NO_2, the impact is considered neutral, as per the TII significance criteria (see Table 9.3), where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 9.1) and there is a less than 5% change in concentrations. Therefore, the impact of the proposed development on PM_{10} concentrations is neutral.

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	13.0	13.1	0.14	0.4%	Neutral	13.0	13.1	0.14	0.4%	Neutral

Table 9.15: Predicted Annual Mean PM_{10} Concentrations (µg/m^3)

The results of the assessment of changes in $PM_{2.5}$ concentrations, due to the proposed development, can be seen in Table 9.16 for the Opening Year 2026 and Design Year 2040. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2026 and 2040. Concentrations of $PM_{2.5}$ are at most 40% of the annual limit value in 2026 and 2040. The impact of the proposed development on annual mean $PM_{2.5}$ concentrations can be assessed relative to "Do Nothing (DN)" levels. $PM_{2.5}$ concentrations at receptor R1 will increase because of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.08 µg/m^3 at receptor R1. This is

a 0.3% increase when compared with the ambient air quality limit value of 25 µg/m^3. As with NO_2 and PM_{10}, where the predicted annual mean concentrations are less than 75% of the air quality (see Table 9.1) and there is a less than 5% change in concentrations then the impact is considered neutral as per the TII significance criteria (see Table 9.3). Therefore, the impact of the proposed development on $PM_{2.5}$ concentrations is neutral.

Receptor	Impact Opening Year					Impact Design Year				
	DN	DS	DS-DN	% Change of AQAL	Description	DN	DS	DS-DN	% Change of AQAL	Description
R1	10.0	10.1	0.08	0.3%	Neutral	10.0	10.1	0.08	0.3%	Neutral

Table 9.16: Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)

Overall, the impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, neutral, imperceptible and non-significant.

9.6 Mitigation Measures

9.6.1 Construction Phase

The proposed development has been assessed as having a low risk of dust impacts during the construction phase because of earthworks, construction and trackout activities (see Section 9.5.2). 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 low 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 (2014), 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.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement involves 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.

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

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 use dust suppression/mitigation measures will be utilised.
- Cover, seed or fence stockpiles to prevent wind whipping.

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)

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.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate. This is to ensure moisture content is high enough to increase the stability of the soil and, therefore, suppress dust.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. If this is required for a particular process, then 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. This is 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.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective dust control measure 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 log book.
- 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 where reasonably practicable (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility (when required) and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

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. Cleaning is 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.

9.6.2 Operational Phase

No mitigation is proposed for the operational phase of the proposed development as impacts to air quality will be imperceptible.

9.7 Monitoring

9.7.1 Construction Phase

During working hours, dust control methods will be monitored as appropriate. This depends on the prevailing meteorological conditions. Monitoring of emissions is not proposed for the construction phase of the proposed development as impacts are predicted to be imperceptible. Once the dust mitigation measures outlined in the mitigation section are implemented, then construction dust emissions will be imperceptible.

9.7.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality are predicted to be imperceptible.

9.8 Residual Impacts

9.8.1 Construction Phase

Air Quality

When the dust mitigation measures detailed in the mitigation section of this report (Section 9.6.1) are implemented, then the residual effect of fugitive emissions of dust and particulate matter from the site will be short-term, direct, negative and imperceptible in nature. It will pose no nuisance at nearby receptors.

Human Health

Best practice mitigation measures are presented for the construction phase of the proposed development. They will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values. These limit values are based on the protection of human health. Therefore, the residual effect of construction of the proposed development will be short-term, direct, neutral and imperceptible with respect to human health.

9.8.2 Operational Phase

The residual effect of the operational phase impacts associated with the proposed development are predicted to be neutral, long-term and imperceptible.

9.9 Cumulative Impacts

9.9.1 Construction Phase

According to the IAQM guidance (2014), if the construction phase of the proposed development coincides with the construction phase of any other permitted projects within 350 m of the site, there is a possibility of cumulative dust impacts occurring at any nearby sensitive receptors.

Should simultaneous construction phase occur, it would lead to cumulative dust soiling and dust-related impacts on human health, specifically localised to the works area associated with the proposed works.

A review of the planned and permitted projects within the vicinity of the site was undertaken. 1 no. development within 350 m of the site was identified that may have the potential for cumulative construction phase impacts, SD23A/0301.

There is a low risk of dust impacts associated with the proposed development. The dust mitigation measures outlined in Section 11.6.1 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation

measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development and the aforementioned development are deemed short-term, direct, negative and imperceptible.

9.9.2 Operational Phase

There is the potential for cumulative impacts to air quality during the operational phase. This is due to traffic associated with other existing and permitted developments within the area. The traffic data provided for the operational stage air quality assessment included cumulative traffic (see Traffic Impact Assessment and Chapter 13 Material Assets – Traffic & Transportation for further details on specific developments). The cumulative operational phase impact is assessed within Section 9.5.3 and was found to have a neutral impact on air quality. The cumulative operational stage impact is long-term, localised, direct, neutral, imperceptible and non-significant.

9.10 Interactions

9.10.1 Air Quality and Human Health and Population

Construction Phase

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between Population and Human Health and Air Quality. An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the Proposed Development. Best practice mitigation measures will implemented during the construction phase to ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is short-term, negative and imperceptible with respect to Population and Human Health during the construction phase.

Operational Phase

Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the Proposed Development will not cause a significant change in air pollutant emissions in the locality. It has been assessed that emissions will be in compliance with the ambient air quality standards which are set for the protection of human health. Impacts will be long-term, neutral and imperceptible.

9.10.2 Air Quality and Climate

Air Quality and Climate have interactions. The emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

9.10.3 Air Quality and Land, Soils and Hydrogeology

Construction Phase

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land and Soils in the form of dust emissions. 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 during the construction phase.

Operational Phase
There are no potentially significant interactions identified between Air Quality, and Land and Soils during the operational phase.

9.10.4 Air Quality and Biodiversity

Construction Phase
Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. The Grand Canal pNHA is located to the north of the sit. It has been assessed that there is at most a low risk of dust-related ecological impacts occurring within the relevant section of the pNHA. Therefore, no significant impacts are predicted. Dust mitigation measures will be implemented on site as set out in Section 9.6.1 of Chapter 9 of the EIAR. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be short-term, negative and imperceptible with respect to biodiversity.

Operational Phase
There are no potentially significant interactions identified between Air Quality, and Biodiversity during the operational phase.

9.10.5 Air Quality and Material Assets – Traffic & Transport

Construction Phase
Interactions between Air Quality and Traffic can be significant. 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 short-term, imperceptible and neutral during the construction phase.

Operational Phase
The impact of the interactions between Traffic and Air Quality are considered to be long-term, imperceptible and neutral during the operational phase.

9.11 References

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of the Environment, Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

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

~~Environmental Protection Agency (2023) Air Quality in Ireland 2022 Report (& previous annual reports)~~
[amended text] **Environmental Protection Agency (2024) Air Quality in Ireland 2023 Report (& previous annual reports)** [amended text]

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2023) Clean Air Strategy for Ireland

~~Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1~~
[amended text] **Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction Version 2.2** [amended text]

Met Éireann (2023) Met Eireann website: https://www.met.ie/

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2022b) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

10 CLIMATE

10.1 Introduction

This chapter assesses the likely impacts to climate associated with the proposed Media Park development at Grange Castle Business Park, Dublin.

10.1.1 Statement of Authority

This chapter of the EIAR has been prepared by Ciara Nolan, a senior environmental consultant in the air quality and climate section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. Eng. in Energy Systems Engineering. She is a Member of both the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Science (MIEnvSc). She has over 7 years' of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical and data centre.

10.1.2 Description of the Subject Site

The proposed development will comprise the construction of studio/sound stages with ancillary support offices, workshop buildings a TV studio building, outdoor stage areas, a TV studio and reception building, outdoor stages, a dining hall building, a standalone café, hardstanding areas including a backlot area and shooting lanes, production suite buildings, 3-storey car parking deck with ancillary offices, an electrical substation, gate houses, surface car parking and HGV parking area, a waste collection area, rooftop PV panels, green roofs and associated development works, ~~and~~ landscaping [amended text] **and a biodiversity buffer area along the northern boundary of the site and abutting the Grand Canal NHA** [amended text]. A full description of the proposed development is provided in Chapter 3.

10.2 Methodology

The climate assessment comprises two main elements, these include:

- A greenhouse gas (GHG) assessment which assesses the impact of the proposed development on climate.
- A climate change vulnerability assessment which assesses the vulnerability of the proposed development to future climate change.

Firstly, the following sections detail the relevant guidelines, policy and legislation which drive the need for the climate assessment as well as the relevant criteria for assessing impacts to climate. Secondly, the significance criteria for the GHG assessment and climate change vulnerability assessment are set out. Lastly, the methodology used to conduct the construction and operational phase assessments is detailed.

10.2.1 Assessment Criteria

<u>Relevant Climate Guidelines, Policy and Legislation</u>

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable

Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050*' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'National Transition Objective'. The Act made provision for, inter alia, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council. The Climate Change Advisory Council advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture. It also outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023. A fourth revision of the CAP was published in December 2023.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b). This was followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans '*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'*. The 2021 Climate Act will also '*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'*. The 2021 Climate Act defines the carbon budget as '*the total amount of greenhouse gas emissions that are permitted during the budget period'*. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

In relation to carbon budgets, the Climate Action and Low Carbon Development (Amendment) Act states '*a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')*'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 10.1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation

to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published July in 2022 and are shown in Table 10.2. Industry has a 35% reduction required and emissions ceiling of 4 Mt CO_2e. Built Environment – Commercial has a 45% reduction required and emissions ceiling of 1 Mt CO_2e.

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from 'Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change'

Table 10.1: 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025 (Department of the Taoiseach, 2022)

Sector	Baseline (MtCO2e)	Carbon Budgets ($MtCO_2e$)		2030 Emissions ($MtCO_2e$)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Transport	12	54	37	6	50
Electricity	10	40	20	3	75
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Agriculture	23	106	96	17.25	25
LULUCF	5	TBC	TBC	TBC	TBC
Industry	7	30	24	4	35
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Unallocated Savings	-	7	5	-5.25	-
Total	**68**	**TBC**	**TBC**	-	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	**295**	**200**	-	**51**

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from 'Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change'

Table 10.2: Sectoral Emission Ceilings 2030 (Department of the Taoiseach, 2022)

In December 2024, CAP24 was published (Government of Ireland, 2023). This is the second CAP since the publication of the carbon budgets and sectoral emissions ceilings and builds on the progress of CAP23. It aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030 and 2050 net zero goal. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP24 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction

materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP24 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation's report Modern Methods of Construction 2021. The IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies to ensure economic growth can continue alongside a reduction in emissions.

In April 2023, the Government published a draft Long-term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland 2023). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan. The strategy will be updated following a second round of public consultation throughout 2023. An updated strategy will be published after consultation process is completed.

The South Dublin County Council (SDCC) Climate Change Action Plan published in 2019 (SDCC, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the South Dublin County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible. SDCC have developed a draft Climate Action Plan (2024-2029) which is currently out for consultation and will contain updated goals and plans for the area in relation to climate change.

As per the SDCC Climate Change Action Plan (SDCC, 2019) climate change adaptation is a key feature of climate assessments, the European Commission published '*Technical guidance on the climate proofing of infrastructure in the period 2021-2027*' (European Commission, 2021a). This document has been reviewed as part of the climate change vulnerability assessment. The technical guidance outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact.

Climate Assessment Significance Criteria

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- **Greenhouse Gas Emissions Assessment (GHGA)** – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- **Climate Change Risk Assessment (CCRA)** – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

Significance Criteria for Greenhouse Gas Assessment

The Transport Infrastructure Ireland (TII) guidance document entitled PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. The approach is based on comparing the 'Do Something' scenario and the net project GHG emissions (i.e. Do Something – Do Minimum) to the relevant carbon budgets (Department of the Taoiseach, 2022). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO_2 project GHG emissions from the proposed development. The Buildings – Commercial sector has a 2030 emissions ceiling of 1 Mt CO_2e.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects follow a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA significance determination and TII criteria. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero*[1] *by 2050*".

[1] Net Zero: "*When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.*" Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

Significance is determined using the criteria outlined in Table 10.3 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Effects	Significance Level	Description
Significant adverse	Major adverse	• The project's GHG impacts are not mitigated. • The project has not complied with Do-Minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	• The project's GHG impacts are partially mitigated. • The project has partially complied with Do-Minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor adverse	• The project's GHG impacts are mitigated through 'good practice' measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	• The project's GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	• The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Table 10.3: GHGA Significance Criteria

Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 10.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that

if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development is therefore considered to be not significant. However, where residual medium or high vulnerabilities exist, the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

		Exposure		
		High (3)	**Medium (2)**	**Low (1)**
Sensitivity	**High (3)**	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

Table 10.4: Vulnerability Matrix

10.2.2 Construction Phase

Greenhouse Gas Assessment

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013), the climate baseline must first be established with reference to EPA data on annual GHG emissions (see Section 10.3.1).

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022b). The TII Online Carbon Tool (TII, 2022b) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction/maintenance phase. The outputs are expressed in terms of tCO_2e (tonnes of carbon dioxide equivalent).

Given the nature of the proposed development, the use of the TII Carbon Tool was not considered suitable for the building elements. As such an alternative tool was used; the Carbon Designer for Ireland tool. The Irish Green Building Council in partnership with One Click LCA Ltd. have developed the Carbon Designer for Ireland tool (One Click LCA Ltd., 2023) for use on Irish specific building projects. The Carbon Designer tool is promoted by the EPA and the Land Development Agency. OneClickLCA is certified to EN 15978, EN 15978, ISO 21931–1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at an early stage using typical default materials and values. Inputs to the tool include the gross floor area and number of stories above ground level along with the building frame type. Once the baseline is established using generic data, the tool allows for optioneering and optimization of the carbon impact. It highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials. The Carbon Designer for Ireland tool has been used to assess the embodied carbon impact of the proposed development.

The carbon assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period (i.e. the assumed building life expectancy) for the purposes of the assessment is 50 years. Embodied carbon emissions are attributed to four main categories in the OneClick tool, taken from BS EN 15978. The categories are:

- Product Stages (category A1 to A3): The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products. These stages have been included within the scope of this assessment.

- Construction (category A4 to A5): These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building. This has been included within the scope of the assessment.

- In-Use Stages (category B1 to B5): This covers a wide range of sources from the embodied carbon emissions associated with the operation of the building, including the materials used during maintenance, replacement and refurbishment. Category B6 and B7 refer to operational emissions. In-Use Stages are not included in the assessment scope of this study as detailed information on building operation and energy use was not available at this stage in the assessment. Material refurbishment and replacement throughout the lifetime of the development (category B4 – B5) has been included within this assessment.

- End of Life Stages (category C1 to C4): The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No 'credit' is taken for any future carbon benefit associated with the reuse or recycling of a material into new products. This stage has not been included within the scope of this study as it is assumed that the building will not be demolished.

- Benefits and loads beyond the system boundary Module (D): Any potential benefit from the reuse, recovery and recycling potential of a building or a building product. This module is not included in the assessment scope of this study.

The assessment conducted as part of this EIAR included categories A1 – A5 and B4 – B5. All other categories were outside the scope of this assessment as detailed above. The assessment has been conducted using the Schedule of Areas provided by the project architects dated 27/11/2023. These areas for the various building types were input into the OneClick tool. Detailed information on building materials was not available at this stage in the project and; therefore, the assessment has assumed generic default values within the OneClick tool to provide an initial high-level assessment of the potential embodied carbon impact of the project.

10.2.3 Operational Phase

Climate Change Vulnerability Assessment

The operational phase assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.
PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 10.3.2, future climate change modelling and input from other experts working on the proposed development (e.g. hydrologists) should be used to assess the likelihood of a climate risk.

The initial stage of an assessment is to establish a scope and boundary for the assessment taking into account the following criteria:

- Spatial Boundary: As per PE-ENV-01104 (TII, 2022a), the study area with respect to the GHGA is Ireland's Climate budget. The study area with respect to the CCRA can be considered the project boundary and its assets. The study area will be influenced by current and future baselines (Section 10.3.2). This study area is influenced by the input of other experts within the EIAR team; The study area of the proposed development is the redline boundary.
- Climate Hazards: The outcomes of the climate screening i.e. vulnerability assessment and baseline assessment; and
- Project Receptors: TII state that the project receptors are the asset categories considered in the climate screening. In addition, any critical connecting infrastructure and significant parts of the surrounding environment e.g. water bodies that should be considered as a part of the indirect, cumulative and in combination impact assessment should also be considered project receptors.

Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a) outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact. The role of the climate consultant in assessing the likelihood and impact is often to facilitate the climate change risk assessment process with input from the design team or specific specialists such as hydrology. The climate screening risk assessment or vulnerability assessment is carried out by determining the sensitivity and exposure of the project to climate change. Firstly the project asset categories must be assigned a level of sensitivity to climate hazards irrespective of the project location (example: Sea level rise will affect seaport projects regardless of specific location). PE-ENV-01104 (TII, 2022a) provide the below list of asset categories and climate hazards to be considered. The asset categories will vary for project type and need to be determined on a project by project basis. The asset categories relevant to the proposed development include pavements, drainage, structures, utilities, landscaping and buildings.

- **Asset Categories:** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards**: Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in Table 10.4. TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Climate and Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

[amended text] **Updated traffic surveys were conducted in September 2024 as part of the response to the further information request (RFI) on the planning application for the site. These updated traffic surveys recorded vehicle movements that were lower than in the original surveys conducted in October 2023. The following assessment, of operational phase climate impacts from traffic emissions, has not been updated with the revised September 2024 traffic figures and has been based on the original assessment and traffic surveys undertaken in October 2023. The 2023 figures are considered 'worst-case' in relation to potential climate impacts from traffic emissions due to the higher number of vehicles recorded. The number of vehicles associated with the proposed development will not change and is the same as previously assessed.** [amended text]

~~The UK Highways Agency Design Manual for Roads and Bridges (DMRB) guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted~~

~~by the proposed development meet or exceed the below criteria, then further assessment is required.~~

- ~~A change of more than 10% in annual average daily traffic (AADT);~~
- ~~A change of more than 10% to the number of heavy duty vehicles (HDV); and~~
- ~~A change in daily average speed of more than 20 km/hr.~~

[amended text] **The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022c), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment, and also the climate assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.**

- **Annual average daily traffic (AADT) changes by 1,000 or more;**
- **Heavy duty vehicle (HDV) AADT changes by 200 or more;**
- **Daily average speed change by 10 kph or more;**
- **Peak hour speed change by 20 kph or more;**
- **A change in road alignment by 5m or greater**. [amended text]

Traffic data for the proposed development was provided by BMCE to inform the climate impact assessment. Full details are included in Chapter 13 of this EIAR 'Material Assets Traffic & Transportation. There is 1 no. road link that will experience a change of over ~~10% in~~ [amended text] **1000** [amended text] AADT during the operational phase of the development – Grange Castle West Access Road. To provide for a worst-case assessment and to assess potential cumulative impacts, the traffic data has included specific cumulative developments within the area (see Traffic and Transport Assessment and Chapter 13 for further details).

PE-ENV-01104 (TII, 2022c) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022b) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO_2e for the Base Year 2023, Opening Year 2026 and Design Year 2040. Both the Do Nothing and Do Something scenarios are quantified to determine the degree of change in emissions as a result of the proposed development.

The traffic data is detailed in Table 10.5. Only road links that met the ~~DRMB~~ [amended text] TII [amended text] scoping criteria were included in the modelling assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location. See Chapter 9 Air Quality and Chapter 13 Material Assets – Traffic & Transportation for further details on the traffic data.

Road Name	Speed (kph)	Base Year 2023	Opening Year 2026		Design Year 2040	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Grange Castle West Access	50	0 (0)	0 (0)	1,030 (30)	0 (0)	1,030 (30)

Table 10.5: Traffic Data used in Operational Phase Assessment

Operational Energy Use

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. A Sustainability and Energy Statement TGD L Compliance Report has been prepared by Homan O'Brien in relation to the proposed development and is submitted separately with this planning application. The report outlines a number of measures which have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible. Information on some of the measures in relation to operational energy usage and sustainability measures has been supplied to inform the climate assessment.

10.3 Receiving Environment

PE-ENV-01104 (TII, 2022c) states that a baseline climate scenario should identify GHG emissions without the project for both the current and future baseline, consistent with the study area for the project.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

10.3.1 Greenhouse Gas Emissions

~~Data published in July 2023 (EPA, 2023) predicts that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.72 Mt CO_2e. When the available flexibilities are taken into account, the limit is exceeded by 1 Mt CO_2e. The sectoral breakdown of 2021 GHG emissions is shown in Table 10.6. The sector with the highest emissions in 2022 was agriculture at 38.4% of the total, followed by transport at 19.1%. For 2022 total national emissions (excluding LULUCF) were estimated to be 60.76 Mt CO_2e as shown in Table 10.6 (EPA, 2023).~~

[amended text] **Data published in July 2024 (EPA, 2024) indicates that Ireland exceeded, without the use of flexibilities, its 2023 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 2.27 Mt CO_2e. However, the 2023 emissions were the first time that Irelands emission were below (-1.2%) 1990 levels. ETS emissions decreased (-17.0%) and ESR emissions decreased (-3.4%). Ireland's target is an emission reduction of 626 kt of CO_2e by 2030 on an average baseline of 2016 to 2018. The EPA estimate that 2023 total national GHG emissions, excluding LULUCF, have decreased by 6.8% on 2022 levels to 55.01 Mt CO_2e, with a 2.2 Mt CO_2e (-21.6%) reduction in electricity industries alone. This was driven by a**

40.7% share of energy from renewables in 2023 and increasing our imported electricity. Manufacturing combustion and industrial processes decreased by 5.1% to 6.3 Mt CO_2e in 2023 due to declines in fossil fuel usage. The sector with the highest emissions in 2023 was agriculture at 37.6% of the total, followed by transport at 21.4%. For 2023, total national emissions (including LULUCF) were 60.62 Mt CO_2e (EPA, 2024), as shown in Table 10.6.

The provisional 2023 figures indicate that Ireland has used 63.9% of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025.

Sector *Note 1*	2021	2022	2023	Total Budget (Mt CO_2e) (2021-2025)	% Budget 2021-2025 Used	Annual Change 2022 to 2023
Electricity	9.893	9.694	7.558	40.0	67.9%	-22.0%
Transport	11.089	11.760	11.791	54.0	64.1%	0.3%
Buildings (Residential)	6.868	5.753	5.346	29.0	62.0%	-7.1%
Buildings (Commercial and Public)	1.444	1.447	1.409	7.0	61.4%	-2.6%
Industry	7.093	6.622	6.288	30.0	66.7%	-5.0%
Agriculture	21.940	21.795	20.782	106.0	60.9%	-4.6%
Other *Note 2*	1.864	1.931	1.832	9.0	62.5%	-5.1%
LULUCF	4.628	3.983	5.614	-	-	40.9%
Total including LULUCF	**64.819**	**62.986**	**60.620**	**295.0**	**63.9%**	**-3.8%**

Note 1 Reproduced from latest emissions data on the EPA website July 2024 (EPA, 2024).
Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

Table 10.6: Trends in Total National GHG Emissions 2021 - 2023
[amended text]

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022c) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP24, and future CAPs, alongside binding 2030 EU targets. The European Union (EU) enacted '*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*' (hereafter referred to as the Regulation) to meet the commitments under the Paris Agreement (European Union, 2018).

The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

Sector	2022 Emissions (Mt CO_2e)	% Total 2022 (including LULUCF)
Agriculture	23.337	34%
Transport	11.634	17%
Energy Industries	10.076	15%
Residential	6.105	9%
Manufacturing Combustion	4.288	6%
Industrial Processes	2.289	3%
F-Gases	0.741	1%
Commercial Services	0.767	1%
Public Services	0.659	1%
Waste[Note 2]	0.867	1%
LULUFC	7.305	11%
National total excluding LULUFC	**60.764**	**89%**
National total including LULUFC	**68.069**	**100%**

Note 1: Reproduced from Latest emissions data on the EPA website (EPA 2023)
Note 2: Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste

Table 10.: Total National GHG Emissions in 2022

10.3.2 Climate Change Vulnerability

Impacts due to climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, and small increases or decreases in the south and east, including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts due to climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020c) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25 per cent by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020c) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In

addition, heat events are expected to increase by mid-century (EPA, 2020c). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020c).

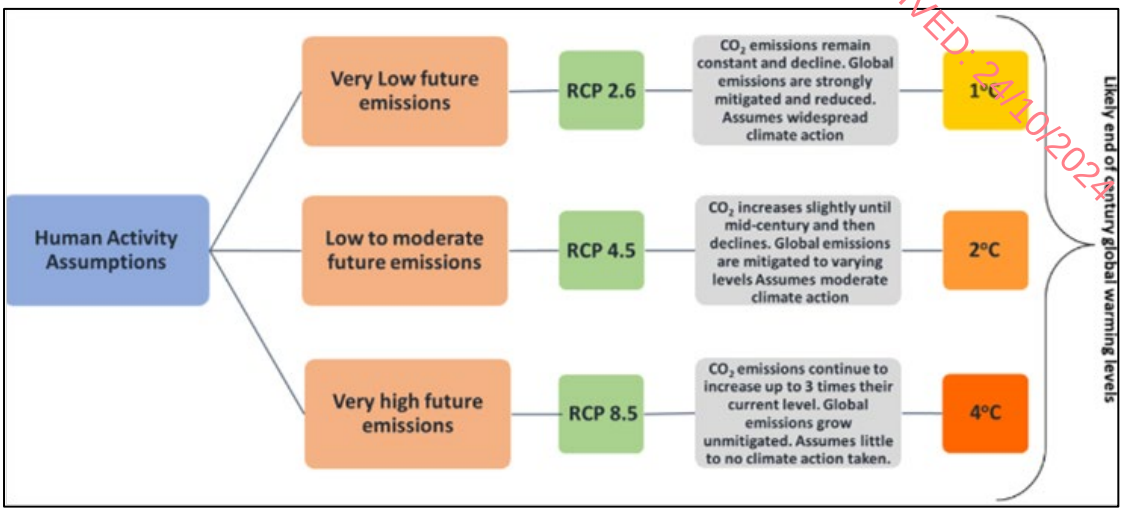
TII's Guidance document PE-ENV-01104 (TII, 2022c) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in 'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020d). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

In relation to the proposed development predictive climate modelling available from the Climate Ireland website (2023) indicates that the area of Grangecastle is likely to experience increased temperatures in future years with an increase in the number of heatwave days. Overall this will also result in a reduction in the amount of rainfall however there is predicted to be increases in the number of wet days (days with rainfall greater than 20mm). Wind speeds are predicted to decrease in future years however there will be an increase in extreme winds and storm events for the area of the proposed development. These future climate conditions have been considered when determining the vulnerability of the proposed development to climate change (see Section 10.5.3).

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures

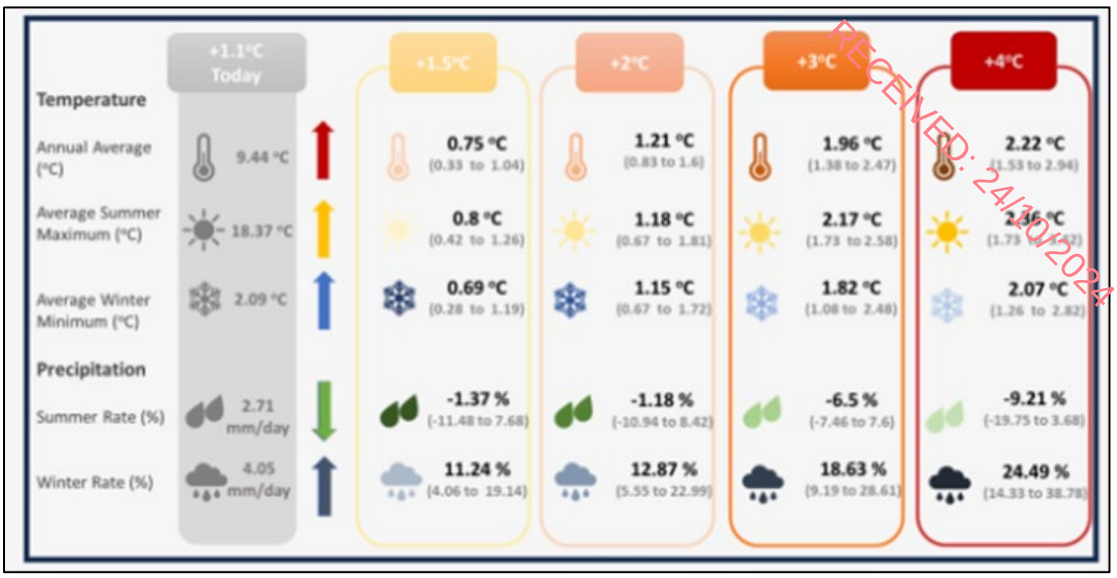
based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 10.1.



Source: TRANSLATE project storymap (Met Éireann 2023)

Figure 10.1: Representative Concentration Pathways associated emission levels

TRANSLATE (Met Éireann, 2023) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C. Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SST)s (Met Éireann, 2023). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (see Figure 10.2). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.



Source: TRANSLATE project storymap (Met Éireann, 2023)

Figure 10.2: Change of climate variables for Ireland for different Global warming thresholds

10.4 Characteristics of the Proposed Development

The proposed development comprises a Media Park at lands west of Grange Castle Business Park, Dublin 22. A full description of the development is available in Chapter 3.

In relation to climate, impacts will occur during both the construction and operational phases of the development. During the construction stage the main source of climate impacts will be because of GHG emissions and embodied carbon associated with the proposed construction materials and activities for the proposed development.

During the operational phase vehicle emissions from traffic accessing the site has the potential to release CO_2 and other GHGs which will impact climate. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

10.5 Potential Impacts of the Proposed Development

10.5.1 Do Nothing Scenario

In the Do Nothing Scenario no construction works will take place and the site will remain as it currently is. The climate baseline will continue to develop in line with the identified trends (see Section 10.3). This scenario is considered neutral in relation to climate.

10.5.2 Construction Phase

Greenhouse Gas Assessment

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development.

Embodied carbon is carbon dioxide emitted during the manufacture, transport and construction of building materials, together with site activities. The most significant proportion of carbon emissions tend to occur during the construction phase because of

embodied carbon in construction materials and emissions from construction activities. Therefore, the assessment has included the construction phase embodied carbon for the purposes of the EIAR. The assessment is broken down into the following stages as per Section 10.2.2:

- Product stage (A1 – A3)
- Transportation to site (A4)
- Site operations (A5)
- Material replacement & refurbishment (B4 – B5)

The construction phase embodied carbon emissions comprise stages A1 – A5 include the construction materials, the transport of the materials to site and the construction activities or site operations. Ongoing material refurbishment and replacement throughout the lifetime of the development is included within category B4 – B5, these are default values based on the typical maintenance requirements for the chosen material types over the assumed 50 year lifetime. Figure 10.3 shows the embodied carbon for the proposed development per life-cycle stage.

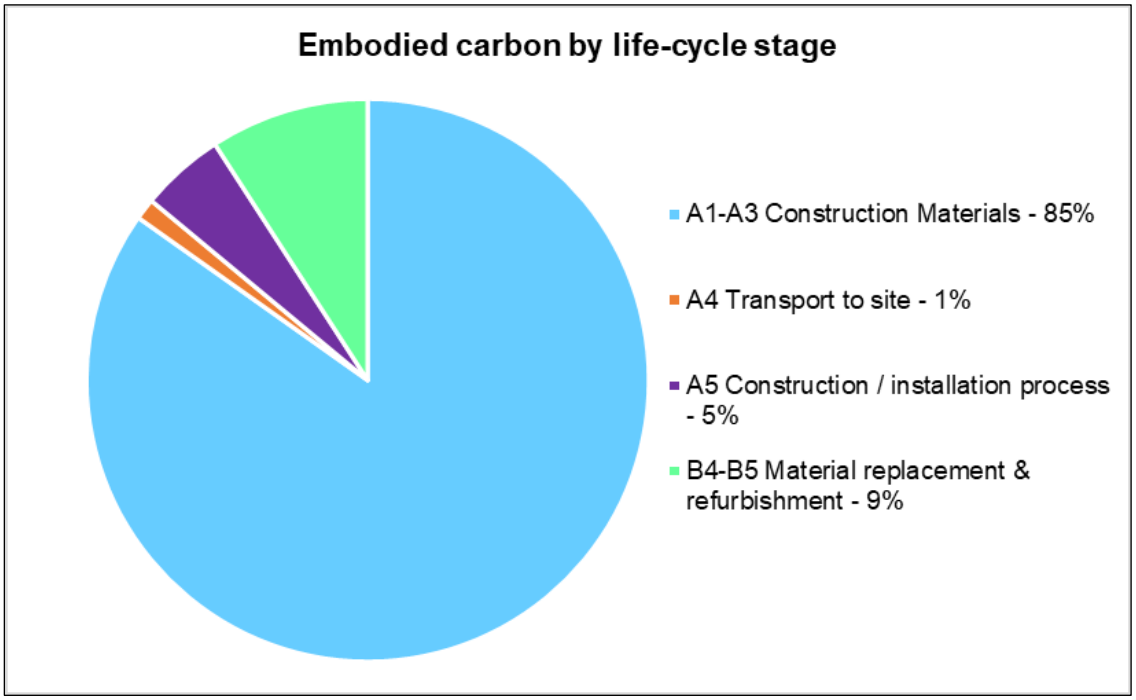


Figure 10.3: Embodied Carbon by Life-Cycle Stage

Construction materials make up the majority of carbon emissions for the proposed development making up c.85% of the total construction phase embodied carbon emissions across the different buildings. The beams, floors and roofs are the areas with the highest carbon impact, based on the general assumptions made for the carbon calculations which include default material types and quantities based on the overall floor area of the buildings and the building types. Transportation to site, site operations and material replacement make up the remainder of the construction embodied carbon emissions.

It has been calculated that the total construction phase embodied carbon (including maintenance and replacement of materials over the development lifetime) will be 33,493 tonnes CO_2e. When this is annualised over the assumed 50 year lifespan of the development this equates to 0.017% of the Industry sector 2030 carbon budget of 4 Mt CO_2e or 0.067% of the Commercial Buildings 2030 carbon budget of 1 Mt CO_2e. Annualising the full carbon

emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets. The impact to climate is predicted to be moderate, negative and not significant.

The carbon assessment has highlighted the areas where the highest embodied carbon emissions occur, specifically as a result of building materials. The carbon emissions have been calculated based on standard default materials for the various building types based on the overall floor area of the buildings and the building types, within the OneClick tool as detailed material information is not available at this stage in the project. There is the potential to reduce carbon emissions through the use of alternative materials with lower embodied carbon emissions such as timber frame walls or concrete with a 50% recycled cement content for example.

Climate Change Risk Assessment

Examples of potential climate impacts are included in Annex D (Climate proofing and environmental impact assessment) of the Technical Guidance on the Climate Proofing of Infrastructure (European Commission, 2021a). Potential impacts to the proposed development as a result climate change include:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

Each of these potential risks are considered with respect to the operational phase of the proposed development as detailed in Section 10.5.3. During the construction phase no assessment is required; however, consideration will be given to the project's vulnerability to climate impacts. 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.

10.5.3 Operational Phase

Greenhouse Gas Assessment

Ongoing maintenance of the proposed development materials has been accounted for within the construction phase assessment in Section 10.5.2. The following sections outline the impact of operational energy use and traffic emissions on GHG emissions.

Operational Energy Usage

The proposed development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. These are outlined fully within the Sustainability and Energy Statement TGD L Compliance Report prepared by Homan O'Brien in relation to the development. The report focusses on the office buildings, restaurant and administration building as these are covered under the Part L Technical Guidance Document (TGD L). The primary elements with respect to reducing climate impacts and optimising energy usage are summarised below.

The development will be a Nearly Zero Energy Building (NZEB) in accordance with the 2022 Part L requirements. The units will have an energy performance coefficient (EPC) that complies with NZEB (maximum permitted under NZEB requirements is <1.00). The units will also have a carbon performance coefficient (CPC) and renewable energy ratio (RER) that comply with NZEB requirements (maximum permitted CPC under NZEB requirements is <1.15 and RER is 0.20). The following items will assist in achieving the NZEB compliance:

- Energy efficient LED lighting will be utilised
- Air source heat pump technology will be installed
- A PV solar array will be included to produce 1300kW peak power
- Limiting heat loss and heat gains

In addition to energy efficiency, it is also proposed to utilise methods to reduce water consumption and conserve water. This is important in terms of reducing energy use as well as providing adaptation to climate change vulnerability in the future and the potential for increased dry spells or drought periods. A rainwater collection and harvesting system is proposed as part of the development which will be used for flushing of toilets within the buildings. Additionally, low water consumption sanitary appliances will be installed. An efficient leak detection system will be included, the system will cover all mains water supply pipework between the building and the site boundary and will be capable of detecting major leaks that may otherwise go undetected. A water meter will also be installed which will be linked to the Building Management System and will be capable of identify water usage outside of the predicted norms.

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.

Climate and Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. To provide for a worst-case assessment and to assess potential cumulative impacts, the traffic data has included specific cumulative developments within the area (see Traffic & Transport Assessment for further details).

The predicted concentrations of CO_2e for the future years of 2026 and 2040 are detailed in Table 10.7. These are significantly less than Ireland's national 2026 and 2030 targets set out under EU legislation (targets beyond 2030 are not available) and the 2030 sectoral emissions ceilings. It is predicted that in 2026 the proposed development will increase CO_2 emissions by 19 tonnes CO_2e.This equates to 0.00005% of the 2026 national emission ceiling or 0.00032% of the 2030 Transport sector emissions ceiling (see Table 10.2). Similarly low increases in CO_2

emissions are predicted to occur in 2040 with emissions increasing by 15 tonnes CO_2e. This equates to 0.00004% of the 2030 national emission ceiling or 0.00024% of the 2030 Transport sector emissions ceiling (see Table 10.2). This will result in a long-term, minor adverse and not significant impact to climate.

In addition, electric vehicle parking and charging infrastructure will be provided as part of the parking requirements at the proposed development which will promote the use of more sustainable methods of transport.

Year	Scenario	CO_2e (tonnes/annum)
2026	Do Nothing	0
	Do Something	19
2040	Do Nothing	0
	Do Something	15
Increment Change in 2026		19
National Emission Ceiling 2026 (Tonnes) Note 1		**37,869,352**
Impact in 2026 (as % of national emissions ceiling)		0.00005%
Transport Sector 2030 Emission Ceiling		**6,000,000**
Impact in 2026 (as % of transport sector emissions ceiling)		0.00032%
Increment Change in 2040		15
National Emission Ceiling 2030 (Tonnes) Note 1		**33,381,312**
Impact in 2040 (as % of national emissions ceiling)		0.00004%
Impact in 2040 (as % of transport sector emissions ceiling)		0.00024%

Note 1 Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council

Table 10.7: Traffic Emissions GHG Impact Assessment

Climate Change Risk Assessment

To determine the vulnerability of the proposed development to climate change, the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning, hail, landslides and fog.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. Table 10.8 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 10.4. The results of the vulnerability assessment are detailed in Table 10.8 below.

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (coastal, pluvial, fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)

Climate Hazard	Sensitivity	Exposure	Vulnerability
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)

Table 10.8: Climate Change Vulnerability Assessment

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

Flooding
A flood risk assessment was conducted by BMCE as part of the planning application. It identified that flooding is not a risk at the proposed development location. Additionally, the drainage for the development has been designed with an additional 20% to allow for increased rainfall in future years due to climate change. This is in line with the "Medium Risk" RCP4.5 scenario and the requirements of South Dublin County Council. An additional 30% would align with the "High Risk" RCP8.5 scenario, therefore, the exposure has been classified as medium, however the resulting vulnerability remains low.

Extreme Wind, Fog, Lightning & Hail
In relation to extreme winds, the appropriate wind loadings are to be calculated in line with the relevant building requirements. Lightning protection will be provided for the buildings and designed by a specialist. Hail and fog are not predicted to significantly affect the buildings due to their design.

Wildfires
In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) (2023), indicates that the wildfire hazard is classified as low for the Dublin area. This means that there is between a 4% to 10% chance of experiencing weather that could support a problematic wildfire in the project area that may cause disruptions and low but tangible risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. However, due to the project location in a suburban area the risk of wildfire is significantly lessened and it can be concluded that the proposed development is of low vulnerability to wildfires.

Landslides
Landslide susceptibility mapping developed by GSI indicates that the proposed development location is not within an area that is susceptible to landslides and there are no recorded historical landslide events at the project location. It can be concluded that landslides are not a risk to the proposed development site.

Extreme Temperatures (Heat & Cold)
At the detailed design stage chosen building materials will be high quality, durable and hard-wearing and chosen to withstand increased variations in temperature in the future because of climate change.

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards and therefore no detailed risk assessment is required.

10.6 Mitigation Measures

10.6.1 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:

- 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.
- Waste materials will be re-used on site where possible and where re-use is not possible on-site they will be sent off-site for recycling, re-use or recovery.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

In addition to the above best practice measures, the carbon assessment has highlighted the areas where the highest embodied carbon emissions occur, specifically due to building materials (see Section 10.5.2). To reduce carbon impacts from the proposed development, using alternative materials with lower embodied carbon emissions, such as timber frame walls or concrete with a 50% recycled cement content, can reduce the impact of the development on climate.

Alternative material types with lower embodied carbon should be investigated during the detailed design phase of the proposed development.

10.6.2 Operational Phase

A number of measures have been incorporated into the 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 change (see Section 10.5.3).

A number of design mitigation measures have been integrated into the development's design to reduce the impact on climate. Full details of these measures are outlined within the Sustainability and Energy Statement TGD L Compliance Report prepared by Homan O'Brien in relation to the development. Details are provided in Section 10.5.3 and include compliance with the NZEB regulations. These measures will aid in reducing the impact of the development on climate during the operational phase.

10.7 Monitoring

10.7.1 Construction Phase

No monitoring is required for the construction phase of the proposed development.

10.7.2 Operational Phase

No monitoring is required for the operational phase of the proposed development.

10.8 Residual Impacts

The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". The proposed development incorporates some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in Table 10.3 the impact of the proposed development in relation to GHG emissions is considered ***long-term, moderate, negative*** and ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change.

10.9 Cumulative Impacts

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022a) states that "*for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable*."

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

10.10 Interactions

10.10.1 Climate and Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels associated with vehicles and machinery during the construction and operational phases. The emissions generate both air quality and climate impacts. There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

10.10.2 Climate and Hydrology

<u>Construction Phase</u>
There are no potentially significant interactions identified between climate, and hydrology during the construction phase.

<u>Operational Phase</u>
Climate change has the potential to increase the risk of flooding in future years due to increased rainfall. The hydrology assessment has concluded that no residual risk is foreseen as the development is located primarily outside any flooding zone designations. The proposed development has been assessed as having a low vulnerability to climate change related flooding. The impact will be neutral.

10.10.3 Climate and Material Assets, including Utilities, Waste Management, and Transport

Construction Phase

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO_2, a greenhouse gas. However, the change in traffic is not predicted to be significant. There are no potentially significant interactions identified between climate and traffic.

Waste management measures will be put in place during the construction phase to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The impact to climate as a result of embodied carbon in waste materials is not considered significant.

Operational Phase

During operation traffic emissions have the potential to emit GHGs, such as CO_2, which impact climate. The change in traffic because of the proposed development has been assessed and the impact is predicted to be insignificant. There are no potentially significant interactions identified between climate and traffic.

10.11 References

BSI (2016) Publicly Available Specification (PAS) 2080:2016 on Carbon Management in Infrastructure

Civil Engineering Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database.

Climate Ireland Website (2023) Available at: https://www.climateireland.ie/#!/tools/climateDataExplorer

Department of the Taoiseach (2022) Carbon Budgets Available at https://www.gov.ie/en/publication/9af1b-carbon-budgets/

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

Environmental Protection Agency (EPA) (2020a) Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach.

Environmental Protection Agency (2020b) State of the Irish Environment Report (chapter 2: climate change)

Environmental Protection Agency (EPA) (2021a) What impact will climate change have for Ireland? [Online] Available at https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/

Environmental Protection Agency (EPA) (2021b) Critical Infrastructure Vulnerability to Climate Change Report no. 369

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

~~Environmental Protection Agency (EPA) (2023) Ireland's Greenhouse Gas Emissions 1990-2022~~
[amended text] **Environmental Protection Agency (EPA) (2024) Ireland's Greenhouse Gas Emissions 1990-2023** [amended text]

European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment

European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report

European Commission (2021a) Technical guidance on the climate proofing of infrastructure in the period 2021-2027.

European Commission (2021b) Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2020) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021)

Government of Ireland (2022) Climate Action Plan 2023

Government of Ireland (2023) Climate Action Plan 2024

Institute of Environmental Management & Assessment (IEMA) (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Institute of Environmental Management & Assessment (IEMA) (2020a) EIA Guide to: Climate Change Resilience and Adaptation.

Institute of Environmental Management & Assessment (IEMA) (2020b) GHG Management Hierarchy. Assessing Greenhouse Gas Emissions and Evaluating their Significance

Institute of Environmental Management & Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Met Eireann (2023) Met Eireann website: https://www.met.ie/

One Click LCA Ltd. (2023) Carbon Designer for Ireland Tool

Transport Infrastructure Ireland (TII) (TII 2021) Sustainability Implementation Plan – Our Future

Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (TII) (2022b) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

~~UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate~~
[amended text] **Transport Infrastructure Ireland (2022c) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106** [amended text]

11.0 NOISE AND VIBRATION

11.1 Introduction

This chapter assesses the potential noise and vibration impact of the proposed development at the Grangecastle Media Park. The assessment of impacts has been undertaken in the context of current relevant standards and guidance and identifies any requirements or possibilities for mitigation. A full description of the development can be found in Chapter 3 (Description of Development).

11.1.1 Statement of Authority

This chapter of the EIAR has been prepared by the following consultants:

Aoife Kelly (Senior Acoustic Consultant) holds a BSc(Hons) in Environmental Health and a PhD in Occupational Noise. She has completed the Institute of Acoustics Diploma in Acoustics and Noise Control and won the 2016 Association of Noise Consultants (ANC) best diploma project for speech intelligibility in schools. Working in the area of acoustics since 2013, she has extensive experience in occupational noise surveying and environmental acoustics.

Finnian Hurley (Acoustic Consultant) has a BA(Hons) in Music as well as an M.Phil in Music & Media Technology from Trinity College Dublin. He has a background in audio engineering, ambisonics, and VR related technology. He has experience in environmental noise surveying, modelling and building acoustics.

11.1.2 Fundamentals of Acoustics

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. To take account of the enormous range of pressure levels that can be detected by the ear, it is widely accepted that sound levels are measured and expressed using a decibel scale i.e. a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels (SPL) is from 0 dB (for the threshold of hearing) to 120 dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10 dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3 dB.

The frequency of sound is the rate at which a sound wave oscillates and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. The 'A-weighting' system defined in the international standard, BS ISO 226:2003 Acoustics. Normal Equal-loudness Level Contours has been found to provide the best correlations with human response to perceived loudness. SPLs measured using 'A-weighting'

are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 11.1.

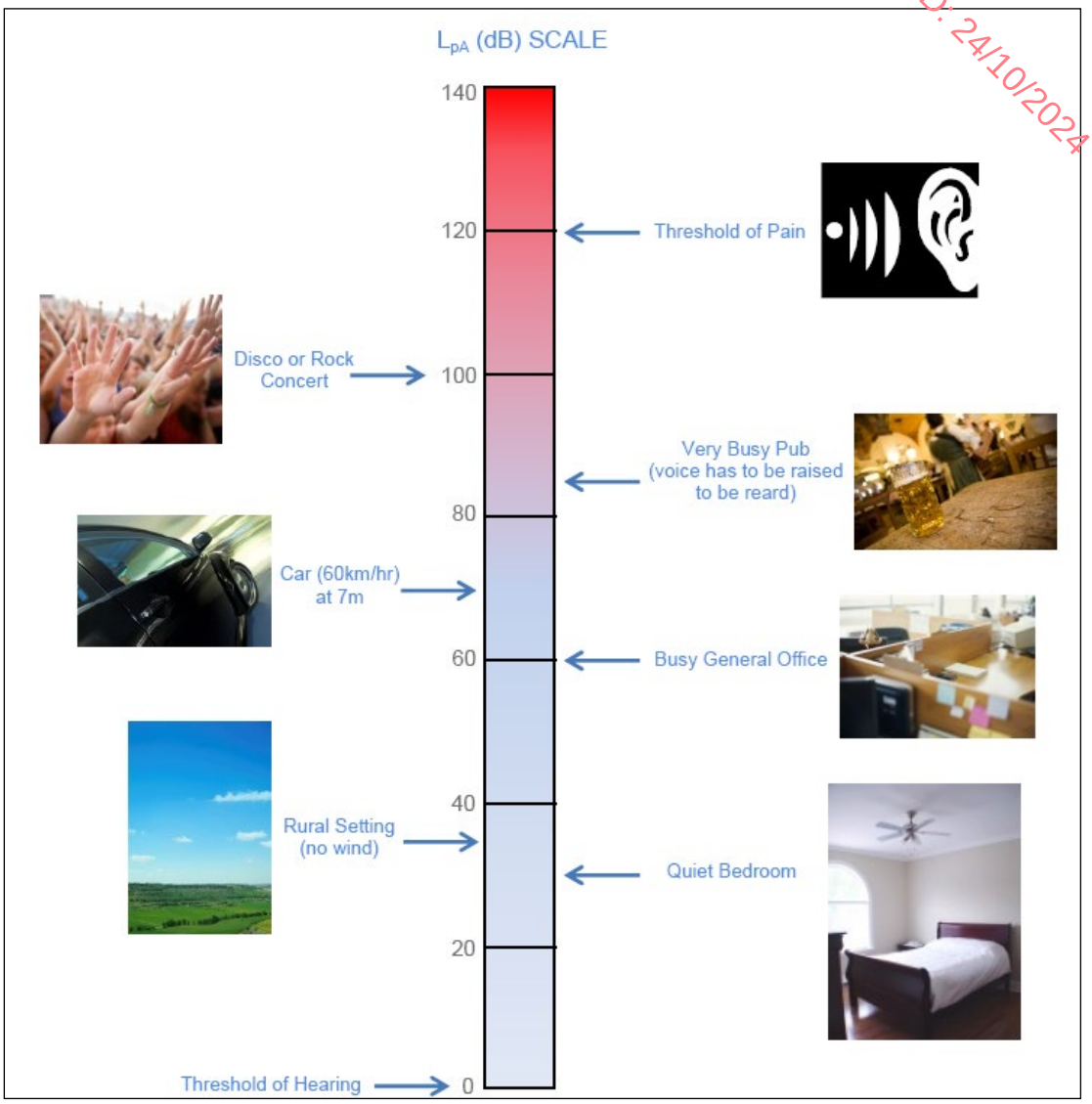


Figure 11.1: dB(A) Scale & Indicative Noise Levels – (Environmental Protection Agency (EPA): Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016)

11.1.3 Description of the Subject Site

The area of the proposed development is 22.6 ha and is located within the administrative jurisdiction of South Dublin County Council (SDCC). It is located west of the Grange Castle Business Park approximately 10km west of Dublin City Centre. It is a greenfield site which is currently used for agriculture. The site is bound to the east and south by agricultural lands, to the west by Grange Castle Business Park, and to the north by the Grand Canal. The site location is indicated in Figure 11.2. A full description of the proposed development is included in Chapter 3.

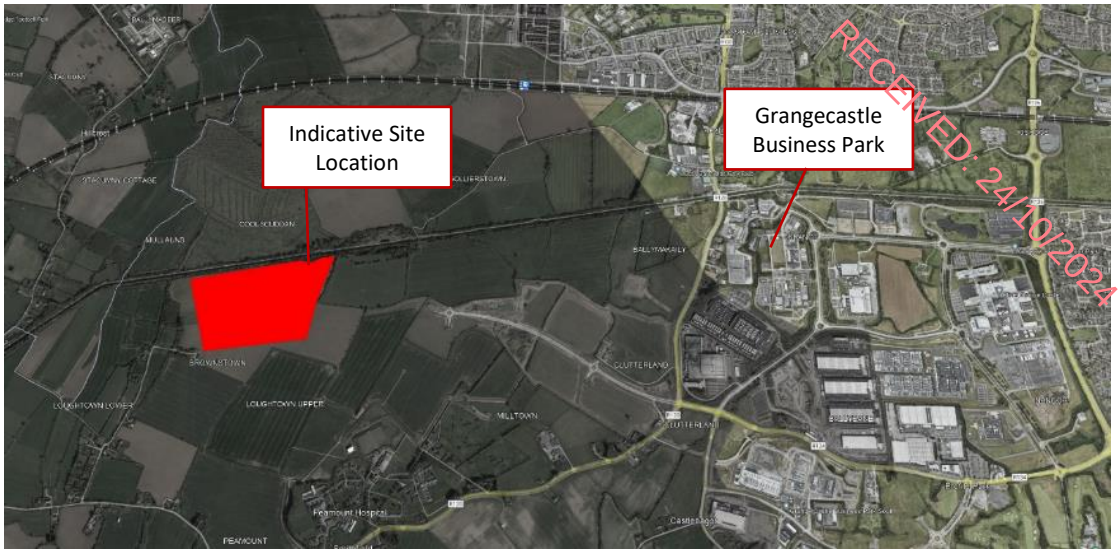


Figure 11-2: Site location

11.2 Methodology

The following methodology has been prepared based on the requirements of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022), EPA Advice Notes on current practise in the preparation of Environmental Impact Statements (EPA, 2003) and on AWN's experience of preparing the noise and vibration chapters for similar developments. The following approach has been used for this assessment:

- Baseline noise monitoring undertaken in the vicinity of the development site has been reviewed and a desk-top assessment of the expected baseline noise environment has been carried out based on available noise mapping and historical surveys in the wider area, in order to characterise the receiving noise environment;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development, this is summarised in the following sections;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phases of the project at the nearest sensitive locations (NSLs) to the site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site;
- Assessment of potential cumulative impacts that may arise as a result of the proposed development, and;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.

11.3 Assessment Criteria

The following sections review best practice guidance that is commonly adopted in relation to developments such as the one under consideration here.

11.3.1 Construction Phase - Noise

BS 5228-1:2009+a1:2014 ABC Method

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise.

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities.

This document sets out guidance on permissible noise levels relative to the existing noise environment. Table 11.1 sets out the values which, when exceeded, signify a potential significant effect at the facades of residential receptors as recommended by BS 5228 – 1. These are cumulative levels, i.e. the sum of both ambient and construction noise levels.

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A[1]	Category B[2]	Category C Note C[3]
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends[4]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Table 11-1: Example Threshold of Potential Significant Effect at Dwellings

It should be noted that this assessment method is only valid for residential properties and if applied to commercial premises without consideration of other factors may result in an excessively onerous thresholds being set.

[1] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
[2] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
[3] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
[4] 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

Fixed Limits

BS 5228-1:2009+A1:2014 gives several examples of acceptable limits for construction or demolition noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states: -

> *"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."*

Paragraph E.2 goes on to state: -

> *"Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed: -*
>
> *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;*
>
> *75 decibels (dBA) in urban areas near main roads in heavy industrial areas".*

Proposed Threshold Levels for Noise

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 11.4), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development: -

- For residential NSLs it is considered appropriate to adopt 65 dB (A) CNT for the day-time period. Given the baseline monitoring carried out, it would indicate that Category A values are appropriate using the ABC method.
- For non-residential NSLs it is considered appropriate to adopt the 70 dB(A) CNT, given the mixed residential and industrial environment in which the proposed development site resides, in line with BS 5228-1:2009+A1:2014 Annex E2.

In order to assist with interpretation of significance, Table 11-2 includes guidance as to the likely magnitude of noise impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of *Design Manual for Roads and Bridges (DMRB), LA111 Noise and Vibration: Highways England, Transport Scotland, The Welsh Government and The Department of Infrastructure, May 2020* (DMRB 2020) and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2022) using professional expertise and judgment.

In accordance with the DMRB Noise and Vibration (UKHA 2020), construction noise and construction traffic noise impacts shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights; and
- A total number of days exceeding 40 in any six consecutive months.

Location	DMRB Magnitude of Impact	EPA Mapped Impacts	Determination
Below or equal to baseline noise level	Negligible	Not Significant	Depending on CNT, duration & baseline noise level
Above baseline noise level and below or equal to CNT	Minor	Slight to Moderate [5]	
Above CNT and below or equal to CNT +5dB	Moderate	Moderate to Significant	
Above CNT +5 and below or equal to CNT +15dB	Major	Significant, to Very Significant	
Above +15dB		Very Significant to Profound [6]	

Table 11-2: Construction Noise Significance Ratings

The adapted DMRB Noise and Vibration (UKHA 2020) guidance is used to assess the overall significance of construction noise at NSLs across the proposed Project.

11.3.2 Construction Vehicular Traffic

In the absence of specific Irish guidelines on noise associated with additional vehicular traffic on public roads it is considered common practice to utilise the UK Highways Agency (UKHA) DMRB Noise and Vibration, which offers guidance as to the likely impact in the short-term associated with any change in traffic noise level. Table 11-3 below presents a summary of Section 3.54 and 3.58 taken from DMRB, which offers guidance as to the likely impact in the short-term associated with any change in traffic noise level.

Change in Sound Level (dB L_{A10})	Magnitude of Impact	Significance
Less than 1.0	Negligible	Not significant
1-2.9	Minor	Not significant
3 – 4.9	Moderate	Significant
5+	Major	Significant

Table 11-3: Likely impacts with a change in traffic noise levels – operational phase

[5] CNLs at the upper end of this range will result in higher potential impacts, therefore this range is categorised as slight to moderate, acknowledging that values approaching the CNT are greater than slight. In accordance with DMRB, noise levels below the CNT are deemed 'Not Significant.'

[6] The DMRB does not distinguish beyond a 'Major' impact. For the purposes of distinguishing between a Very Significant and Profound Impact, CNLs exceeding the CNT by +15 dB are categorised as Profound.

The DMRB guidance outlined above will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely impacts.

11.3.3 Construction Phase – Vibration

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings; and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 7385-2:1993 Evaluation and Measurement for Vibration In Buildings - Guide to Damage Levels from Ground Borne Vibration, and;
- British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Vibration.

As shown in Table 11-4 BS7385:1993 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50 % or less for more critical buildings.

BS5228-1:2009+A1:2014 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50 %. BS 5228-2:2009+A1:2014 also comments that important buildings which are difficult to repair might require special consideration on a case by case basis.

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Table 11-4: Transient vibration guide values for cosmetic damage

Note 1) Values referred to are at the base of the building.

Note 2) At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

Furthermore, BS 5228-2 and BS 7385-2 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 11-4 and major structural damage can occur at vibration magnitudes greater than four times those in Table 11-4.

Table 11-5 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS 5228 – 2 (BSI 2014b), the DMRB Noise and Vibration (UKHA 2020) and associated EPA significance ratings (EPA 2022).

Criteria	Likely Effect	Significance Rating
≥10 mm/s PPV	Major	Significant to Very Significant
≥1 to <10 mm/s PPV	Moderate	Moderate to Significant
≥0.3 to <1 mm/s PPV	Minor	Not Significant to Slight
≥0.14 to 0.3mm/s PPV	Negligible	Imperceptible to Not Significant
Less than 0.14 mm/s PPV		Imperceptible

Table 11-5: Human response vibration significance ratings

11.3.4 Operational Phase - Noise

The main potential source of outward noise from the proposed development will relate to set construction, external filming activities in the backlot, external plant noise and traffic flows to and from the development site onto the public roads. The relevant guidance documents used to assess potential operational noise and vibration impacts are summarised in the following section.

Due to the nature of filming studios a quiet and controlled internal acoustic environment is essential. In part, this is achieved through the selection of suitable building fabrics with high sound insulation performance. As a result, the internal filming activities within the studios are expected to be contained with the high acoustically performing building envelope of the studios and therefore noise breakout will be insignificant. Therefore, further review of the noise levels from the internal filming activities has been scoped out of this assessment and will not be addressed further in this chapter.

Plant Noise

Once a development of this nature becomes fully operational, a variety of electrical and mechanical plant will be required to service the development. Most of this plant will be capable of generating noise to some degree. Some of this plant will operate 24 hours a day, and hence would be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties would potentially have the greatest impact. Plant contained within plantrooms has the least potential for impact once consideration is given to appropriate design of the space.

The following wording would be considered typically suitable for a planning condition related to operational noise (plant) associated with a development of this nature:

"Noise levels from the proposed development should not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any premises in the neighbourhood or to a person lawfully using any public space. In particular the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in B.S. 4142. Method for rating industrial noise affecting mixed residential and industrial area.

Reason: In order to ensure a satisfactory standard of development, in the interests of residential amenity."

The typical planning condition outlined above related to noise emissions from mechanical plant items makes reference to the British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound. This document is the industry standard method for analysing building services plant noise emissions to residential receptors and is the document used by South Dublin County Council in their standard planning conditions and also in complaint investigations.

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background noise level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

The following definitions as discussed in BS 4142 as summarised below:

"ambient noise level, $L_{Aeq,T}$"	is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
"residual noise level, $L_{Aeq,T}$"	is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"specific noise level, $L_{Aeq,T}$"	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].

"rating level, $L_{Ar,T}$"	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive or irregular components);
"background noise level, $L_{A90,T}$"	is the sound pressure level of the residual noise that is exceeded for 90% of the time period T.

If the rated plant noise level is +10dB or more above the pre-existing background noise level then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Assessment of other noise sources

For other noise sources not related to traffic or building services, appropriate guidance on internal noise levels for dwellings is contained within BS 8233:2014: *Guidance on Sound Insulation and Noise Reduction for Buildings* (BS8233). This British Standard sets out recommended noise limits for indoor ambient noise levels in dwellings as set out in Table 11-6.

Activity	Location	Day (07:00 to 23:00hrs) dB $L_{Aeq,16hr}$	Night (23:00 to 07:00hrs) dB $L_{Aeq,8hr}$
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/ area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,T}$[7]

Table 11-6: Internal Noise Design Range for Residential Buildings (BS 8233:2014).

For the purposes of this study, it is appropriate to derive external limits based on the internal criteria noted in Table 11-6. This is done by factoring in the degree of noise reduction afforded by a partially open window, typical 15dB attenuation is noted in this British Standard. Using this correction value across an open window, the following external noise levels are proposed for other operational noise sources.

- Daytime / Evening (07:00 to 23:00 hours) 50 dB $L_{Aeq,1hr}$
- Night-time (23:00 to 07:00 hours) 45 dB $L_{Aeq,15min}$

[7] The document comments that the internal $L_{AFmax,T}$ noise level may be exceeded no more than 10 times per night without a significant impact occurring.

Assessment of Significance

The 'Guidelines for Environmental Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the proposed development.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 11-7 below is based on an example scale within the IEMA guidelines. The corresponding significance of effect from in the EPA's EIA Report Guidelines (2022) is also presented.

Noise Level Change dB(A)	Subjective Response	Guidelines for Environmental Noise Impact Assessment Significance (IEMA)	Impact Guidelines on the Information to be contained in EIA Report's (EPA)
0	No change	None	Imperceptible
0.1 – 2.9	Barely perceptible	Minor	Not Significant
3.0 – 4.9	Noticeable	Moderate	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Very Significant, Profound

Table 11-7: Operational noise impact scale

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels and have been used to assess the impact of operational noise.

11.3.5 Change in Traffic Noise Levels

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. In this instance, to assist with the interpretation of the noise associated with vehicular traffic on public roads, DMRB Noise and Vibration (UKHA 2020) offers guidance as to the likely impact associated with any particular change in traffic noise level.

Noise Level Change dB(A)	Subjective Response	DMRB Magnitude of Impact (Long-term)	Effect Guidelines on the Information to be contained in EIARs (EPA)
0	No change	No impact	Imperceptible
0.1 – 2.9	Barely perceptible	Negligible	Not significant
3.0 – 4.9	Noticeable	Minor	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Moderate	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Very significant

Table 11-8: Subjective impact associated with change in traffic noise level (DMRB 2020)

11.3.6 Operational Phase – Vibration

Giving consideration to both the distance of the development to the nearby receptor locations, and the types of activities proposed on site there is no expectation that vibration emissions will be perceptible at receptor locations during the operational phase. Consequently, no criterion is proposed.

11.4 Receiving Environment

An environmental noise survey was conducted to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise.*

The noise survey was undertaken at a total of five locations at the site. Two unattended monitoring locations were installed. Attended monitoring was conducted in three survey locations. The selected survey locations were appropriate to determine baseline incident noise at the proposed development and the baseline noise at the nearest noise sensitive locations (NSLs). The selected measurement positions are described in the following sections and indicated in Figure 11-3.

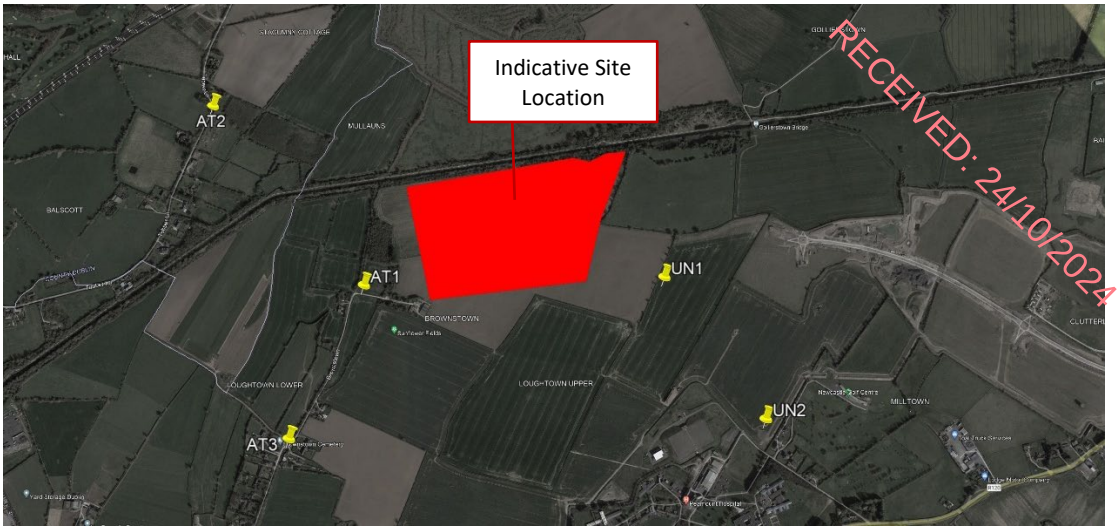


Figure 11-3: Noise Monitoring Locations

Photographs were taken of each installation, and these can be observed in the figures below:

Figure 11-4: UN1 Monitoring Location

Figure 11-5: UN2 Monitoring Location

Figure 11-6: AT1 Monitoring Location

Figure 11-7: AT2 Monitoring Location

Figure 11-8: AT3 Monitoring Location

11.4.1 Survey Periods

At both UN1 and UN2, continuous noise measurements were logged at intervals of 5 minutes between 10:23hrs on the 3 November 2023 and 11:22hrs on 8 November 2023. The full set of tabulated noise monitoring results during this period are contained in Appendix A.

The attended surveys conducted at locations AT1-AT3 were carried out during the afternoons of Friday 3 November 2023 and the 17 November 2023. Three 15-minute measurements were conducted at each location with a rotation between each location once the 15-minute measurement was completed.

AWN staff installed and collected the noise and vibration monitoring equipment. The following instrumentation were used in conducting the noise and vibration surveys.

Equipment	Type	Serial Number	Calibration Date
Sound Calibrator	Brüel & Kjær Type 4231	2263026	January 2023
Sound Level Meter	RION NL-52	575782	September 2023
Sound Level Meter	RION NL-52	1076328	September 2022
Sound Level Meter	RION NL-52	386771	June 2023
Sound Level Meter	RION NL-52	976162	September 2022

Table 11-9: Instrumentation Used

11.4.2 Measurement Parameters

The noise survey results are presented in terms of the following three parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

L_{Amax} is the Maximum sound level that is measured during the sample period.

L_{Amin} is the Minimum sound level that is measured during the sample period.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

11.4.3 Unattended Data Results

The results from both unattended monitors UN1 and UN2 can be observed below:

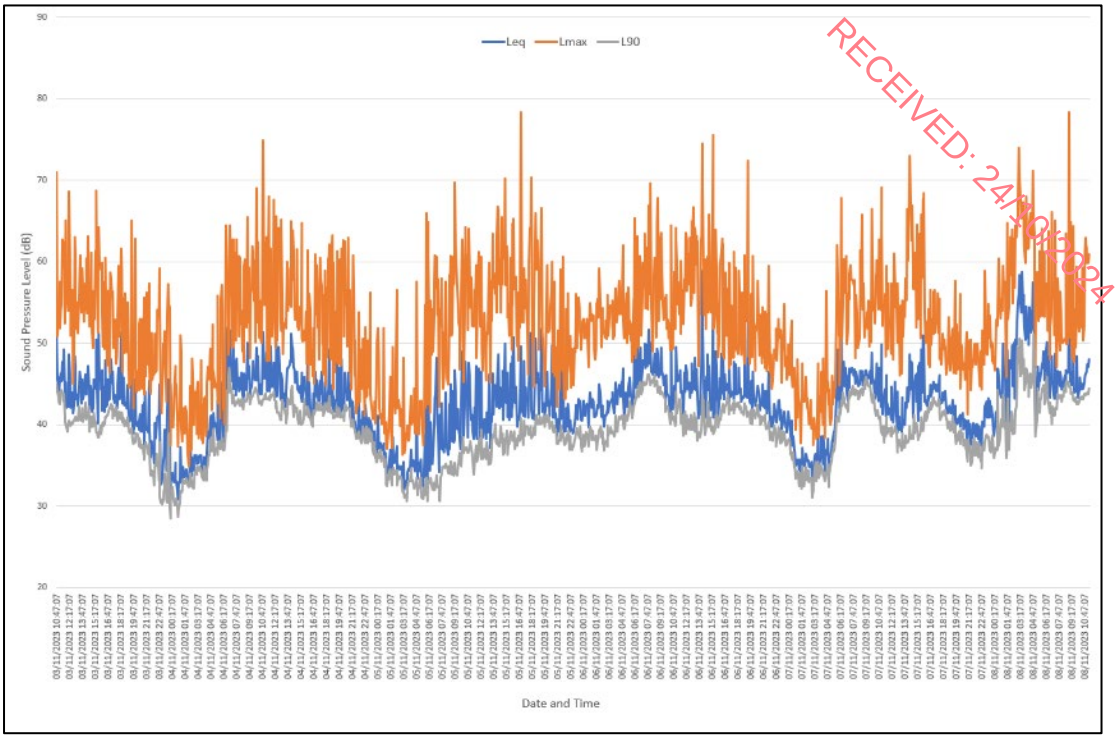


Figure 11-9: UN1 Measurement Data

At UN1, daytime noise levels were in the range between 39 to 57 dB $L_{Aeq,5min}$ and 33 to 45 dB $L_{A90,5min}$.

Night-time noise levels were in the range between 32 to 50 dB $L_{Aeq,5min}$ and 29 to 43 dB $L_{A90,5min}$.

Subjective observations during the setup and removal of the monitoring equipment noted that the primary contributor to noise build-up was distant road traffic noise with audible foliage and birdsong.

There is a period from approximately 02:40hrs and 05:30hrs on the morning of the 8 November where there is a sudden rise in noise during night-time hours, reaching highs of 58 dB $L_{Aeq,5min}$. This is likely due to poor weather conditions that were recorded during this period, and therefore was excluded from the analysis as it was deemed an outlier and not representative of the noise environment.

Table 11-10 summarises the averaged day, evening and night-time noise levels for location UN1.

Day / Date	Sound Pressure Level (dB re. $2x10^{-5}$ Pa)					
	Daytime (07:00 to 19:00 hrs)		Evening (19:00 to 23:00 hrs)		Night (07:00 to 23:00 hrs)	
	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}
Fri, 3 Nov 2023	45	41	40	37	38	32
Sat, 4 Nov 2023	45	42	42	40	37	35
Sun, 5 Nov 2023	42	37	42	39	37	34

Mon, 6 Nov 2023	46	42	43	40	43	40
Tue, 7 Nov 2023	44	41	40	38	39	36
Wed, 8 Nov 2023	46	43	-	-	-	-
Average	**45**[8]	**41**[9]	**41**[1]	**39**[2]	**40**[1]	**35**[2]

Table 11-10: Average Levels During Survey Periods

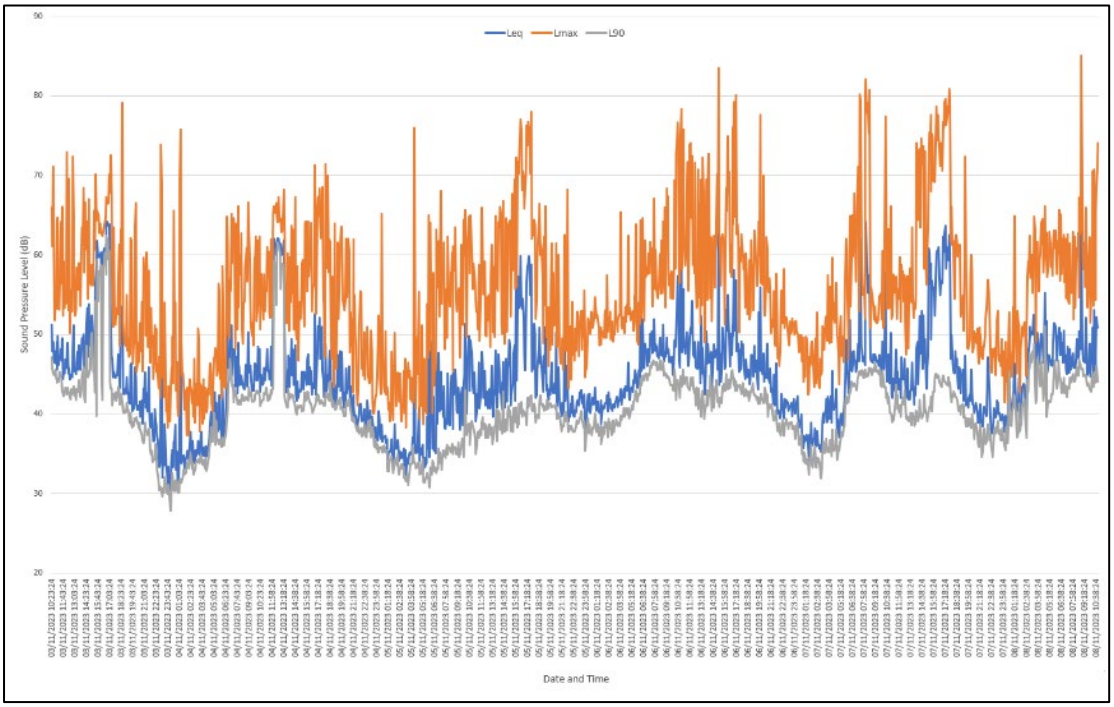


Figure 11-10: UN2 Measurement Data

At UN2, daytime noise levels were in the range between 39 to 64 dB $L_{Aeq,5min}$ and 33 to 46 dB $L_{A90,5min}$. At the time of the installation, notable noise sources included birdsong, light wind in foliage and occasional distant road traffic from nearby estate.

Night-time noise levels were in the range between 32 to 46 dB $L_{Aeq,5min}$ and 28 to 44 dB $L_{A90,5min}$.

There are moments of sudden rises in noise at this location that are likely due to activity in the nearby estate on the weekend such as loud music or garden work. These periods are considered to be outliers and not representative of the noise environment and are excluded from this analysis.

11.4.4 Attended Data Results

A summary of all measured data at the four attended monitoring locations AT1-AT3 can be observed in Table 11-11. Overall, weather conditions were calm and dry during the survey periods.

[8] Logarithmically averaged
[9] Arithmetically averaged

Location	Period	Date	Time	Sound Pressure Level (dB re $2x10^{-5}$ Pa)		
				L_{Aeq}	L_{Amax}	L_{A90}
AT1	Day	03/11/2023	11:37-11:42	46	69	40
			13:50-14:05	46	75	40
		17/11/2023	13:55-14:10	43	71	39
	Eve	09/11/2023	21:10-21:25	42	54	38
	Night	10/11/2023	00:42-00:57	41	58	33
		15/11/2023	02:14-02:29	38	59	32
AT2	Day	03/11/2023	12:18-12:33	50	72	42
			14:34-14:49	54	76	44
		17/11/2023	12:45-13:00	52	77	37
	Eve	09/11/2023	21:40-21:55	46	66	39
	Night	15/11/2023	00:16-00:31	46	59	39
			01:42-01:57	39	58	35
AT3	Day	03/11/2023	11:53-12:08	45	63	40
			14:08-14:23	46	58	43
		17/11/2023	14:14-14:31	59	78	40
	Eve	09/11/2023	20:45-21:00	42	69	37
	Night	10/11/2023	00:20-00:35	34	53	30
		15/11/2023	01:14-01:29	42	74	34

Table 11-11: Attended Measurement Data

During the daytime, noise sources at each of the locations include birdsong, pedestrian activities, aircraft flying overhead, and distant road traffic noise. Occasional cars passing at AT2 and AT3 were listed as dominant sources at these locations. The final daytime survey period on the 17th of November sees a rise in L_{Aeq} and L_{Amax} due to busy outdoor activities in the nearby properties, as well as large vehicles passing on the nearby roads. During evening and night time periods the above mentioned sources were less frequent and a quieter noise environment was noted. Site noise from the Grangecastle Business Park was not audible at any location.

11.4.5 Baseline Summary

When setting the construction noise thresholds. Baseline monitoring carried out as part of this assessment would indicate that the residential NSLs when shielded from road traffic noise sources are in Category A e.g. daytime Construction Noise Threshold 65 dB $L_{Aeq,\ 1\ hour}$.

The attended night-time ambient noise levels typically range between 34 to 46 dB $L_{Aeq,}$ and the background noise levels range between 30 to 39 dB $L_{A90,15min}$. Further assessment of the unattended noise monitoring equipment on the proposed site (UN1) indicates that the background noise environment is on average 41 dB L_{A90} during the daytime, 39 dB L_{A90} during the evening and 35 dB L_{A90} at night-time.

11.5 Predicted Impacts of the Proposed Development

11.5.1 Do Nothing Scenario

The Do Nothing scenario includes retention of the current greenfield site. In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations will remain largely unchanged. The noise and vibration levels measured/noted during the baseline studies are considered representative of the Do-Nothing scenario. The Do-Nothing scenario is therefore considered to have a neutral impact.

11.5.2 Construction Phase Noise

Due to the fact that the construction programme has been established in outline form, construction noise associated with activities on site during this phase are reviewed for the purposes of determining the likely significant effects. Indicative ranges of noise levels associated with construction may be calculated in accordance with the methodology set out in BS 5228-1:2009+A1:2014. This standard sets out sound power and sound pressure levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels. However, it is not possible to conduct detailed accurate prediction calculations for the construction phase of a project due to the level of variability during different construction stages over short periods of time.

For site clearance, excavations and foundation works (excavators, loaders, dozers, concreting works, mobile cranes, generators), noise source levels are quoted in the range of 70 to 80 dB L_{Aeq} at distances of 10 m within BS 5228-1. For the purposes of this assessment, for initial stage works during clearance, excavations, foundations and piling, a sound power value of 115 dB L_{WA} has been used for construction noise calculations representing each of these phases of works. This would include, for example, 5 no. items of construction plant with a sound pressure level of 80 dB L_{Aeq} at 10 m, operating simultaneously along the closest works boundary, resulting in a total noise level of 87 dB L_{Aeq} along the closest works boundary This scenario is a robust assumption made for a development of this size, on the basis that it is unlikely that more than 5 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL. Alternatively this sound power level would also be applicable to a backhoe mounted hydraulic breaker or rock crusher operating at the closest works boundary.

Given the nature of the proposed construction phase which will include standard construction techniques across the site, once the ground preparation and foundation works have been completed, a large portion of the work will involve telehandlers, cranes and concrete placing booms which will offload to the manual finishing trades, with lower overall noise levels. For the purpose of this assessment a combined sound power value of 106 dB L_{WA} has been used for construction noise calculations during ongoing building works and compounds. This would include, for example one item of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq}

operating simultaneously within a work area resulting in a total noise level of 78 dB L_{Aeq} along the closest works boundary.

Construction noise levels have been calculated at the closest NSLs. NSL1 is located to the south-west at 125m distance to the site boundary. NSL2 is located at 240m distance to the south-west to site boundary. The next closest NSLs are located at distances greater than 400m. The calculations outlined below assume that there is no screening present and that the equipment will operate for 66% of the working time.

Construction phase	Sound power at construction works, dB L_{WA}	Calculated noise levels at the closest NSLs, dB $L_{Aeq,T}$	
		125 m	240 m
Site Clearance, Excavation, Rock Crushing, Road Works	115	62	56
General Construction, Compounds, Landscaping,	106	54	47

Table 11-12: Indicative construction noise levels at nearest noise sensitive locations

The worst case predictions detailed in Table 11-12 indicate that construction activities can operate within the adopted construction noise thresholds of 65 dB $L_{Aeq,T}$ at the closest NSL from the building works with higher noise emissions associated with site clearance, excavations, road works etc. Reference to Table 11-2 confirms the related impact is slight to moderate. The associated construction noise impact is determined to be **negative, not significant to slight and short-term** at distances of 125m and beyond.

The construction phase will be controlled through the use of construction noise threshold values which the contractor will be required to work within as much as is practicable. In this regard, the choice of plant, scheduling of works on site, provision of localised screening and other best practice control measures will be employed.

11.5.3 Construction Traffic

Construction traffic for the required works will enter the site via a haul route accessed from the Grange Castle West Access Road. The primary haul route is presented in Figure 11-11.

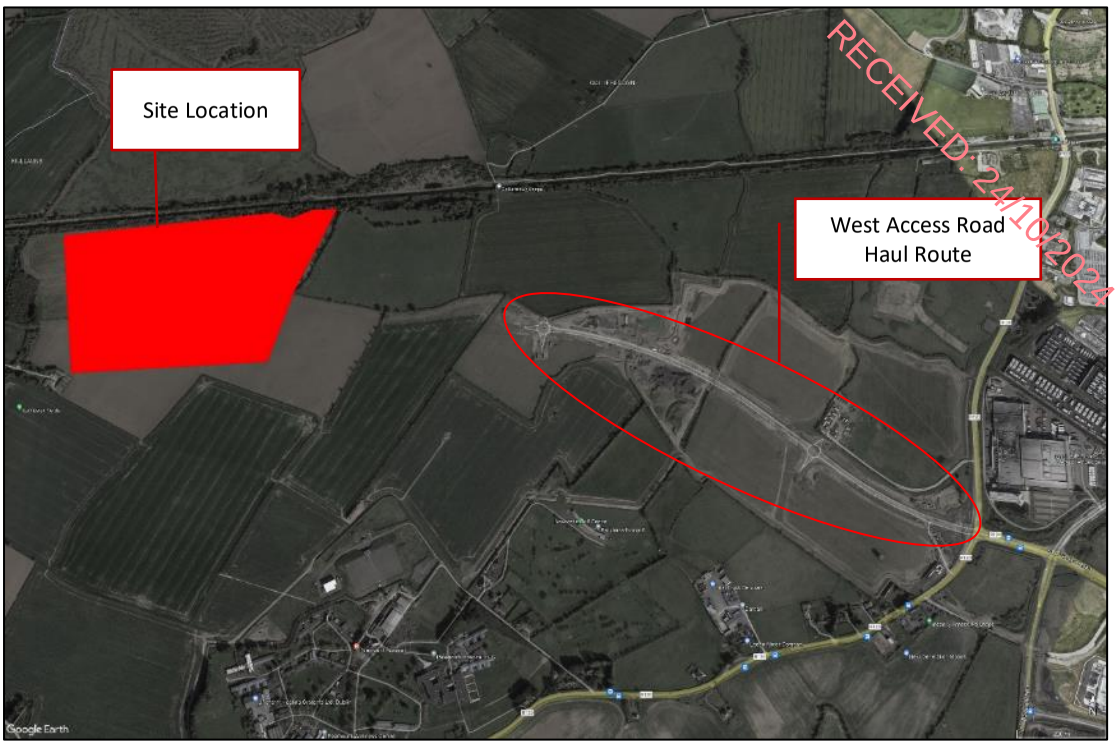


Figure 11-11: The West Access Road Haul Route

Forecast construction traffic volumes to and from the construction site are set out in the CEMP, which notes that following the completion of the initial site clearance works, the generation of HGV movements during the build period will be evenly spread throughout the day. A worst-case projection is that 5 Heavy Goods Vehicles (HGV) arrival and 5 HGV departure every 60 minutes during earthworks, which equates to a total of 10 trips per hour. A worst-case projection is that 10 LGV arrival and 10 LGV departure every 60 minutes, which equates to a total of 20 trips per hour.

Noise levels associated with passing event such as road traffic along the internal haul road may be expressed in terms of its Sound Exposure Level (L_{AX}). The Sound Exposure Level can be used to calculate the contribution of an event or series of events to the overall noise level in a given period using the following formulae:

$$L_{Aeq,T} = L_{AX} + 10log10(N) - 10log10(T)\ dB$$

where:

- $L_{Aeq,T}$ is the equivalent continuous sound level over the time period T (in seconds);
- L_{Ax} is the "A-weighted" Sound Exposure Level of the event considered (dB); and
- N is the number of events over the course of time period T.

A Sound Exposure Level (L_{AX}) reference values for HGVs and LGVs, which are 85 dB and 68 dB respectively at 10m from the road edge have been used for the assessment. The specific data has been obtained from specific source measurements undertaken from AWN's in-house data base of road vehicle sound exposure levels measured under controlled conditions for other applications. The L_{AX} values relate to vehicles traveling at a low to moderate speed.

The closest NSL is located 220m from the road's edge. Using a total value of 10 HGV and 20 LGV per hour along the site access road, the calculated noise level is 57 dB $L_{Aeq,1hr}$ at the closest

NSL. The related noise level is within the construction noise threshold value. Whilst construction traffic will increase traffic noise in the area, the overall traffic noise will be well within construction noise thresholds. The overall impact at properties along the haul route road edge is determined to be negative, not significant and short-term.

11.5.4 Construction Phase Vibration

The potential for elevated levels of vibration at sensitive locations during construction activities associated with the proposed development is typically associated with surface breaking activities used for ground works. During surface breaking activities, there is potential for vibration to be generated through the ground. Empirical data for this activity is not provided in BS 5228–2 (BSI 2014b), however the likely levels of vibration from this activity will be significantly below the vibration criteria for building damage based on monitoring data and experience from other sites. AWN Consulting has previously conducted vibration measurements under controlled conditions, during trial construction works on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 tonne breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 tonne breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10m to 50m respectively.

Whilst these measurements relate to a solid concrete slab, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity.

Referring to the vibration magnitudes above and Table 11-4 the vibration impacts will be below those associated with perceptible vibration and will be ***imperceptible to not significant and short-term.***

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Section 11.3.3.

11.5.5 Operational Phase

The primary potential sources of outward noise in the operational context are long term and will comprise noise associated with set construction, external filming activities in the back lot, building services plant noise, and traffic movements to and from the development site using the existing road network and newly constructed Grange Castle West Access road. Each of these are discussed in the following sections.

Noise Associated with Set Construction

Light construction works will be required during the operation phase of the development to produce various elements required for media production e.g. film sets and stages. It is anticipated, given the distances to the nearest noise sensitive locations and the likely noise

generated by the work that noise associated with such works will not be significant and will be below the proposed criteria set out in Section 11.3.4, notwithstanding the fact that the majority of these work will take place internally within studio buildings and therefore noise breakout will be insignificant.

The likely potential effects can be described as ***negative, not significant*** and ***long-term.***

External Filming Activities in the Back Lot of Studios

The buildings are designed for most of the production to occur in large sound attenuated studios organised with a "shooting lane" for the occasional exterior filming and exterior "back lot". Buildings 1, 2 and 3 backlots to the north of the site are largely screened from NSL01 by Buildings 15 and 16. The separation distance between the backlot area from Buildings 1, 2 and 3 along with the partial screening from Buildings 15 and 16 will provide at least a 45 dB reduction between the external filming activities and the closest NSL to the south west.

The "back lot" on the southwestern portion of the site associated with Building 14 is located at 275m distance to NSL01 and does not have any barriers or screening from studio buildings. The separation distance between the backlot area from Buildings 14 will provide at least a 45 dB reduction between the external filming activities and the closest NSL to the south west.

Assuming that the external filming activities are not in excess of 85 dB (A), which is comparable to the occupational noise limits set for employees' exposure, the predicted noise levels are less than 45 dB at NSL01 when external filming occurs at the closest backlot area (west of Building 14). These operational levels are assumed to be brief or temporary due to the nature of the works. They are also below the operational noise criteria set out in Section 11.3.4 for daytime and night-time periods.

Therefore, the likely potential effects from external filming activity noise can be described as ***negative, moderate*** and ***brief to temporary.***

In the event that external night-time filming works or special effects generating greater than 85 dB (A) are scheduled, suitable mitigation measures will be required. These mitigation measures are outlined in Section 11.6.2.

Building Services and Plant

There are a number of plant items associated with the operation of the proposed development. Most of this plant will be capable of generating noise to some degree. Noisy plant items located externally will potentially have the greatest impact on the receiving environment. The following assessment is based upon the preliminary information, which will be developed further during the detailed design phase in accordance with the requisite operational noise criteria. Based on the baseline noise data collected for this assessment it is considered an appropriate design criterion is the order of 40 dB $L_{Aeq,15min}$ during daytime and evening periods and 35 dB $L_{Aeq,15min}$ at night at the nearest sensitive receptors.

The layout of the proposed development includes dedicated areas on rooftops, typically containing air handling units and condenser units serving the various areas of the buildings. Given the type of plant item proposed and considering the distances from the proposed plant to the nearest NSL's, any building services noise emissions from rooftop plant servicing the development is not considered to be significant.

At times electrical generators and other plant will be hired by the companies using the facility, the generators will typically be used to service the studio buildings, the nearest (Building 14) is 300m from the nearest NSL to the southwest of the site (NSL1). Electrical generators have the potential to have high noise emissions however the mitigating factor is the noise attenuation over distance between the generators and the NSL. The separation between the closest studio buildings and the nearest NSL will provide approximately 45 dB reduction in sound pressure level from the generator to the NSL.

The selection of building services plant will ensure that noise levels comply with the criteria described above and in Section 11.3.4 It is acknowledged that the selection of the specific plant items and their final location is subject to change during the detailed design stage. However, noise from any new plant items will be designed and/or controlled so as not to give rise to any adverse impacts at the nearest noise-sensitive locations.

Furthermore, it is confirmed that no plant item will emit significant tonal or impulsive characteristics which may increase the potential for annoyance at the nearby noise sensitive locations.

The likely potential effects from building services noise can therefore be described as ***negative, not significant*** and ***long-term.***

Additional Vehicular Traffic on Public Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site and other planned developments on surrounding roads.

The predicted change in noise levels due to an increase in road traffic has been calculated for each of these roads. Projected traffic data used for the purpose of this assessment includes committed and planned developments in the vicinity of the project site as listed in Chapter 13 (Material Assets – Traffic and Transportation) of this EIAR. For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads surrounding the subject site with and without development using the Annual Average Daily Traffic (AADT) data.

Calculations have been performed to determine the expected increase in noise levels along all routes identified in Chapter 13, and summarised in below. The results of this assessment have been reviewed to predict any impact of the proposed development on traffic flows in the area. The calculated change in noise levels during Opening Year (2026) and Future Design Year (2040) are summarised in Table 11-13.

Arm	Opening Year (2026)				Design Year (2040)			
	Do Nothing AADT	Do Something AADT	% HGVs	Increase in noise level (all vehicles) dB	Do Nothing AADT	Do Something AADT	% HGVs	Increase in noise level (all vehicles) dB
A	13,492	13,852	11.2%	0.1	15,583	15,943	11.2%	0.1
B	15,497	15,929	9.5%	0.1	17,899	18,331	9.5%	0.1
C	9,177	9,445	5.4%	0.1	10,600	10,868	5.4%	0.1

Arm	Opening Year (2026)				Design Year (2040)			
	Do Nothing AADT	Do Something AADT	% HGVs	Increase in noise level (all vehicles) dB	Do Nothing AADT	Do Something AADT	% HGVs	Increase in noise level (all vehicles) dB
D	0	1,060	2.8%	52.7	0	1,060	2.8%	52.7

Table 11-13: Summary of Change in Noise Level (Opening Year 2026 / Design Year 2040)

The predicted increase in AADT traffic levels with links (A to D) to the associated development are in the order of 0.1 dB(A) in the vicinity of the existing roads assessed for the Opening Year and the Future Design Year. At the existing junctions, reference to Table 11-13 and Table 11-3 confirms that the increases in Design Year are ***negative, not significant*** and ***long-term.***

Arm D corresponds to the newly constructed Grange Castle West Access road. As there is no existing traffic along this route the change in noise levels is significant. However, when considered in context, the predicted noise level from the road is 39 dB at the closest NSL at 220m distance to the road. Existing road traffic noise from the R120 at comparable or higher noise levels is the dominant noise sources, and the worst case contribution from the newly constructed road is < 3 dB. Reference to Table 11-3 confirms that the increases in Design Year are ***negative, not significant*** and ***long-term***.

11.6 Mitigation Measures

11.6.1 Construction Phase Noise and Vibration

The assessment detailed in Section 11.5.2 and Section 11.5.4 has found that predicted construction noise and vibration levels do not exceed the thresholds whereby a significant impact would be likely. Therefore, while the contractor should employ best practice noise and vibration control measures, specific mitigation measures are not necessary for the proposed construction works.

11.6.2 Operational Phase Noise

In order to ensure that acceptable operational noise levels at the nearest noise sensitive locations are achieved, the following mitigation measures should be considered during the detailed design stage.

Noise emissions from external filming on backlots will be designed to ensure that noise levels at the façade of the noise-sensitive locations both within the development and in the surrounding area do not exceed the criteria discussed in 11.3.4 and Section 11.5.5. Due to the lack of building screening from backlot at Building 14 to NSL01, the operation of this backlot area the southwestern area of the site will limit hours of set construction and production and require notification to surrounding neighborhoods if night productions or special effects are expected to generate noise levels in excess of 80 dB (A) at 1m distance.

Noise emissions from building services plant will be designed to ensure that noise levels at the façade of the noise-sensitive locations both within the development and in the surrounding area do not exceed the criteria discussed in 11.3.4 and Section 11.5.5.

During the detailed design of the development, the selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission limits set out above are not exceeded. In addition to selecting plant with suitable noise levels, the following best practice measures are recommended where required, for all plant items in order to minimise potential noise disturbance for adjacent buildings:

- where ventilation is required for plant rooms, consideration will be given to acoustic louvers or attenuated acoustic vents, where required to reduce noise breakout;
- ventilation plant serving plant rooms will be fitted with effective acoustic attenuators to reduce noise emissions to the external environment;
- the use of perimeter plant screens for plant areas to screen noise sources;
- the use of attenuators or silencers on external air handling plant;
- all mechanical plant items e.g. fans, pumps etc. shall be regularly maintained to ensure that excessive noise generated any worn or rattling components is minimised, and
- Installed plant shall have no tonal or impulsive characteristics when in operation that would be audible at an NSL.
- If generators are located in close proximity to NSLs (within 100m at night-time) and have potential to exceed the operational noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.

11.7 Residual Impacts

This section summarises the likely residual noise and vibration effects associated with the proposed development following the implementation of mitigation measures.

11.7.1 Construction Phase

During the construction phase of the project there is the potential for short-term noise impacts on the nearest noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

For the duration of the construction period, construction noise impacts will be ***negative, not significant to slight*** and ***short-term*** at distances of 125m and beyond.

Vibration impacts during the construction phase will be ***neutral, imperceptible and short-term.***

11.7.2 Operational Phase

Noise Associated with Set Construction

The noise impacts associated with set construction works will not exceed the adopted design criterion at any nearby noise sensitive locations. The impact is predicted to be ***negative, not significant and long-term.***

External Filming Activities in the Back Lot of Studios

The noise impacts associated with external filming works will not exceed the adopted design criterion at any nearby noise sensitive locations. The impact is predicted to be ***negative, slight to moderate and brief to temporary.***

Building Services and Plant

Proprietary noise and vibration control measures will be employed as part of detailed design in order to ensure that noise emissions from building services plant do not exceed the adopted design criterion at any nearby noise sensitive locations. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. The impact from building services and plant is predicted to be ***negative, not significant and long term.***

Additional Traffic on Roads

The predicted change in noise levels associated with additional traffic is expected to be ***negative, not significant and long-term*** along the existing road network.

11.7.3 Operational Vibration

It should be noted that the day to day operation of the proposed development will not give rise to any significant levels of vibration off site and therefore the associated impact is ***neutral, not significant and long-term.***

11.8 Cumulative Impacts

11.8.1 Construction Phase

If construction activities at nearby sites are taking place concurrently with the construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need to be equal to those associated with the proposed development in order to result in any cumulative effect.

The implementation of mitigation and monitoring measures detailed in Section 11.6.1 as well as the compliance of the above permitted developments with their respective planning conditions, will ensure that each development will control noise and vibration impacts using best practice guidance documents and appropriate noise and vibration limits.

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be ***negative, slight to moderate and short-term.***

11.8.2 Operational Phase

There are a number of permitted and planned industrial developments located in the vicinity and a complete list of these developments is provided in Chapter 3.

During the operational phase any cumulative impacts will be due to plant noise operating from the granted sites in the night time period. Due to the propagation of sound over distance and the large distances between the closest receiver (NSL1) and the majority of the granted sites in the area (greater than 500m) there will be no audible contribution from the sites.

The following projects within 500m of the proposed development site boundary have been identified as having potential cumulative noise impacts to the surrounding NSLs and hence are considered in the cumulative scenario.

SDCC Reg. Ref.	Description	Distance to Site
SD188/0011	Site located within the Hazelhatch to 12th Lock, Co. Dublin. Permission for development consisting of: The Grand Canal Greenway, which will include the following features: 4.6km of shared walking and cycling Greenway along the existing northern Grand Canal towpath.	Adjacent to the proposed site, located to the north.
SD23A/0301 undecided	Site within the townlands of, Gollierstown and Milltown, (west of Grange Castle Business Park & The Adamstown Road (R120)), Newcastle, Dublin. Permission for development consisting of: The construction of five logistics / warehousing units (Units 1-5) with associated office accommodation, service yards, ancillary structures/areas, and substations.	Adjacent to the proposed site, located to the east.

Table 11-14: Current Permissions/Applications within 500m of the site that were granted in 2023. Note: Planning Application SD23A/0301 is pending decision.

Once operational, potential effects associated with The Grand Canal Greenway (SD188/0011) will be low in noise, i.e. people cycling and walking, limited vehicular activity at car parking areas, occasional maintenance works comprising management of surface and vegetation. These activities have not been added to the cumulative noise assessment as they will not be a dominant noise source at the closest sensitive receivers and will be at least 10 dB below the proposed development's predicted operational noise levels presented in Section 11.5.5.

Review of calculated noise levels associated with SD23A/0301 relate to intermittent activities associated with unloading / loading activity at the logistics centre. This activity has not been added to the cumulative noise assessment as it will not form part of the background noise environment.

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be ***negative, not significant*** and ***long-term***.

11.9 Interactions and interrelationships

This chapter has used information from the Traffic chapter 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 not significant due to the low-level changes in traffic flows associated with the proposed development.

11.10 References

British Standard 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;

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;

Design Manual for Roads & Bridges – Volume 11 Section 3;

EPA: Guidance Note for Noise – Licence Applications, Surveys and Assessments in Relation to Scheduled Activities NG4 (2012);

EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIA Reports) (2022)

IEMA Guidelines for Environmental Noise Impact Assessment, 2014.

ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise, and;

ISO 9613-2: 1996: Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.

12.0 MATERIAL ASSETS – WASTE MANAGEMENT

12.1 Introduction

This chapter evaluates the impacts, if any, which the proposed development may have on Material Assets - Waste as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU). In accordance with the methodology and for assessing and describing environmental effects set out in the EPA EIA Report Guidelines 2022 during the construction and operational phases of the proposed development, as described in Chapter 3 (Description of Proposed Development).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting (CB237501.0555WMR01) to guide and manage the waste generated during the excavation and construction phase of the proposed development and has been included as Appendix 12.1. 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 Consulting Ltd (ref CB/237501.0555WMR01) for the operational phase of the proposed development and is included in Appendix 12.2 of this chapter.

The Chapter has been prepared in accordance with the European Commission's '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 development site in accordance with legislative requirements and best practice standards.

12.1.1 Statement of Authority

This Chapter has been prepared by Chonaill Bradley (BSc ENV, PG Dip Circ Econ, AssocCIWM) of AWN Consulting. Chonaill 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 waste management.

12.1.2 Description of the Subject Site

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the proposed development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 3 (Description of the Proposed Development) of this EIA Report. Chapter 3 provides a detailed overview of the lifecycle of the project, including

reference to the architectural and civil engineering, drawings, plans, reports, and other relevant documentation in order to define the proposed development.

12.1.3 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.

A list of the relevant guidance documents which have informed the preparation of this Chapter is set out in Section 1.6 of Chapter 1. This Chapter is based on the proposed development, as described in Chapter 3 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site excavations); 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 12.4 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 as well as other available research sources.

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. This information is presented in Section 12.5.

A detailed review of the existing ground conditions on a regional, local, and site-specific scale are presented in Chapter 7 of this EIAR (Land, Soils and Ground Water).

12.1.4 Forecasting Methods and 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.

There is a number of licensed, permitted, and registered waste facilities in the South Dublin and EMR regions and across 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.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, and serviceability. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

All mitigation measures as set out in this chapter and the attached RWMP will be complied with. The overall predicted impact of the proposed development when mitigation measures, local and national waste, requirements, guidance, and legislation are followed will be **long-term, imperceptible and neutral.**

12.1.5 Legislation

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) 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 12.1).

Figure 14.1 *Waste Hierarchy (Source: European Commission).*

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (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 12.2).

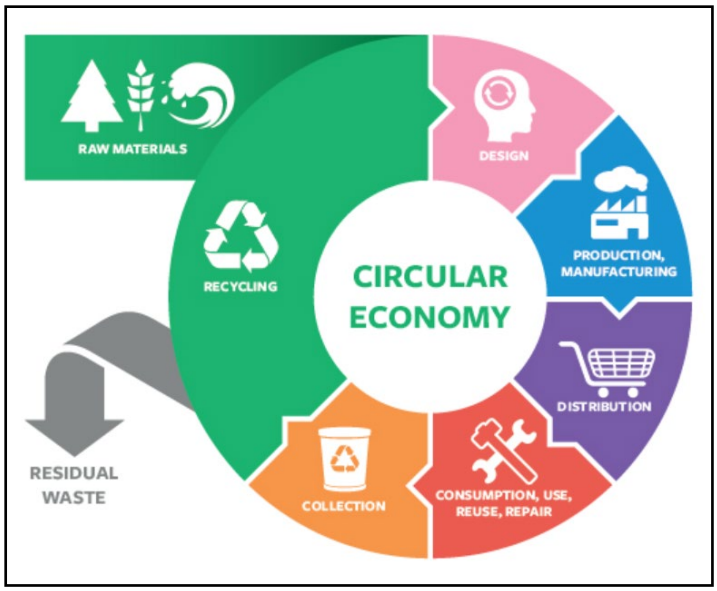


Figure 14.2 *Circular Economy (Source: Repak).*

The Irish government issues policy documents which outline measures aimed 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, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland, 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*, 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 work 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 national guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021, Draft National Waste Management Plan for a Circular Economy (NWMPCE) (2023), BS 5906:2005 Waste Management in Buildings – Code of Practice, the South Dublin County Council (SDCC) Household and Commercial Waste Bye-Laws 2018, 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.

12.1.6 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:

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:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
b) the adverse impacts of the generated waste on the environment and human health; or
c) 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 of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

12.2 Assessment Criteria

In terms of waste management, the receiving environment is largely defined by South Dublin County Council (SDCC) 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 *EMR Waste Management Plan 2015-2021* and the draft *National Waste Management Plan for a Circular Economy* (NWMPCE) (2023), which will supersede the three current regional waste management plans in Ireland. The waste management plans set out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

The Regional Waste Management Planning Offices have issued a new draft NWMPCE in June 2023, which is set to replace the EMR and the two other regional waste management plans. The Draft 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 South Dublin County Development Plan sets out the policies and objectives for the SDCC area which reflect those sets out in the regional waste management plan.

In terms of physical waste infrastructure, SDCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

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.

12.2.1 Demolition Phase

The site is currently agricultural land; thus, no demolition works will be required. However, topsoil and vegetation will be removed as a part of the site clearance prior to commencement.

12.2.2 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 required to ensure that the oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil and stones excavated to facilitate construction of the development. The development engineers (BMCE) have estimated that c.49,513m^3 of bulk excavation and removal will be required (excluding a 400mm layer of topsoil) of subsoil and rock. It is currently envisaged that 25,000m ^{3} of excavated material can be reused onsite, if suitable for reuse. When excavated materials is not deemed suitable or not required it will need to be removed for appropriate offsite 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 (Appendix 12.1).

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 (Appendix 12.1). 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 12.1.

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	821.8	10	82.2	80	657.5	10	82.2
Timber	697.3	40	278.9	55	383.5	5	34.9
Plasterboard	249.0	30	74.7	60	149.4	10	24.9

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Metals	199.2	5	10.0	90	179.3	5	10.0
Concrete	149.4	30	44.8	65	97.1	5	7.5
Other	373.6	20	74.7	60	224.1	20	74.7
Total	**2490.4**		**565.3**		**1691.0**		**234.1**

Table 12.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste.

12.2.3 Operational Phase

As noted in Section 12.1, an OWMP has been prepared for the development and is included as Appendix 12.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the buildings during the operational phase including dry mixed recyclables, organic waste and mixed non-recyclable waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, wood, metals, 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 12.2, below, and is based on the uses and areas as advised by the Project Architects.

Waste Type	m^3 per week
	Commercial Waste (Combined)
Organic Waste	2.36
Paper (Confidential)	1.97
Dry Mixed Recyclables	32.74
Glass	0.25
Mixed Non-Recyclables	13.00
Total	**50.33**

Table 12.2 *Estimated waste generation for the proposed development for the main waste types.*

The tenants and operator will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the tenants. As required, the tenants will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). All WSA's can be viewed on the plans submitted with the application. Facilities management will collect waste from the satellite WSAs and relocate them to the main waste storage yard.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021, the Draft NWMPCE and the SDCC waste Byelaws.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised in Section 12.5 below.

12.3 Predicted Impacts of the Proposed Development

12.3.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction (see Appendix 12.1 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 *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 *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 *short-term, significant,* and *negative*.

There is a quantity of material which will need to be excavated to facilitate the proposed development. It is estimated that c. 49,513m^3 of material (excluding topsoil) will 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 7 (Land, Soils and Ground Water). It is anticipated that 29,513m^3 of excavated material will need to be removed off-site. When material has to be removed, 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 *short-term, significant,* and *negative.*

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12.3.2 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 which is not suitable for recycling is typically 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.*

It is anticipated that Waste contractors will be required to service the proposed development on a scheduled basis to remove waste. 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.*

12.4 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 so as to minimise the effects on the environment. The concept of the 'waste hierarchy' and 'Circular Economy' is 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.

12.4.1 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 EPA, *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)* and is included as Appendix 12.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of 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 phase of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 12.1) in compliance with any planning conditions, 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 implement the RWMP throughout the duration of the proposed excavation and construction phase.

A quantity of topsoil, sub soil and bedrock will need to be excavated to facilitate the proposed development. The Project Engineers have estimated that approximately 25,000m^3 of excavated material (if suitable) can be reused on-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.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen 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;
    - Plasterboard
    - Metals;
    - Glass;
    - Timber; and
    - Waste generated by workers activities.
- Left over materials (e.g. timber off-cuts, concrete, and metal) 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.

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, the EMR Waste Management Plan 2015 – 2021 and the draft NWMPCE (2023). It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved and will promote more sustainable consumption of resources.

12.4.2 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 12.2. 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 EMR Waste Management Plan 2015 – 2021, draft NWMPCE Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the SDCC waste byelaws.

The Operator / Facilities Management 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.

The following mitigation measures will be implemented:

- The Operator / Facilities Manager 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)
  - Light bulbs
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.)
  - Timber
  - Metal
  - Styrofoam

  - Plasterboard; and,
  - Furniture (and from time-to-time other bulky waste)
- The Operator / Facilities Manager 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 Operator / Facilities Manager 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 Operator / Facilities Manager 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 proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, *the Litter Pollution Act 1997*, the *EMR Waste Management Plan 2015 – 2021, the draft NWMPCE* and the SDCC Waste Management Byelaws 2020. It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved.

12.5 Residual Impacts

The implementation of the mitigation measures outlined in Section 12.5 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 European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

12.5.1 Construction Phase

A carefully planned approach to waste management as set out in Section 12.5.1 and adherence to the RWMP (which includes mitigation) (Appendix 12.1) during the construction phase will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction phase on the environment will be *short-term, imperceptible,* and *neutral.*

12.5.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 12.5.2 and adherence to the OWMP (which includes mitigation) (Appendix 12.2) 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.*

12.6 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.

A review of the permitted and proposed developments, as set out in Chapter 3 of this EIAR, has been undertaken to identify any substantial projects that are concurrent with the construction phase of the proposed development that may result in cumulative effects in respect of waste management.

This review identified the permitted developments outlined in Chapter 3, which are capable of combining with the proposed development and have the potential to result in significant cumulative effects due to their scale and close proximity to the proposed development site.

12.6.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. Multiple developments in the area could potentially be developed concurrently or overlap in the construction phase.

Developments that have been assessed as part of the cumulative impact and that could potentially overlap during the construction phase are covered in Chapter 3 of this EIAR.

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 effect will be *short-term, not significant,* and *neutral.*

12.6.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in the area. 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 minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a *long-term, imperceptible,* and *neutral.*

12.7 References

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- BS 5906:2005 Waste Management in Buildings – Code of Practice.

- 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.
- Department of Communications, Climate Action, and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (2020).
- Department of Environment and Local Government (DELG) (1998). Waste Management – Changing Our Ways, A Policy Statement.
- Department of Environment, Communities and Local Government (DECLG) (2012). A Resource Opportunity - Waste Management Policy in Ireland.
- South Dublin County Council (SDCC) Household and Commercial Waste Byelaws 2018.
- SDCC, *South Dublin County Development Plan 2022-2028* (2022).
- Regional Waste Management Planning Offices, draft *National Waste Management Plan for a Circular Economy (June 2023).*
- Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects' (2021).
- Department of Environment, Heritage, and Local Government (DEHLG) (2006). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.
- Eastern Midlands Regional Waste Management Plan 2015-2021 (2015).
- Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021.
- EPA, Waste Classification-List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018).
- EPA and Galway-Mayo Institute of Technology (GMIT) (2015). EPA Research Report 146-A Review of Design and Construction Waste Management Practices in Selected Case Studies-Lessons Learned.
- FÁS and the Construction Industry Federation (CIF) (2002). Construction and Demolition Waste Management-a handbook for Contractors and Site Managers.
- Forum for the Construction Industry-Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
- Environmental Protection Agency Act 1992, as amended.
- 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).

13.0 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

13.1 Introduction

Barrett Mahony Consulting Engineers have prepared this chapter of the EIAR. This chapter presents the operational and construction traffic impact assessment of the proposed infrastructure to enable development of the subject proposal on the existing traffic and transportation environment, and details of the traffic inputs required for other assessments contained within this EIAR.

The proposed development will include the construction of:

- 6 no. Stage buildings (buildings 1,2,3,11,13 &14) ranging in height between c. 20m and c. 23 m and comprising 11 no. Internal sound stages with overhead catwalks and 2-storey ancillary production offices including office space, plant and switch rooms, toilets, ICT rooms, staff toilets and showers and rooftop plant (totalling c. 35,187 sq. m);
- 4 no. workshops (buildings 15,16,17 &18) ranging in height between c. 9m and c. 10.5 m and comprising internal workshop areas, staff toilets and showers, ICT, plant and switch rooms(totalling c. 18,244 sq. m);
- TV studio and reception (building 4) comprising 3 no. TV studios (c. 17.8m height) and various supporting spaces across 3 floors including backstage shooting area, green rooms, hair and makeup rooms, production suites with ancillary offices, wardrobe, laundry room, Technical support offices, vision dept, lighting dept, pro service, run and crew kit room, chief engineer office, studio manager office, scenic store, props store, cameras and grip room, lighting and electrical room, plant room, sound control rooms, vision rooms, recording rooms and toilets at ground floor level; standard dressing rooms, tv post production spaces, kitchen and crew area, toilets, mechanical/electrical room, technical offices, media store at first floor level; star dressing rooms, tv post production, lounge and kitchen and toilets at second floor level; Single storey reception building to include guest holding areas, VIP and Guest service, security offices, staff toilets, showers and locker rooms (c. 10,875sq. m);
- 2-storey Dining Hall with ancillary 100 seat theatre (building 6) comprising indoor and outdoor dining areas, kitchen, storage and mechanical rooms, toilets and 3 no. meeting rooms at ground floor level; office space and covered outdoor balconies at First floor level (c. 4,351sq. m)
- Standalone café (building 5) (c. 96 sq. m)
- 3 no. single storey production suites (buildings 7,8 & 9) comprising offices, conference room, kitchenette, communal areas and toilets (totalling c. 795 sq. m);

It is envisaged that 1265 No. staff will be employed on site during a typical day, with a much smaller number (70 No.) on site during the night shift.

Other assessments carried out for the purpose of informing this EIAR, namely the Air Quality and Noise assessments, require traffic information for the assessment to be completed. Specifically, Annual Average Daily Traffic (AADT) volumes and percentage of Heavy Goods Vehicles (HGVs) on impacted road links are required. The following sections presents AADT data, and the methodology used.

Mitigation measures are included, where relevant, to ensure the Proposed Development is constructed and operated with minimal impact on the receiving road environment. The focus of the assessment is however primarily on the operational stage, which is anticipated to have a longer-term impact on the prevailing environment than the construction stage. Relevant mitigation measures are also presented in this chapter.

This chapter has been prepared by Martin Rogers, BA, BE, M.EngSc, PhD, CEng, TPP MICE, MRTPI, MTPS, Transport Planning Professional, Chartered Civil Engineer and Chartered Town Planner.

Martin has over 40 years' experience across a range of similar type and scale developments including preparation of Traffic Impact Assessments and EIAR's for previous applications such as

- Claremont Howth (ABP-306102-19 / FCC);
- Concorde, Naas Road (ABP-304383-19 / DCC);
- Cookstown Enniskerry (ABP-307089-20 / WCC); and
- Airton Road, Tallaght (ABP-306705-20 / SDCC).

The purpose of this chapter is to evaluate the existing transport environment and to detail the results of assessment work undertaken to identify the Proposed Development's impact on this environment. The scope of the assessment covers transport and related sustainability issues including means of vehicular access, pedestrian and cyclist facilities, and local public transport availability.

There is a separate Traffic & Transport Assessment and Mobility Management Plan for this project that should be read in conjunction with this chapter.

13.2 Study Methodology

The assessment of the potential impact of the Proposed Development on the material assets in the area was carried out according to the methodology specified by the EPA and the specific criteria set out in the Guidelines on Information to be contained in an Environmental Impact Assessment Report, 2022.

The traffic analysis undertaken on the basis of 1.7% annual growth in network traffic over the period 2019 to 2030 period, decreasing to 0.6% in the 2030 to 2041 period, with the 'medium growth' assumption for the four planning authorities within the Dublin city area as detailed within the 2016 Transport Infrastructure Ireland document 'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections', PE-PAG-02017-2 May 2019.
The following sources of information were used in the completion of this assessment:

- Smarter Travel A Sustainable Future (2009-2020).
- Greater Dublin Area Transport Strategy, 2016-2023
- Travel Plans – A Good Practice Guide foe developers - Surrey County Council, UK, 2018
- South Dublin County Council Development Plan 2022-2028

- 'Traffic and Transport Assessment Guidelines' (May 2014) National Road Authority;
- 'Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003); and
- 'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation.
- The Chartered Institute of Highways and Transportation (CIHT) Guidelines for Traffic Impact Assessments 1994.

The methodology included a number of key inter-related stages;

- Background Review: This background review is broken down as follows:
    1. An examination of the local regulatory and development management documentation.
    2. An analysis of previous 'transport' related, strategic and site-specific studies of development and transport infrastructure proposals.
- Traffic Counts: Classified junction traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.
- Trip Generation: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed development.
- Trip Distribution: Based upon both the existing and future (for the adopted assessment horizon years) network characteristics, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network using the following software:
    1. TRL OSCADY Junctions 10 software – Roundabout Junction
    2. TRL PICADY Junctions 10 software - Priority Junction
- A spreadsheet model was created containing baseline year do-nothing traffic flow data.
- Future year traffic forecasts were derived from TII growth factors and development trip generation figures. These traffic flows were applied for the baseline year (2023), the proposed year of opening (2026), 5 and 15 years after opening (the Design Year Assessments).

<u>Scoping Study</u>

The scope of the traffic assessment was agreed in consultation with the South Dublin County Council

13.3 Receiving Environment - Baseline

13.3.1 Location

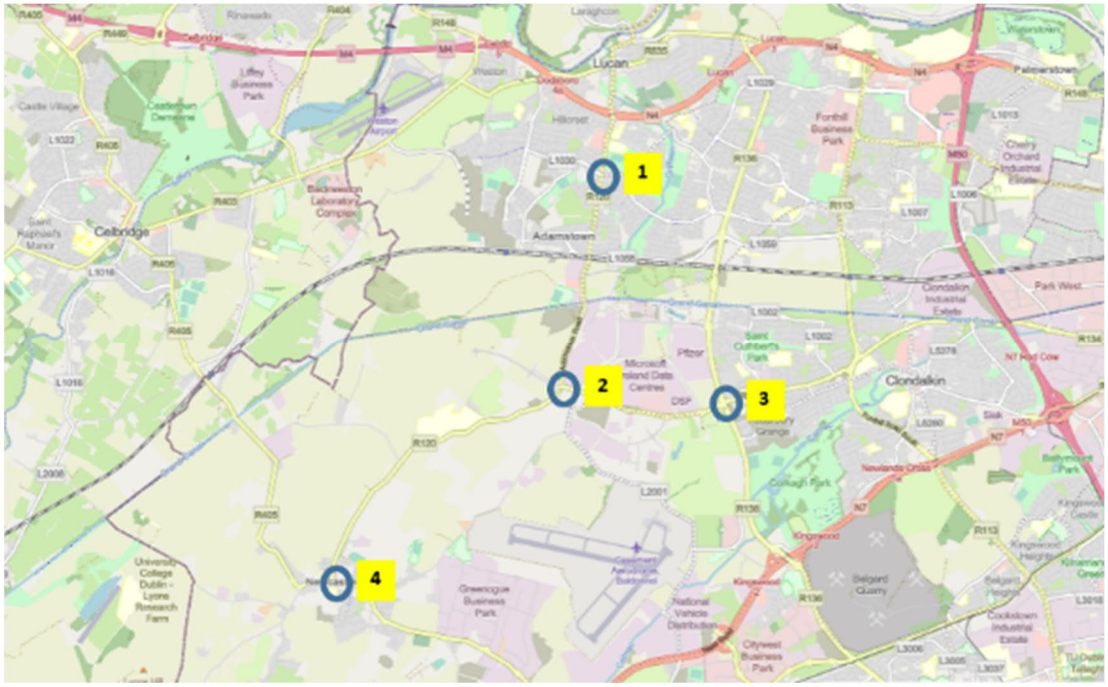
The site is a greenfield site which is currently used for agriculture and is located west of the Grange Castle Business Park approximately 10km west of Dublin City Centre. The site is bound to the east and south by agricultural lands, to the west by Grange Castle Business Park, and to the north by the Grand Canal.

Figure 13-1 below details the site location of the proposed media park at Grange Castle, Co. Dublin.

Figure 13.1 – Site Location of proposed Media Park at Grange Castle, Co. Dublin

13.3.2 Local Road Network

The proposed development will access via Junction 2 as detailed within Figure 13-2 below, eastwards onto the R134 towards Junction 3 and northwards / southwards via the R120 towards Junction 1 / Junction 4.



- Junction No. 1 - Newcastle Road/L1011/L1030
- Junction No. 2 - R120/New Nangor Road (R134)/Access to Grange Castle
- Junction No. 3 - New Nangor Road/R136
- Junction No. 4 - Peamount Road/Main Street/Athgoe

Figure 13-2: Location of critical junctions

The local road network is high quality, with the R120 and R134 links having 2 No. carriageways in each direction close to the site entrance.

As the R120 proceeds both northwards and southwards away from the site, the road reduces to 1 No. carriageway in each direction.

13.3.3 Local Walking and Cycling Network

There are at present limited walking opportunities in the locality.

The walking route from the site to the Adamstown rail station is noted within the existing rail infrastructure section.

Figure 13-3 details the existing cycle facilities, including routes along the R136, and the greenway route north of the site:

Figure 13-3: Existing cycle facilities close to site

13.3.4 Public Transport – Bus

There are presently 2 No. main bus routes servicing Grange Castle Business Park, the 13 and 68.

Table 13-1 below details the origin, destination and AM peak frequency of the routes:

Route	Origin	Destination	Frequency
Route 13	Harristown	Grange Castle	5 per hour
Route 68	Hawkins Street	Newcastle	1 per hour
TOTAL			5 PER HOUR

Table 13-1: Major routes close to site, and their frequency at peak times

Both routes are accessible from the R120, located approximately 1.25km east of the site of the proposed development.

The bus connects plan resulted in the introduction in 2023 of the W4 Orbital Route, running from The Square in Tallaght to Blanchardstown Shopping Centre every 15 minutes during the morning weekday peak hour (see Figure 13-4 for bus route details).

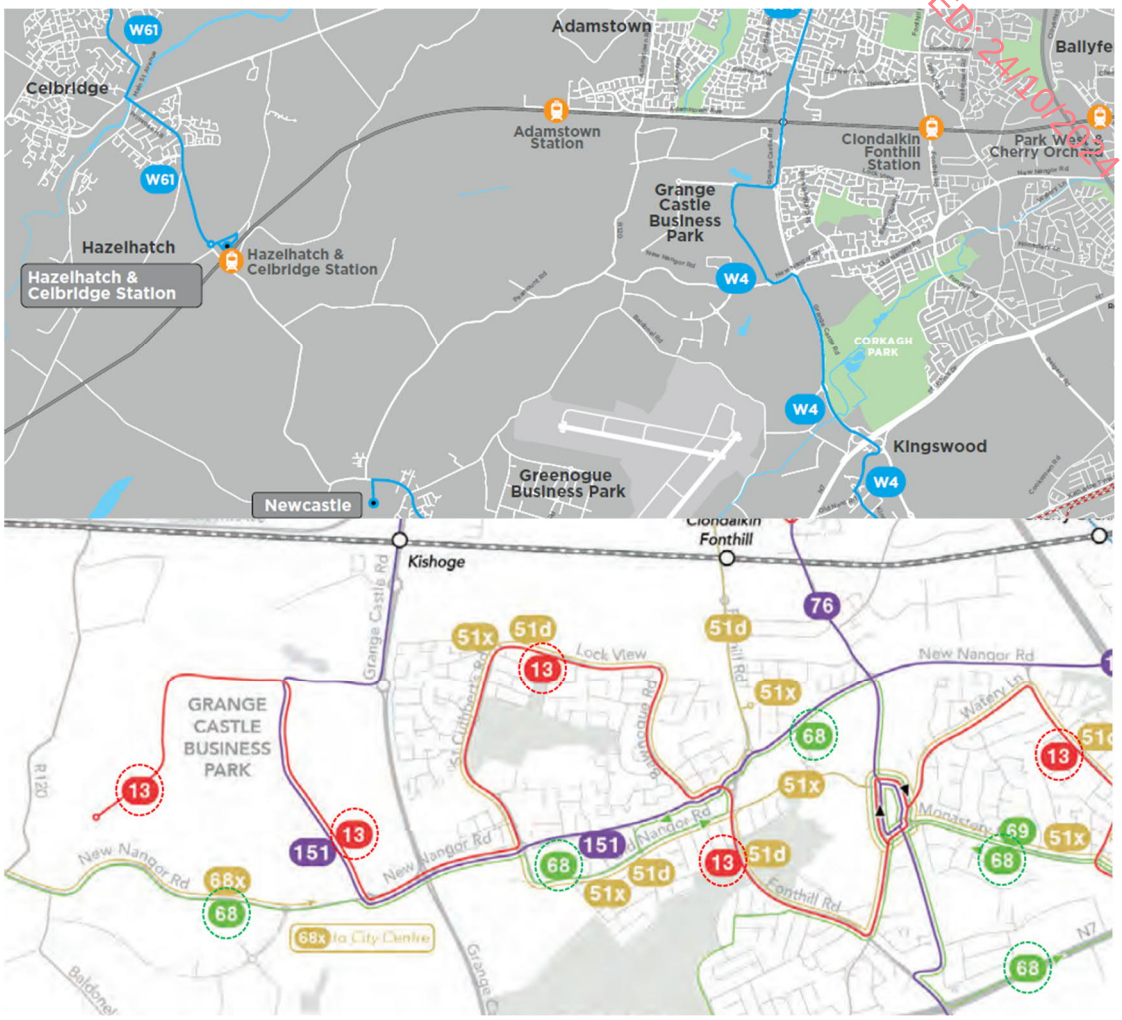


Figure 13-4: Route of existing W4, 13 and 68 bus routes

13.3.5 Public Transport – Rail

The Adamstown stop on the Kildare Rail Commuter line is a 2.5 km walk from the site of the proposed development.

Figure 13-5 indicates the location of the Adamstown stop relative to the site of the proposed development, and Figure 13-6 details the location of the Adamstown stop within the Greater Dublin Area rail network:

Figure 13-5: Adamstown rail stop relative to location of subject site and walking route to station

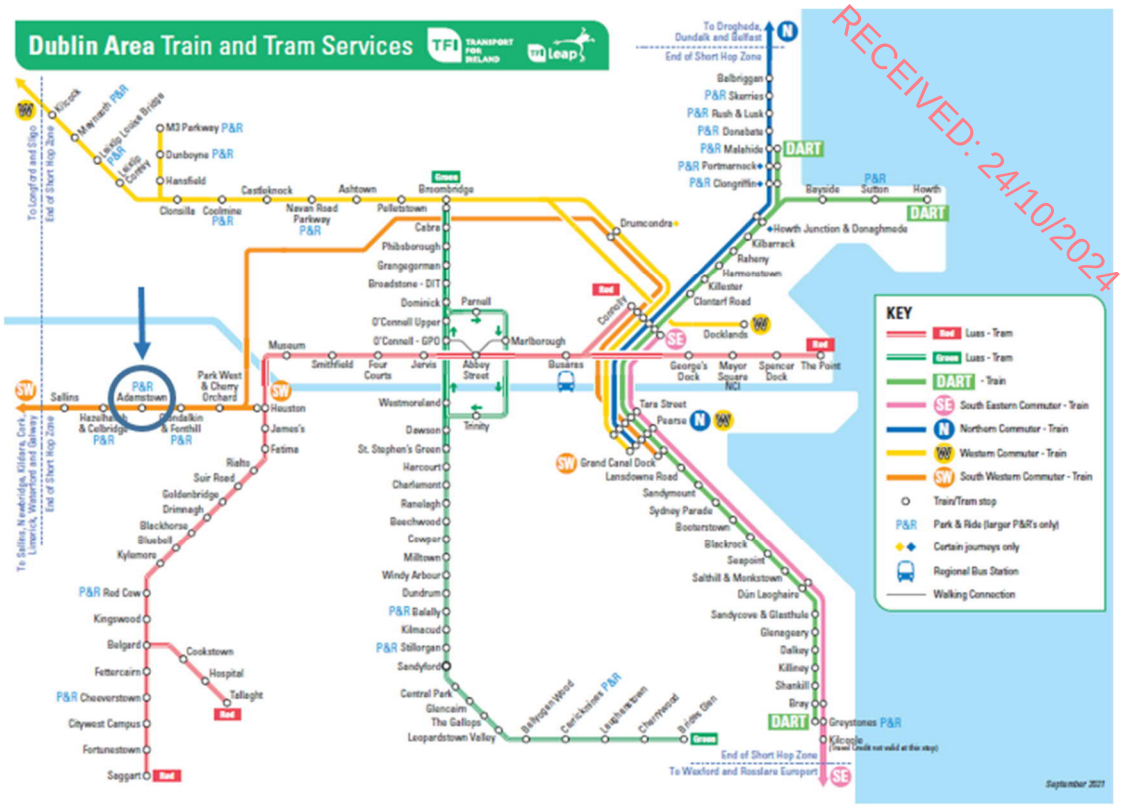


Figure 13-6: Location of Adamstown stop within Dublin Area Rail Network

13.4 Existing Traffic Conditions

13.4.1 Background Traffic Surveys

As part of the previous Traffic and Transport Assessment (TTA) undertaken by BMCE, traffic surveys were scoped and agreed with South Dublin City Council (SDCC) prior to completion of the assessment.

Figure 13.2 illustrates the locations of the critical junctions where the surveys were completed.

12-hour surveys (7AM to 7PM) were carried out Thursday 19th October 2023 in order to estimate flow volumes on the local road network at the above 4 No. junctions as follows (west to east):
Junction No. 1 - Newcastle Road/L1011/L1030
Junction No. 2 - R120/New Nangor Road/Access to Grange Castle
Junction No. 3 - New Nangor Road/R136
Junction No. 4 - Peamount Road/Main Street/Athgoe

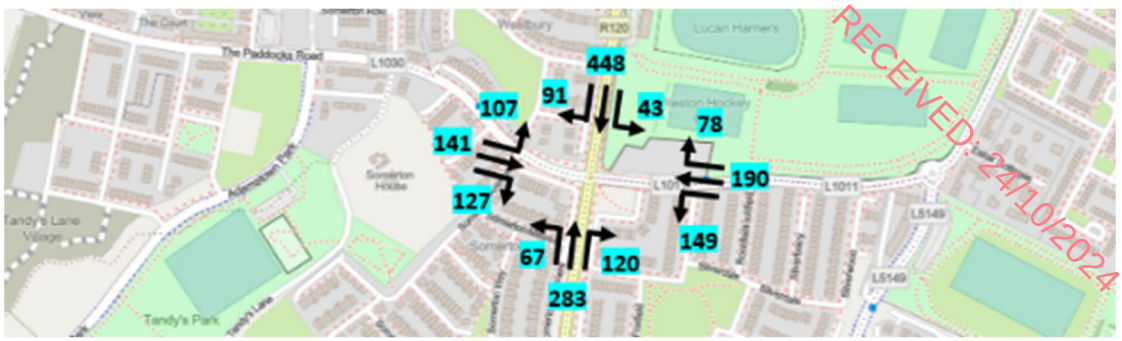
The AM peak and PM peak flows are as follows all flows in passenger car units (PCU):

Morning peak
Junction No. 1 - Newcastle Road/L1011/L1030 - 1844 PCU
Junction No. 2 - R120/New Nangor Road/Access to Grange Castle - 1637 PCU
Junction No. 3 - New Nangor Road/R136 - 3599 PCU
Junction No. 4 - Peamount Road/Main Street/Athgoe - 1273 PCU

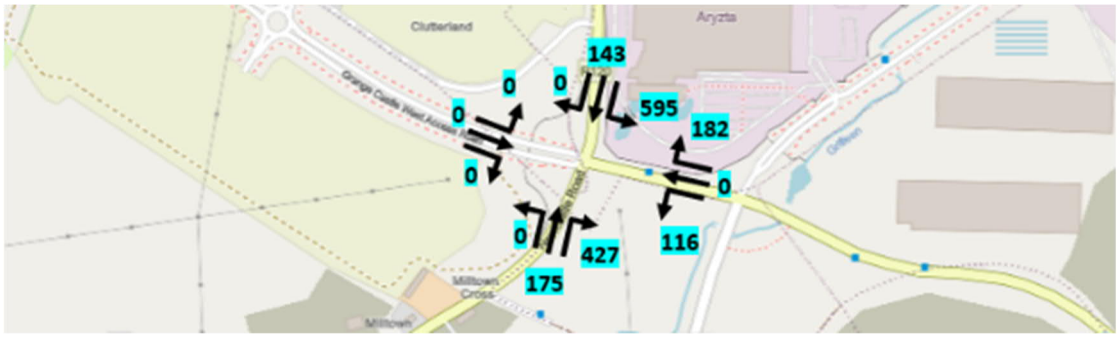
Evening peak
Junction No. 1 - Newcastle Road/L1011/L1030 - 1844 PCU
Junction No. 2 - R120/New Nangor Road/Access to Grange Castle - 1634 PCU
Junction No. 3 - New Nangor Road/R136 - 3985 PCU
Junction No. 4 - Peamount Road/Main Street/Athgoe - 1366 PCU

One can thus conclude that Junctions 1, 2 and 4 are quite lightly trafficked throughout the day, with junction 3 experiencing heavier flows.

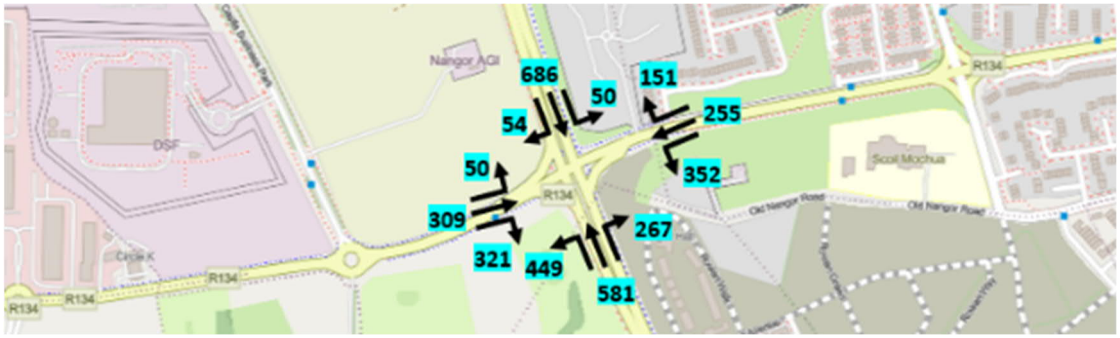
Flow diagrams for the morning peak, evening peak and all-day at the 4 No. junctions are contained both within Figures 13-7 and 13-8 below.



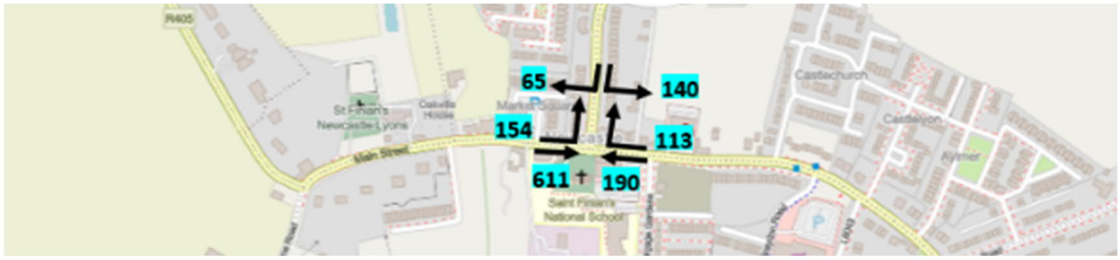
JUNCTION 1



JUNCTION 2

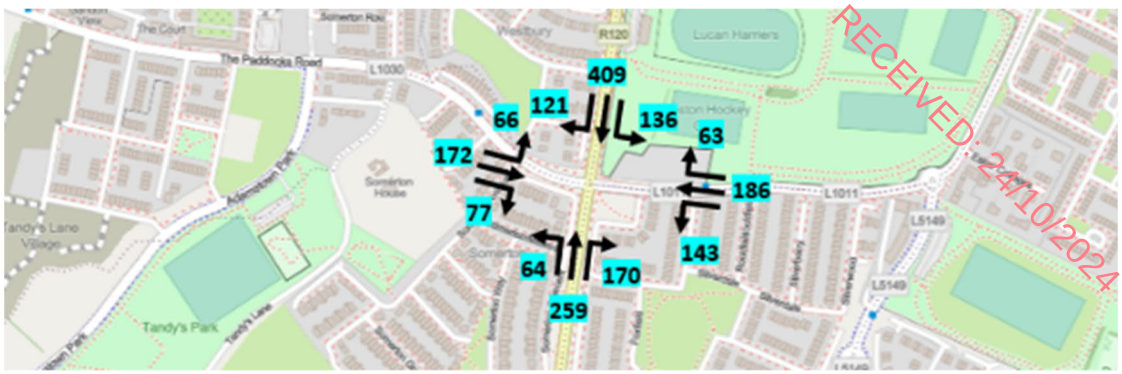


JUNCTION 3



JUNCTION 4

Figure 13-7: Morning peak flows at 4 No. surveyed junctions



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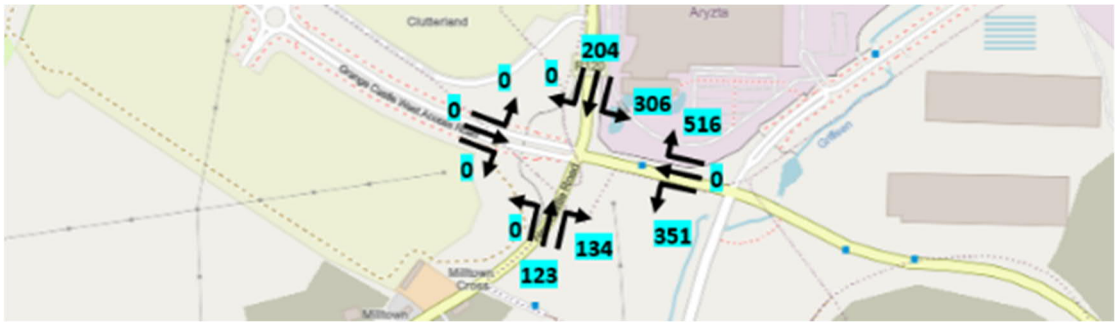
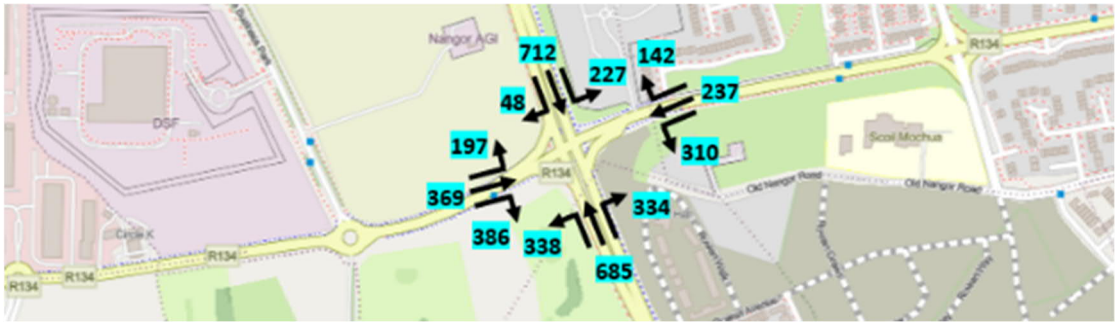


JUNCTION 2



JUNCTION 3

JUNCTION 4

Figure 13-8: Evening peak flows at 4 No. surveyed junctions

Tables 13-2 details the morning peak hour, evening peak hour and 7AM to 7PM flows at all 4 No. junctions on Thursday 19th October 2023:

		OCTOBER 2023 TRAFFIC SURVEY RESULTS		
		8AM - 9AM	5PM - 6PM	7AM-7PM
1	Newcastle Road/L1011/L1030	1844	1865	20140
2	R120/New Nangor Road/Access to Grange Castle	1637	1634	15327
3	New Nangor Road/R136	3599	3985	37587
4	Peamount Road/Main Street/Athgoe	1273	1366	10882

Table 13-2: Total AM Peak, PM Peak and All-day Flows at 4 No. surveyed junctions on 19th October 2023

These are the figures utilized within the original Traffic and Transport Assessment within the initial application.

Additional 24-hour surveys were commissioned for three separate days in September 2024.

Tables 13-3 to 13-5 detail the morning peak hour, evening peak hour and 7AM to 7PM flows at all 4 No. junctions on Tuesday 17th September, Wednesday 18th September and Thursday 19th September respectively:

		17TH SEPTEMBER 2024 TRAFFIC SURVEY RESULTS		
		8AM - 9AM	5PM - 6PM	7AM-7PM
1	Newcastle Road/L1011/L1030	1791	1941	20083
2	R120/New Nangor Road/Access to Grange Castle	1579	1484	14816
3	New Nangor Road/R136	3656	4100	36933
4	Peamount Road/Main Street/Athgoe	1311	1321	10773

Table 13-3: Total AM Peak, PM Peak and All-day Flows at 4 No. surveyed junctions on 17th September 2024

		18TH SEPTEMBER 2024 TRAFFIC SURVEY RESULTS		
		8AM - 9AM	5PM - 6PM	7AM-7PM
1	Newcastle Road/L1011/L1030	1723	1917	20385
2	R120/New Nangor Road/Access to Grange Castle	1639	1638	15226
3	New Nangor Road/R136	3708	3896	37598
4	Peamount Road/Main Street/Athgoe	1328	1341	11740

Table 13-4: Total AM Peak, PM Peak and All-day Flows at 4 No. surveyed junctions on 18th September 2024

		19TH SEPTEMBER 2024 TRAFFIC SURVEY RESULTS		
		8AM - 9AM	5PM - 6PM	7AM-7PM
1	Newcastle Road/L1011/L1030	1857	2043	20604
2	R120/New Nangor Road/Access to Grange Castle	1570	1658	14926
3	New Nangor Road/R136	3680	3961	36666
4	Peamount Road/Main Street/Athgoe	1117	1341	11048

Table 13-5: Total AM Peak, PM Peak and All-day Flows at 4 No. surveyed junctions on 19th September 2024

Table 13-6 details the average variations in survey results over the three days in September 2024, relative to those obtained eleven months earlier in October 2023:

		AVERAGE 2024 INCREASE / DECREASE RELATIVE TO 2023 RESULTS		
		8AM - 9AM	5PM - 6PM	7AM-7PM
1	Newcastle Road/L1011/L1030	-2.9	5.5	1.1
2	R120/New Nangor Road/Access to Grange Castle	-2.5	-2.5	-2.2
3	New Nangor Road/R136	2.3	0.0	-1.4
4	Peamount Road/Main Street/Athgoe	-1.6	-2.3	2.8

Table 13-6: Total AM Peak, PM Peak and All-day Flows at 4 No. surveyed junctions on 19th September 2024

Given that the surveys were nearly one calendar year apart, 11 No. of the 12 No. percentage increases / decreases are in the +3% / -3% range, 7 No. decreasing and only 3 No. increasing, with one at zero change. Of the 12 No. results, only 1 No. shows an increase just greater than 5%.

It should be noted that TII traffic growth rates for 2023-2030 used within this report assume growth rates of 1.7%. In addition, the revised Mobility Management Plan for this proposal has decreased the predicted trip generation figures on the basis that, on the day-of-opening of the proposed development, 62% of workers rather than the 70% originally assumed within the TTA as first submitted, is now predicted, reducing to 50% of the workforce by year 5.

Thus, the September 2023 survey data is confirmed as being robust and conservative relative to the September 2024 survey results.

This report will therefore utilise the 2023 traffic survey results to analyse critical junctions.

Furthermore, in the interests of robustness, the trip generation analysis will continue to assume 70% of the worker population travel by car, even though, as detailed within the revised Mobility Management Plan, 62% of workers are assumed to arrive / depart by car, with the balancing 38% using sustainable means of travel, with arguments detailed as to how this is to be achieved. A further reduction to 50% car travel / 50% sustainable travel is assumed by year 5, again with details of how this is to be achieved.

13.4.2 Future Year Background Traffic Growth

The operational impact of traffic on the road network within the Proposed Development's area of influence has been assessed for the following years:

1) 2023 - Baseline year - existing flows

2) 2026 - Proposed opening year
3) 2031 - 5 years after opening
4) 2041 - Design year (15 years after opening)

Unit 5.5 of the TII Project Appraisal Guidelines (Link-Based Traffic Growth Forecasting) has been used to apply growth factors to the existing traffic flows to obtain new baseline for current year 2012 and future year junction assessments. The factors applied are given in Table 13.7.

An annual growth rate of 1.7% has been assumed for the period late-2023 to 2030, decreasing to 0.6% for 2031 to 2041, based on the central / medium growth estimate for the Dublin Metropolitan Area, published by TII in 2019 (PE-PAG-02017-2).

Baseline Year 2023	Year of Opening 2026	5 Years After Year of Opening 2031	15 Years After Year of Opening 2041
-	+ 5.2%	+ 13.2%	+ 20.2%

Table 13.7: Predicted Existing Traffic Volumes.

Relevant nearby committed developments have been identified and have allowed for within the background traffic flows for the future assessment years.

13.5 Do Nothing Scenario

It should be noted that the Do Nothing scenario is equivalent to the baseline environment. The assessment of the existing environment/Do Nothing Scenario, without the Proposed Development, has been included for the Operational Phase assessment (see below).

13.6 Construction Phase Impacts

13.6.1 Site Access and Vehicular Routes

The main construction access for the project will be from the Grange Castle West Access Road. However, access routes to and from the site, delivery times and off-loading proposals will be formally agreed with SDCC. In developing the construction and logistics plans, the Main Contractor will fully include representatives of SDCC, and other interested parties in a consultation process to ensure that our intentions are properly communicated, agreed and do not unduly affect the surrounding residential, retail properties and public open space.

All deliveries of materials, plant and machinery to the site and removals of waste or other material, will take place within the permitted hours of work. Vehicle movements will be planned to ensure arrival and departure times are maintained inside the agreed working hours. No daytime or nighttime parking of vehicles will be permitted outside agreed areas. The logistics plans indicate the site access routes at each stage of the project, initially utilizing existing access routes and subsequently the new permanent access routes.

- Vehicles delivering concrete, reinforcement and other building materials
- Vehicles delivering large material (example facade panels, steel frame, etc.)

A Construction Traffic Management Plan (CTMP) which will be submitted to SDCC for approval prior to the commencement of the works.

13.6.2 Construction Traffic Trip Generation

The main construction items include earthworks, substructure, superstructure construction, and fit-out. It is expected that construction traffic to and from the site shall reach a peak during preliminary earthworks.

The programming and scheduling of fill material will be managed by the main Contractor. A worst-case projection is that 5 Heavy Goods Vehicles (HGV) arrival and 5 HGV departure every 60 minutes during earthworks, which equates to a total of 10 trips per hour.

In addition to HGV traffic, periodic deliveries of materials to site shall be made by Light Goods Vehicles.

Light Goods Vehicles (LGV) trips are unlikely to occur frequently during earthworks involving HGVs. In addition, LGVs deliveries shall be scheduled to take place outside of the peak traffic hours. A worst-case projection is that 10 LGV arrival and 10 LGV departure every 60 minutes, which equates to a total of 20 trips per hour.

These volumes are significantly lower than projected peak hour operational traffic.

The Applicant will monitor the programming and scheduling of fill material as follows:

- The main contractor will be required to provide a detailed construction stage programme and construction management plan at pre-commencement stage. This will be required to include anticipated construction traffic figures for the enabling / earthworks.
- The main contractor will be required to keep a daily record of all construction vehicles entering the site (including vehicles hauling fill material). The record will include vehicle type, registration and delivery type.
- This record will be kept by the site gate personnel, in the normal manner, and passed (on weekly basis) to the senior site management staff for assessment and dissemination to the Applicant and Design Team.
- The site management for Grange Castle Media Park will be required to liaise on a regular basis with the site management of adjoining sites and including adjacent third-party construction sites, on matters of interface, including construction traffic.

- The Applicant and Design Team has considered the anticipated peak vehicle movements during preliminary earthworks.
- It is intended to re-use as much of the fill as possible (e.g. re-use of crushed rock in backlog area. It is conservatively assumed that 50% of cut material will be exported off site approx. 25,000m3.

However, the Applicant is proposing the following further risk mitigation measures:

- At pre-commencement stage, the Applicant shall provide a Community Liaison Plan (alongside a final Construction Management Plan and final Construction Traffic Management Plan).
- Construction vehicles shall not be permitted to park or wait on public roads outside the site boundary.

- All construction access roads shall be kept clean and a maintenance plan for same, shall be agreed with SDCC.
- Prior to commencement, an independent Environmental Monitoring Officer (EMO) shall be appointed to monitor any environmental impacts during construction. The EMO shall report to the Planning Authority and shall maintain communication with the Applicant, contractors, local community and other relevant stakeholders.

The level of construction traffic will vary over the course of the construction project. The following section presents the projected volume of traffic generated during the peak construction activity. The construction works will generate traffic from the following activities;

- The delivery of construction materials;
- Staff trips; and
- Site visitors and unscheduled deliveries.

While HGV deliveries will be limited during peak traffic periods, to ensure a robust assessment, 20% of daily movements of HGV traffic are considered to occur during the peak hour periods. Similarly, 20% of staff trips, site visitors, and unscheduled deliveries are robustly assumed to occur during each of the morning and evening peak periods.

13.6.8 Construction Traffic Distribution

As with the operational traffic distribution, it is assumed that travel patterns will follow existing patterns as detailed within Figures 13-7 and 13-8.

13.7 Operational - Traffic Impact

13.7.1 Trip Generation

Normally, trip generation factors from the Trip Rate Information Computer System (TRICS) database would be used to predict the trip generation to and from the Proposed Development, for both the AM and PM peak hour periods. The TRICS database, compiled and maintained by a consortium of County Councils in southern England, comprises records of arrival and departure traffic surveys at a wide range of residential, commercial, and other sites across Great Britain and Ireland.

However, the TRICS database contains no information on media parks such as the one proposed for the Grange Castle site.

Therefore, the trip generation estimates for the site were derived from first principles based on the experience of the applicants and their knowledge of the required labor.
Table 13-8 details the estimated number of workers present on site during the working day and during the night shift:

	Grange Castle Media Park	PRELIMINARY PERSONNEL / STAFF POPULATION COUNT FOR PURPOSE OF TRANSPORT AND DRAINAGE						
	Update 25.10.23			GFA ft²	GFA m²	Classification	Occupancy Day Shift	Night Shift
	WELCOME CENTER			5,000	465	Office	Included	Included
	CAFÉ			3,350	311	Restaurrant	6	2
	GATE HOUSEs			3,300	307	Admin Security	6	2
	WORKSHOP A			50,150	4,659		included	included
	WORKSHOP B			50,150	4,659		included	included
	WORKSHOP C/VENDOR			50,150	4,659		included	included
	WORKSHOP D			50,150	4,659		included	included
Sound Stages	STAGE 1 Live with Dock Support			40,700	3,781		75	10
	Office			15,640	1,453			
	STAGE 2 Live with Dock Support			23,000	2,137		75	10
	Office			15,640	1,453			
	STAGE 3 Live with Dock Support			23,000	2,137		75	10
	Office (included with 2)							
	STAGE 4			25,772	2,394		90	10
	Office			15,640	1,453			
	STAGE 5			25,616	2,380		90	
	Office			24,776	2,302			
	STAGE 6			25,616	2,380		90	
	Office (Included with 5)							
	STAGE 7			15,500	1,440		60	
	Office			18,924	1,758			
	STAGE 8			15,500	1,440		60	
	Office (Included with 7)							
	STAGE 9			15,500	1,440		60	
	Office (Included with 9)							
	STAGE 10			15,500	1,440		60	
	Office (Included with 10)							
	STAGE 11			20,617	1,915		60	
	Office			24,776	2,302			
TV Stages	STAGE 12			20,617	1,915		80	
	Office (Included with 12)							
	STAGE 13			41,035	3,812		80	
	Office			24,776	2,302			
	TV STUDIO			20,000	1,858		80	
	Office (incuded)							
	SUB-TOTAL STAGES	207,740	320					
	SUB-TOTAL OFFICES	99756	348					
	Comissary, Office, & 75 seat Theater			60,000	5,574		150	2
	Vendor Warhouse and Parking Area			54,047	5,021		10	2
	OFFICE @ PARKING DECK			26,750	2,485	Admin Security	8	2
	PRODUCTION SUITES	3No x 2800		8400	780	Enterprise and Em	50	20
				829,591	77,071		1,265	70
						Total	1,335	
	Additional Visitors, meetings, Café / Bar				100			
	Audience Figures. Occassional allow average 200 / day				200			
1	Maintenance / Service Staff							

Enterprise and Emplyment

Table 13-8: Estimate of workers at the proposed development

The revised Mobility Management Plan (MMP) has been compiled on the basis that 62% of workers will arrive by car, reducing to 50% by year 5.

The MMP and TTA originally submitted for this project assumed that 70% of workers will commute by car, and in the interests of making the traffic assessment as robust as possible, this assumption has been maintained, in order to make the analysis conservative and robust.

Thus, on the basis that the proposed development will house a maximum of 1265 No. workers, with 70% arriving by car with a car occupancy of 1.1, plus approximately 100 No. visitor-based car trips, a figure in the region of 905 No. daily inbound vehicle trips is derived and will be used within the following analysis.

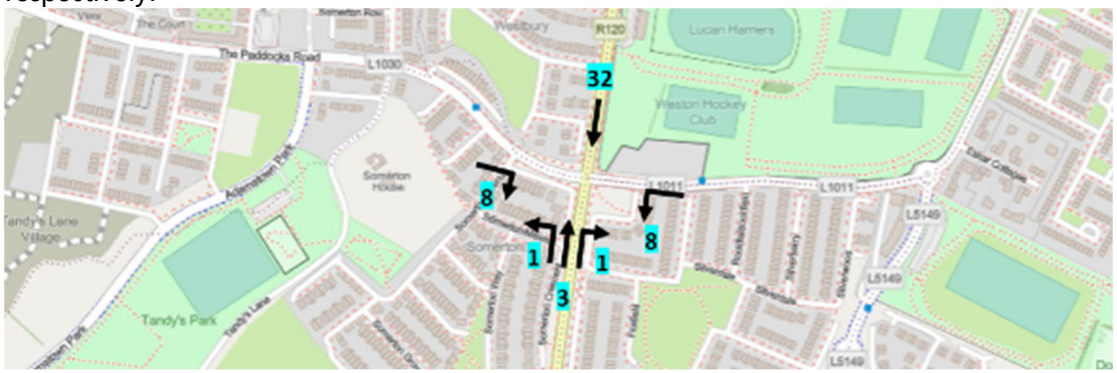
On the basis that 30% of traffic will enter during the 8AM to 9AM period, and exit during the 5PM to 6PM period, with 10% of the estimated figure assumed to travel in the non-peak direction during each of these peak hours, the following flows are derived:

AM Peak Hour (8AM to 9AM)
Entering flow - 905 × 0.3 = 270 PCU
Exiting flow - 27 PCU

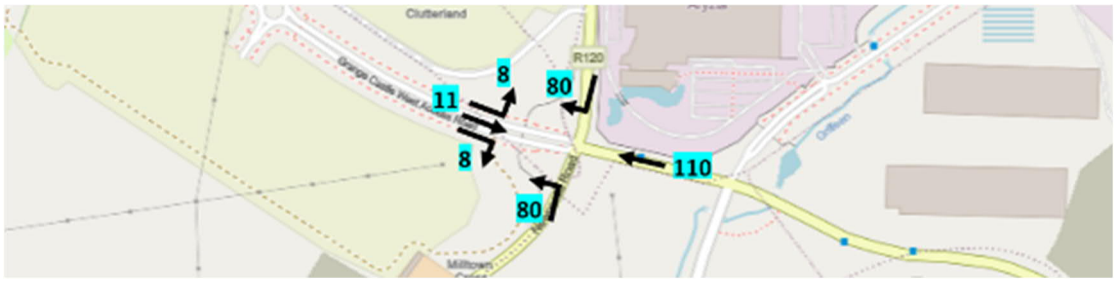
PM Peak Hour (5PM to 6PM)
Entering flow - 27 PCU
Exiting flow - 905 × 0.3 = 270 PCU

13.7.2 Trip Distribution

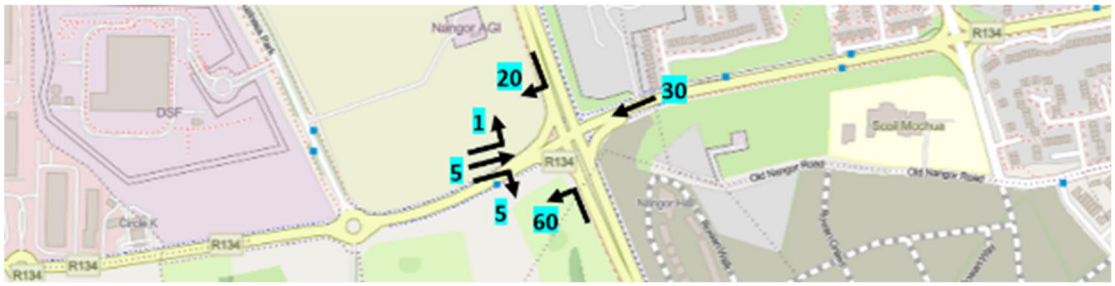
Based on the distribution of existing network flows, the morning and evening peak hour distributions are indicated within Figures 13-9 and 13-10 for the AM and PM peak hours respectively:



JUNCTION 1



JUNCTION 2

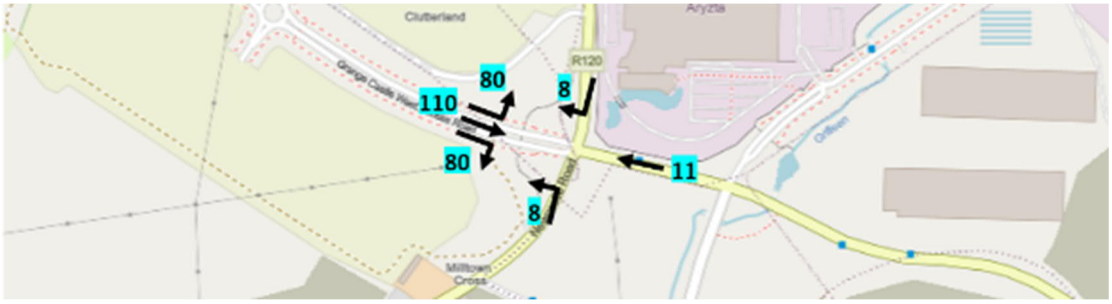


JUNCTION 3

JUNCTION 4

Figure 13-9: AM Peak Generated Flows

JUNCTION 1



JUNCTION 2

JUNCTION 3

JUNCTION 4

Figure 13-10: PM Peak Generated Flows

It should be noted that approximately 40% dissipation of generated flows has been assumed from Junction 1 to and from Junction 2, reflecting the network of intersections between these two locations.

13.7.3 Operational Impact Assessment of proposal

The TII Traffic and Transport Assessment Guidelines (PE-PDV-02045) advise that Transport Assessments should generally be applied where traffic to and from a development is predicted to exceed 10% of the existing background traffic on the adjoining road (or 5% at sensitive locations).

Table 13.9 provides a summary of the percentage impact of the Proposed Development traffic over existing baseline traffic flows at surveyed junctions (shown in Figures 13.7 and 13.8) that are predicted to result from the subject development during its operational phase.

The 2014 Traffic and Transport Assessment Guidelines published by the NRA requires that the relevant junctions be analysed for the existing situation (2023), the year of opening (2026), the design year 1 (year of opening plus 5) with the proposed development

An annual growth rate of 1.7% has been assumed for the period late-2023 to 2030, decreasing to 0.6% for 2031 to 2041, based on the central / medium growth estimate for the Dublin Metropolitan Area, published by TII in 2019 (PE-PAG-02017-2).

The 2026 Do-Nothing ('without development') scenario is derived by factoring the survey results in Figures 1-3 and 1-4 (morning and evening peak hours) up by 5.19% ($(1.017)^3$ - 1 = 0.0519). The 2026 Do-Something ('with development') scenario is derived by adding the development flows detailed in Figures 2-1 and 2-2 to these factored network flows.

The 2031 Do-Nothing ('without development') scenario is derived by factoring the survey results in Figures 1-3 and 1-4 (morning and evening peak hours) up by 13.2% ($(1.017^7 \times (1.006)^1) - 1 = 0.132$). The 2031 Do-Something ('with development') scenario is derived by adding the development flows detailed in Figures 2-1 and 2-2 to these factored network flows.

The 2041 Do-Nothing ('without development') scenario is derived by factoring the survey results in in Figures 1-3 and 1-4 (morning and evening peak hours) up by 20.2% ($(1.017^7 \times (1.006)^{11}) - 1 = 0.202$). The 2041 Do-Something ('with development') scenario is derived by adding the development flows detailed in Figures 2-1 and 2-2 to these factored network flows.

Table 13-4 below details the network and development flows incident on the 4 No. critical junctions on the projected day of opening in 2026, within 2031, 5 years after opening and within 2041, 15 years after opening with the proposed petrol filling station plus campsite in place:

JUNCTION NO. 1	Network Flows		Proposed Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1940	1962	55	55	1995	2017	2.8	2.7
Design Year 1 (2031)	2087	2111	55	55	2142	2166	2.6	2.5
Design Year 2 (2041)	2216	2241	55	55	2271	2296	2.4	2.4
JUNCTION NO. 2	Network Flows		Proposed Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1722	1719	302	302	2024	2021	14.9	14.9
Design Year 1 (2031)	1853	1850	302	302	2155	2152	14.0	14.0
Design Year 2 (2041)	1967	1964	302	302	2269	2266	13.3	13.3
JUNCTION NO. 3	Network Flows		Proposed Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	3785	4192	121	121	3906	4313	3.1	2.8
Design Year 1 (2031)	4074	4511	121	121	4195	4632	2.9	2.6
Design Year 2 (2041)	4325	4789	121	121	4446	4910	2.7	2.5
JUNCTION NO. 4	Network Flows		Proposed Development flows		Total flows		Development flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1339	1436	88	88	1427	1524	6.2	5.8
Design Year 1 (2031)	1441	1546	88	88	1529	1634	5.8	5.4
Design Year 2 (2041)	1529	1641	88	88	1617	1729	5.4	5.1

Table 13-9: Network and development flows at development access junction on day of opening (2026), Design Year 1 (2031) and Design Year 2 (2041)

The 2014 Traffic and Transport Assessment Guidelines requires the impact of the additional traffic volumes on the critical nearby junctions to be assessed in detail if:

- Development flows exceed 10% of existing turning movements at the two relevant junctions;
- Development flows exceed 5% of turning movements if the location has the potential to become congested.

It is noted that the 10% threshold is exceeded at the development entrance (No. 2), due in the main to the very low network flows.

At junction No 4, the lower threshold is just exceeded.

These two junctions will be analysed in detail.

Analysis of flows from adjacent permitted developments

As part of a robust analysis, A search for developments that have been granted planning permission since 2021 within the area of influence of the proposed Grange Castle Medial Park (GCMP) was conducted to provide a comprehensive traffic assessment.

Details of 14 developments within the area of influence of the proposed development are given below within Figure 13-11:

Figure 13-11: Location of permitted developments in the vicinity of the proposed GCMP

Table 13-10 below summarises the permitted developments in the vicinity of the proposed development:

No.	• Permitted Planning Application Description	• Planning Reference No.	Opening Year
1	205 Residential Units (Quintain Developments Ireland Limited)	SDZ23A/0012 •	Unknown
2	Battery Energy System Storage (BESS) & Power Trunk building (Data & Power Hub Services Ltd.)	SD23A/0012	• 2025
3	Class 9 Residential Training Centre (Newview Education Ltd.)	SDZ23A/0011	• N/A
4	Biopharmaceutical Manufacturing Facility (Pfizer Ireland Pharmaceuticals)	SD23A/0123	• 2028
5	Peaker Power Plant (Grange Backup Power Ltd.)	SD23A/0079	Unknown
6	Storage of fuel within existing tanks (Microsoft Operations Ireland Ltd.)	SD23A/0039	• N/A
7	436 Residential Units (Quintain Developments Ireland Limited)	SDZ22A/0005	Unknown
8	423 Residential Units (Adamstown Station & Boulevard Ltd.)	SDZ22A/0007	Unknown
9	Change of use from existing four-storey office building to a Health Centre (Quintain Developments Ireland Limited)	SDZ22A/0012	Unknown
10	Volatile Organic Compound (VOC) Abatement System (Takeda Ireland Limited)	SD22A/0303	Unknown
11	Amendment to Electrical Substation Compound (EdgeConnex Ireland Limited)	SD22A/0105	Unknown
12	Temporary Gas Powered Generation Plant (EdgeConnex Ireland Limited)	SD22A/0025	• N/A
13	Two-storey extension to existing Engineering Stores and Admin Office Building (Takeda Ireland Limited)	SDZ20A/0021	Unknown
14	Two single-storey Data Centres with associated office and service areas and three Gas Powered Generation Plant buildings (EdgeConnex Ireland Limited)	SD21A/0042	Unknown

Table 13-10: Summary of permitted developments in the vicinity of the proposed development

4 No. of the above sites were considered relevant to this analysis, based both on the volume of flows generated and their proximity to the local road network impacted by the proposed development at Grange Castle.

The 4 No. sites were as follows:

- Site 1
- Site 2
- Site 11
- Site 14

Figures 13-12 and 13-13 detail the combined AM and PM peak flows from all four sites at the 4 No. relevant junctions.

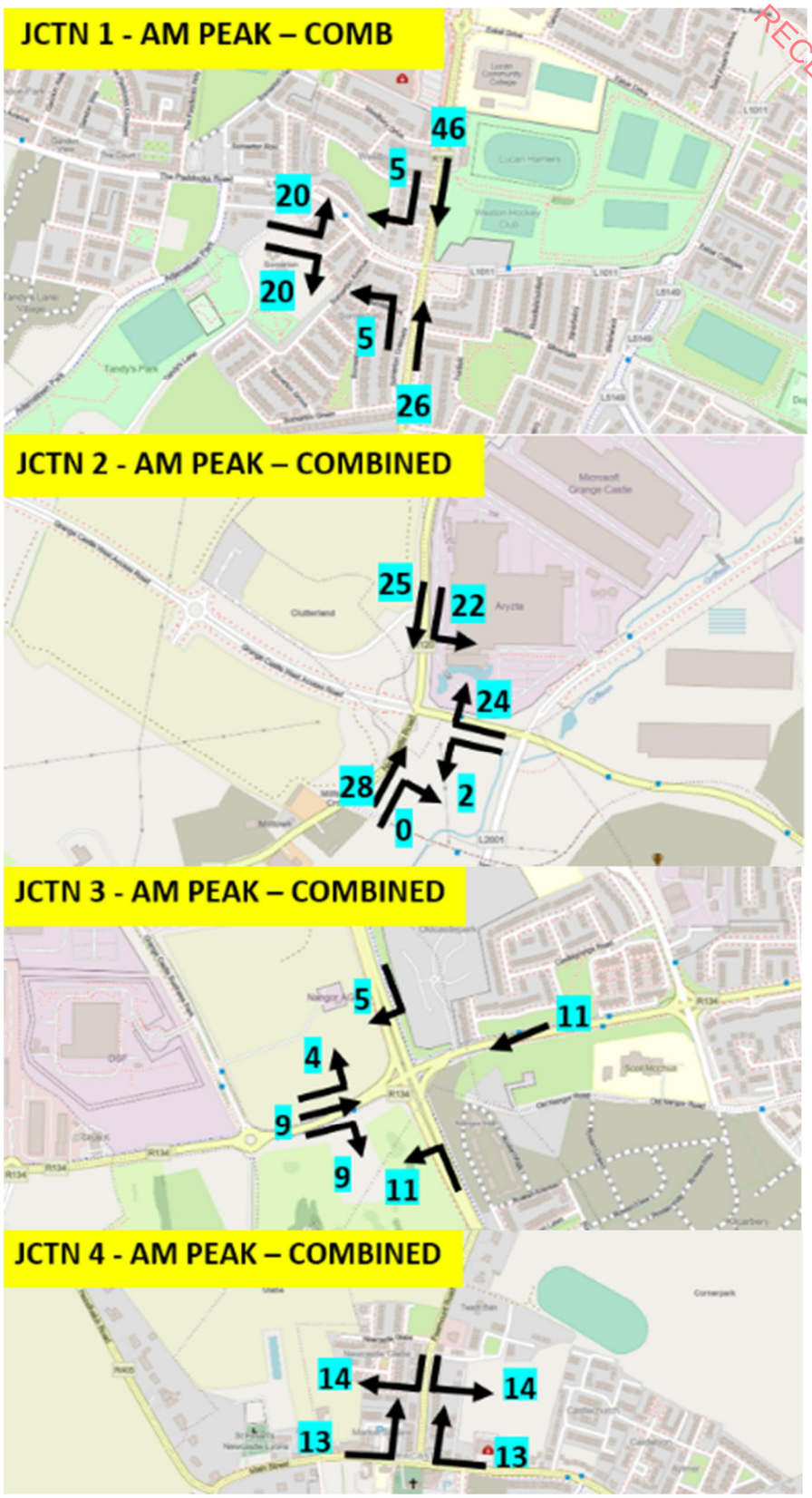


Figure 13-12: AM Peak Flows at 4 No. critical junctions due to combined flows

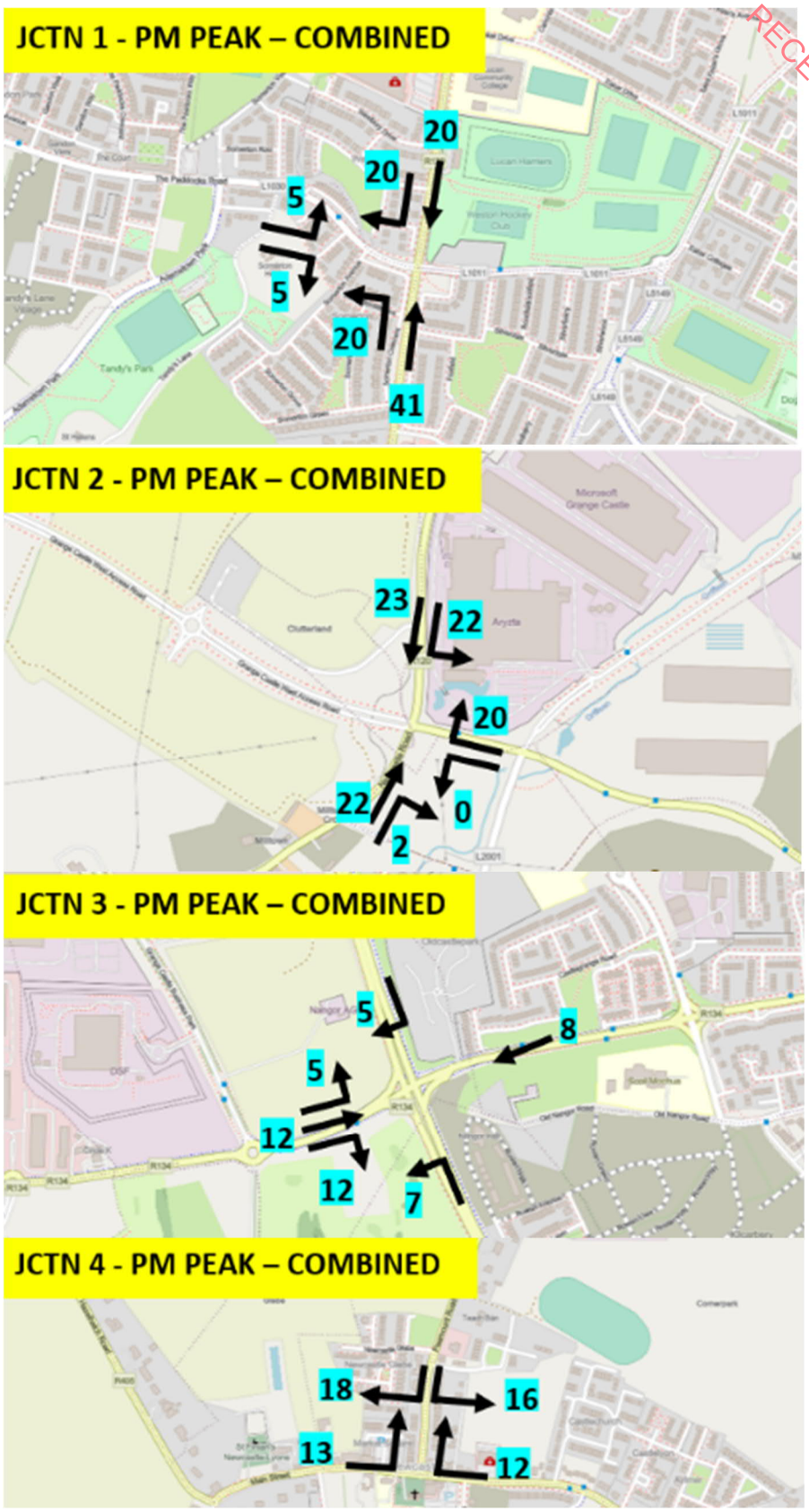


Figure 13-13: PM Peak Flows at 4 No. critical junctions due to combined flows

The following are the 2-way AM and PM peak flows predicted at the 4 No. junctions for 100% of the combined flows from permitted adjacent development, detailed in Table 13-11:

JUNCTION NO. 1	Network Flows	
	AM	PM
100% Combined flows	122	101
JUNCTION NO. 2	Network Flows	
	AM	PM
100% Combined flows	101	99
JUNCTION NO. 3	Network Flows	
	AM	PM
100% Combined flows	49	49
JUNCTION NO. 4	Network Flows	
	AM	PM
100% Combined flows	54	59

Table 13-11: Flows generated by adjacent permitted developments on 4 No. junctions

On the basis that 25% of the adjacent permitted flows are in place by 2026, 50% by 2031 and 100% by 2041, Table 13-12 details the impact of these flows on the 4 No. junctions:

JUNCTION NO. 1	Network Flows		Adjacent Development flows		Total flows		Adjacent Dev flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1940	1962	31	25	1971	1987	1.5	1.3
Design Year 1 (2031)	2087	2111	61	51	2148	2162	2.8	2.3
Design Year 2 (2041)	2216	2241	122	101	2338	2342	5.2	4.3
JUNCTION NO. 2	Network Flows		Adjacent Development flows		Total flows		Adjacent Dev flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1722	1719	25	25	1747	1744	1.4	1.4
Design Year 1 (2031)	1853	1850	51	50	1904	1900	2.7	2.6
Design Year 2 (2041)	1967	1964	101	99	2068	2063	4.9	4.8
JUNCTION NO. 3	Network Flows		Adjacent Development flows		Total flows		Adjacent Dev flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	3785	4192	12	12	3797	4204	0.3	0.3
Design Year 1 (2031)	4074	4511	25	25	4099	4536	0.6	0.5
Design Year 2 (2041)	4325	4789	49	49	4374	4838	1.1	1.0
JUNCTION NO. 4	Network Flows		Adjacent Development flows		Total flows		Adjacent Dev flows as % of total flows	
	AM	PM	AM	PM	AM	PM	AM	PM
Day of opening (2026)	1339	1436	14	15	1353	1451	1.0	1.0
Design Year 1 (2031)	1441	1546	27	30	1468	1576	1.8	1.9
Design Year 2 (2041)	1529	1641	54	59	1583	1700	3.4	3.5

Table 13-12: Network and adjacent permitted development flows at development access junction on day of opening (2026), Design Year 1 (2031) and Design Year 2 (2041)

The above Table indicates that the adjacent permitted development will have a very limited impact on the 4 No. junctions analysed within this report.

Again, the biggest impact is incident on Junctions 2 and 4. While flows at Junction 1 are predicted to increase by 5% by 2041, the proposed development at Grange Castle has been demonstrated to have a practically imperceptible impact on this junction.

The adjacent permitted development is predicted to have an imperceptible impact on Junction 3.

The detailed analysis of Junction No. 2 and 4 within Section 3 will include scenarios where the adjacent permitted development flows as detailed within Table 2-5 are fully considered.

TRAFFIC IMPACT OF PROPOSAL ON 2 NO. CRITICAL JUNCTIONS

Introduction

The traffic analysis at all four junctions will analyse the performance of the junctions for the following 10 No. scenarios:

- Existing flows (2023) (Junction 4 only)
- 2026 flows without proposed development in place (AM and PM peak) - 2026 WOD (Junction 4 only)
- 2026 flows with proposed development in place (AM and PM peak) - 2026 WDEV
- 2026 flows with proposed and 25% adjacent permitted development in place 2026 WDEV+
- 2031 flows without proposed development in place (AM and PM peak) - 2031 WOD (Junction 4 only)
- 2031 flows with proposed development in place (AM and PM peak) - 2031 WDEV
- 2031 flows with proposed and 50% adjacent permitted development in place 2026 WDEV+
- 2041 flows without proposed development in place (AM and PM peak) - 2041 WOD (Junction 4 only)
- 2041 flows with proposed development in place (AM and PM peak) - 2041 WDEV
- 2041 flows with proposed and full adjacent permitted development in place 2026 WDEV+

The PICADY and ARCADY programmes from the TRL Junctions 10 Suite will be used to analyse the junction for all scenarios at both junctions.

Detailed analysis of 2 No. junctions - Analysis of AM and PM peak hour flows for 10 No. scenarios

Table 13-13 immediately below summarises the critical flows, capacities, RFC's and queue lengths for the morning and evening peaks for each of the 7 No. scenarios for the 4 No. critical junctions:

JUNCTION NO. 2	WITHOUT DEVELOPMENT			WITH PROPOSED DEVELOPMENT FLOWS			WITH PROPOSED DEVELOPMENT + PERMITTED FLOWS		
	MAX RFC	QUEUE (VEH)	DELAY (SECS)	MAX RFC	QUEUE (VEH)	DELAY (SEC)	MAX RFC	QUEUE (VEH)	DELAY (SEC)
AM 2026	-	-	-	0.69	6	29	0.70	6	29
PM 2026	-	-	-	0.85	7	45	0.86	8	46
AM 2031	-	-	-	0.74	7	31	0.76	7	32
PM 2031	-	-	-	0.92	9	57	0.93	10	61
AM 2041	-	-	-	0.78	7	34	0.82	8	36
PM 2041	-	-	-	0.97	12	75	1.00	15	88
JUNCTION NO. 4	WITHOUT DEVELOPMENT			WITH PROPOSED DEVELOPMENT FLOWS			WITH PROPOSED DEVELOPMENT + PERMITTED FLOWS		
	MAX RFC	QUEUE (VEH)	DELAY (SECS)	MAX RFC	QUEUE (VEH)	DELAY (SEC)	MAX RFC	QUEUE (VEH)	DELAY (SEC)
AM 2023	0.35	1	12	-	-	-	-	-	-
PM 2023	0.68	2	36	-	-	-	-	-	-
AM 2026	0.40	1	13	0.48	2	14	0.48	2	22
PM 2026	0.75	3	43	0.87	5	72	0.88	6	78
AM 2031	0.45	1	22	0.53	2	13	0.55	2	17
PM 2031	0.85	4	65	0.97	9	125	1.02	12	158
AM 2041	0.49	2	25	0.59	2	29	0.63	3	33
PM 2041	0.95	7	110	1.06	14	192	1.16	24	302

Table 13-13: Critical ratios of flow to capacity, queue lengths and delays at 2 No. critical junctions for all scenarios

Conclusions from analysis

Based on the data and evaluations within this TTA, the following conclusions can be made:

1. The Development Entrance signalized junction (Junction No. 2) at present operates within capacity, and will continue to do so with the proposed development in place. Queuing and delays are at low levels, with a minimum of 14% space capacity predicted to exist in 2026 with all predicted development in place. By 2041 with all predicted development in place this junction will be at capacity.

2. The Peamount Road priority junction (Junction No. 4) at present operates within capacity, and will continue to do so with the proposed development in place. Queuing and delays are at low levels, with a minimum of 12% space capacity predicted to exist in 2026 with all predicted development in place. By 2031 with all predicted development in place this junction will be at capacity. By 2041, the junction would be over capacity, assuming the network flow increases utilized have actually materialized.

The above analysis includes scenarios 4, 7 and 10, analysing cumulative impact for different time frames:

- the day of opening in 2026, with the proposed development and relevant permitted adjacent development in place,
- in 2031 (design year 1), with the proposed development and relevant permitted adjacent development in place, and
- in 2041 (design year 2), with the proposed development and relevant permitted adjacent development in place.

13.8 Infrastructure Proposals - Future Baseline

Having reviewed the transport appraisal for the area, the following committed infrastructure proposals within proximity to the Proposed Development will have considerable positive impact on the proposed development.

13.8.1 Proposed Bus Infrastructure

The Bus Connects network is to be introduced on a phased basis over the coming years. This phase involves services in the West/South West of Dublin, serving areas including Grange Castle.

Some of the many benefits of BusConnects include:

- Increased capacity and frequency;
- Increased all day, night-time and weekend services; and
- Improved ticketing to permit free interchange between services.

The plan involves the introduction of the W4 Orbital Route, running from The Square in Tallaght to Blanchardstown Shopping Centre every 30 minutes during the morning weekday peak hour (W4 has been introduced already).

The C1 and D1 spines run close to the site. The C-spine runs from Adamstown to Sandymount every 8 minutes during the weekday morning peak hour and the D-spine from Clongriffin to Grange Castle every 15 minutes during the weekday morning peak hour (see Figure 13-14).

Figure 13-14: Bus Connects proposals close to subject site

Shuttle Bus

In order to increase the modal splits for public transport, a shuttle bus service is proposed to improve access to both rail and bus services.

The number of commuters arriving at the morning by public transport on the day of opening is projected to be as follows:

1265 × 0.18 = 228 No. workers (based on the 18% model split predicted for public transport on the day of opening of the proposed development).

Assuming all arrive within a 2-hour period, this equates to 114 No. of arrivals per hour.

Thus, a medium sized bus operating continually, capable of carrying 20 to 30 commuters, will more than suffice, delivering workers to the site every 15 minutes at peak times.

The route of the bus will extend from the site northwards towards the Adamstown Rail Station, and eastwards towards the 13 and 68 Bus Routes running along the R120 / R134 road links, providing direct, quick and efficient access to local rail and bus links.

13.8.2 Proposed Cycling Infrastructure

Figure 13-15 details the cycle network proposals for the Grange Castle Business Park area:

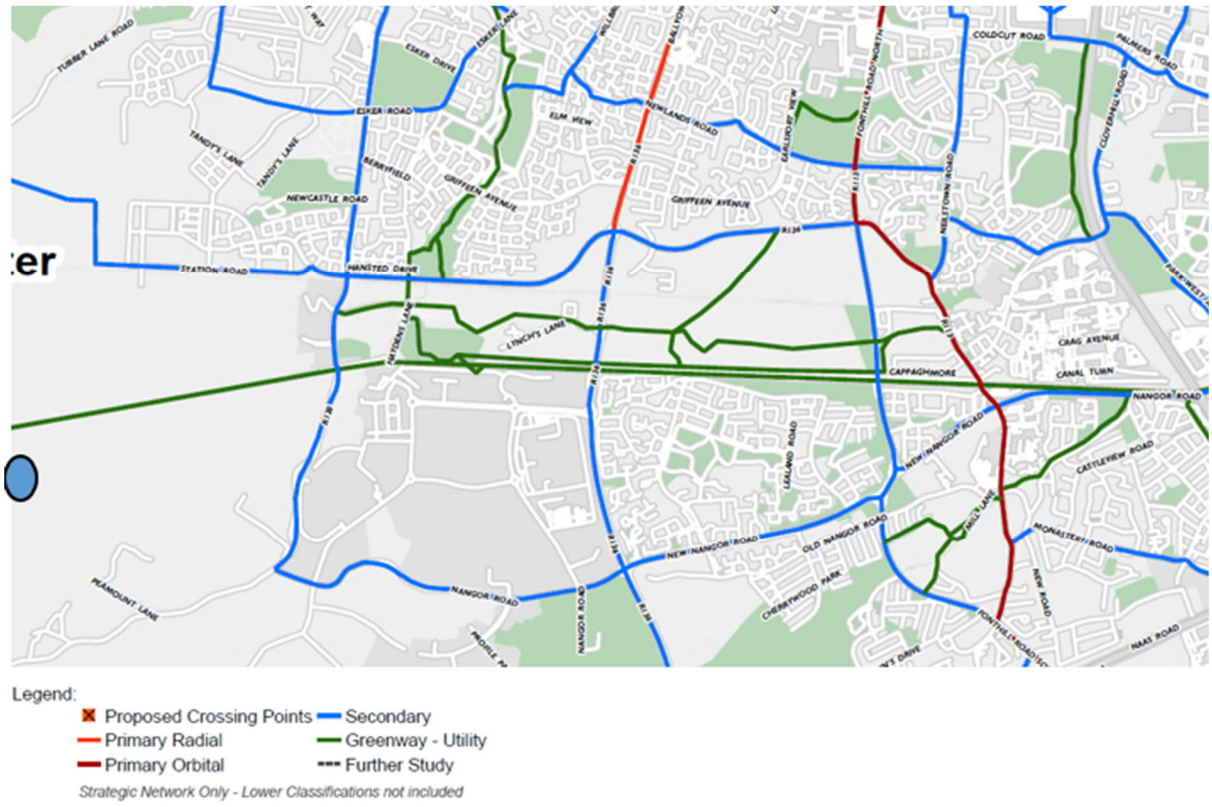


Figure 13-15: proposed cycle network close to site of proposed development

A secondary route along the R120 is planned, running north-south before connected up to the Nangor Road and onto the existing route along the R136.

Also, The Camac River Greenway branch from the Grand Canal through Clondalkin Village to Corkagh Park and City West is also proposed.

13.9 Characteristics of the Proposed Development

13.9.1 Development Schedule

The development is located in the townlands of Coolscudden, Brownstown and Milltown, west of Grange Castle Business Park, Newcastle, County Dublin.

The site is bounded by the Grand Canal to the north.

The proposed development will include the construction of:

- 6 no. studio/sound stage buildings (ranging between 2,950 sq. m and 3,832 sq. m gfa and totalling c. 22,200 sq. m gfa) comprising internal double height stages with

overhead catwalks, 2-storey ancillary production offices including office space, plant and switch rooms, toilets, ICT rooms and staff toilets (c. 35,131 sq. m);

- 4 no. single storey workshop buildings (c. 18,240 sq. m) comprising internal workshop areas, staff toilets and showers, ICT, plant and switch rooms;
- 3-storey TV studio and welcome centre building (c.10,984 sq. m) comprising 3 no. TV studios and various supporting spaces at Ground Floor level including backstage shooting area, green rooms, hair and makeup rooms, production suites with ancillary offices, wardrobe, laundry room, vision dept, lighting dept, pro service, run and crew kit room, chief engineer office, studio manager office, scenic store, prop store, camera and grip room, lighting and electrical room, plant room, mechanical room, sound control rooms, vision rooms, recording rooms, guest holding areas, security offices, staff toilets and locker rooms; First Floor level to include standard dressing rooms, TV post production rooms, kitchen and crew area, toilets, mechanical/electrical room, technical offices, media store; Second Floor level to include star dressing rooms, toilets, TV post production rooms and outdoor balcony;
- no. outdoor stage areas associated with the TV Studio and Welcome Centre;
- Dining Hall with ancillary theatre (c. 4,363 sq. m) comprising indoor and outdoor dining areas, kitchen, storage and mechanical rooms, toilets, 3 no. meeting rooms and a theatre;
- Standalone café (c. 94 sq. m)
- no. single storey production suite buildings (c.769 sq. m) comprising offices, conference room, kitchenette, communal areas and toilets;

13.9.2 Site Access Arrangements

The primary proposed vehicular, cyclist and pedestrian entrance will be located at the eastern boundary, at the junction of the R120 and the R134, with a secondary vehicular access at the southeastern corner of the site (see Figure 13-16).

Figure 13-16 –Site at Grange Castle Business Park and main access at eastern boundary

All connections between the development's internal road network and the existing external road network have been designed in accordance with the requirements of the Design Manual for Urban Roads and Streets (DMURS) and Poolbeg SDZ Planning Scheme 2019.

13.9.5 Car Parking

The Proposed Development shall include a total of 792 no. car parking spaces.

13.9.6 Bicycle Parking

A total of 404 no. bicycle parking spaces shall be provided within the development.

13.10 Mitigation Measures

13.10.1 Construction Phase

General Construction Traffic Strategy

Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing local road network and residential areas to a minimum. To minimise disruption to the local areas, construction traffic volumes will be managed through the following measures:

- During peak hours, ancillary, maintenance and other site vehicle movements will be discouraged.
- Daily construction programmes will be planned to minimise the number of disruptions to surrounding streets by staggering HGV movements to avoid site queues.
- Construction vehicle access routes will be restricted to/from the M50 via the R120 / R134, thus minimising impact to residential communities.
- All existing roads will remain open to general traffic through all stages of the construction.
- At pre-commencement stage, the Applicant shall provide a Community Liaison Plan (alongside a final Construction Management Plan).
- Construction vehicles shall not be permitted to park or wait on public roads outside the site boundary.
- All construction access roads shall be kept clean and a maintenance plan for same, shall be agreed with SDCC.
- Prior to commencement, an independent Environmental Monitoring Officer (EMO) shall be appointed to monitor any environmental impacts during construction. The EMO shall report to the Planning Authority and shall maintain communication with the Applicant, contractors, local community and other relevant stakeholders.

Pedestrian Safety

Deliveries will be scheduled outside of peak traffic hours, to avoid disturbance to pedestrian traffic in the vicinity of the site.

Hours of Working

Working hours shall be agreed with SDCC prior to commencement of construction works.

Construction Traffic Management Plan

A detailed Construction Traffic Management Plan (CTMP) will be developed by the Contractor and presented to SDCC for approval prior to commencement of the construction works. The CTMP will contain detailed temporary traffic management drawings for each construction stage and will include the mitigation measures described in this section. Please refer to Outline Construction and Environmental management Plan prepared by Verde and submitted with this application for further details of proposed traffic management measures.

13.10.2 Operational Phase

The development shall incorporate several design and management elements intended to mitigate the impact of the development on the surrounding road network during its operational phase. These include:

- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both development occupants and visitors; and
- promotion of sustainable transport modes such as walking, cycling and public transport use.
- Provision of a shuttle bus connecting the site with major rail and bus routes to minimise journey times and thus maximise use of public transport links available locally.

As described in the Mobility Management Plan document prepared in support of this planning application, a Mobility Management Plan Coordinator shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Mobility Management. This shall assist development occupants and visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys to and from the development site where possible.

13.11 Residual Impacts

13.11.1 Construction Phase

No notable residual traffic impacts arising from the construction activities have been identified and shall therefore remain the same – Imperceptible impact.

13.11.2 Operational Phase

No notable residual traffic impacts arising from the operational phase activities have been identified due to the low-level vehicle impact assessment and shall therefore remain the same – Imperceptible impact.

13.12 Interactions Arising

The traffic activity associated with the proposed scheme constitutes an input to the Air Quality and Noise chapters (Chapters 9 and 10 respectively) of this EIAR.

The moderate vehicular traffic flows that shall be generated by the Proposed Development may result in corresponding changes to air quality and noise levels in the vicinity of the surrounding road network. The nature and extent of these changes are examined in the relevant Chapters of this EIAR document.

13.13 Monitoring

13.13.1 Construction Phase

The construction phase should be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the Construction Traffic Management Plan (CTMP).

13.13.2 Operational Phase

As described in the accompanying Mobility Management Plan (MMP) document, a Mobility Management Plan Coordinator (MMPC) shall be appointed for the Proposed Development, with the remit to implement and oversee an ongoing MMP. In conjunction with this, the MMPC will be responsible for monitoring the travel habits of development occupants and visitors.

The MMP is a dynamic process whereby a package of measures and campaigns is identified, piloted, and then monitored on an ongoing basis. The MMP will identify specific targets against which the effectiveness of the plan can be assessed at each review; these will typically take the form of target modal splits for journeys to and from a site. The MMP Coordinator will gather data on travel patterns, for instance by conducting periodic travel surveys of development occupants.

13.14 Cumulative Construction Impacts

As construction related traffic is minor relative to the volumes at operational scale, the cumulative impacts of these are not seen as significant

13.15 Cumulative Operational Impacts

The cumulative impacts of the proposal during its operational phase has been fully analysed within scenarios 4, 7 and 10 of the operational phase traffic analysis detailed earlier, taking into consideration the impact both of the traffic from the proposed development and the 4 No. adjacent permitted developments deemed relevant to the analysis due to their proximity to the local road network of interest.

13.16 Difficulties Encountered

No significant difficulties were experienced in compiling this chapter of this EIAR;

13.17 References

National Cycle Policy Framework 2009, Department of Transport
The National Cycle Policy Framework NCPF sets out a national policy for cycling to create a stronger cycling culture and a friendlier environment for cyclists.

Regional Spatial and Economic Strategy (Eastern and Midland Regional Assembly, 2019)
This document notes the trends within the Region that indicate an overreliance on the private car for travel to work and education, stating that approximately 46% of Dublin's population commute by private car. Regional Planning Objective 8.7 within this document aims to promote the use of mobility management and travel plans to bring about behaviour change and more sustainable transport use.

Effective Workplace Travel Plans, 2012, NTA
This guidance aims to assist local authorities in fully integrating the principles and practice of Workplace Travel Plans into both the development plan process and the development management process. The principle that underpins sustainable.

Dublin City Centre Transport Study 2023
The City Centre Transport Plan identifies policies and projects that will assist in the implementation of the transport policies and objectives of the Dublin City Development Plan, within the City Centre area. Importantly, the plan outcomes also support the delivery of a myriad of other Development Plan policies, including improving air quality, reducing the impacts of noise, and protecting the built heritage. In particular, the City Centre Transport Plan frames the implementation of the following Development Plan Sustainable Mobility and Transport policies, and their associated objectives:

- SMT1 – Modal Shift and Compact Growth
- SMT2 – Decarbonising Transport
- SMT3 – Integrated Transport Network
- SMT8 – Public Realm Enhancements
- SMT11 – Pedestrian Network
- SMT12 – Pedestrians and Public Realm
- SMT14 – City Centre Road Space
- SMT15 – Last Mile Delivery
- SMT16 – Walking, Cycling and Active Travel
- SMT18 – The Pedestrian Environment
- SMT22 – Key Sustainable Transport Projects
- SMT25 – On-Street Parking
- SMT28 – Repurposing of Multi-Storey Car Parks

Taken together, these policies give clear direction in terms of land use development and management of all transport modes in the City Centre. Notably, there is clear direction from the Development Plan that vehicular traffic in the City Centre needs to be managed. This is accompanied by a renewed emphasis on the need to better provide for higher capacity sustainable modes of travel, active travel and to more efficiently service the diversity of business, commercial and cultural activities within the city.

South Dublin Development Plan 2022-2028
The South Dublin Development Plan states that the planning authority shall require all planning applications for large employment based developments to include a Mobility Management Plan. Developments for which mobility management could include people intensive employment developments such as office-based industrial.

The Development Plan states the aim of the mobility management plan is to shift the emphasis from car borne commuting to increased use of sustainable transportation modes.

Section 13.7.3 states that a Workplace Travel Plan or Mobility Management Plan is required in order to encourage sustainable travel modes and reduce car borne traffic within a development. Initiatives might include proposals to encourage cycling and walking, car sharing (including car clubs), car-pooling,

flexible working hours, cycling and public transport use. The National Transport Authority (NTA) guidelines on Achieving Effective Workplace Travel Plans - Guidance for Local Authorities sates that 'International experience has shown that a methodical and planned approach to targeting commuting and visitor patterns at an organisational level, can pay major dividends in terms of promoting sustainable travel'.

The Development Plan states that Workplace Travel Plans are required for larger sized developments as defined in Table 13.26. All Workplace Travel Plans are required to be prepared in accordance with the NTAs Achieving Effective Workplace Travel Plans.

Table 13.26 states that industrial developments larger than 6000 m^2 GFA and with more than 100 No. employees require a full mobility plan.

Transportation Strategy for the Greater Dublin Area 2022-2042 (NTA, 2022)
This document states that development within the existing urban footprint of the Metropolitan Area should be consolidated to achieve a more compact urban form. Policy should allow for the accommodation of a greater population than at present, with much-enhanced public transport system, with the expansion of the built up areas providing for well-designed urban environments linked to high quality public transport networks, enhancing the quality of life for both residents and workers.

In the 2022 to 2030 timeframe, this strategy aims to implement the BusConnects core bus corridors, the proposed extension to the DART, the LUAS Green Line Upgrade, the GDA cycle network and certain city centre management measures. In the period beyond 2030, LUAS extensions to Finglas, Lucan, Bray and Poolbeg are envisaged, in addition to DART extensions, the Navan Rail line and additional core bus corridors.

The overall aim of the strategy is to provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth.

The Travel Plan within this report demonstrates the proximity of site to significant existing public transport infrastructure, with future public transport provisions such as Bus Connects scheme improving overall levels of public transport provision within the locality into the future, enhancing public transport options for staff and visitors at the development.

National Cycle Manual, 2011, NTA
The National Cycle Manual, adopted in 2011, provides local guidelines on cycle parking provision.

National Transport Authority's Greater Dublin Area Cycle Network Plan (2013)
Sets out proposed primary and secondary radial cycle routes within the GDA, in addition to a network of orbital routes.

The Chartered Institution of Highways and Transportation (1994): Guidelines for Traffic Impact Assessments.

Outlines thresholds for traffic impacts requiring detailed assessment

14.0 MATERIAL ASSETS – SITE SERVICES

14.1 Introduction

This chapter of the EIAR has been prepared by Barrett Mahony Consulting Engineers (BMCE) and assesses the likely impact arising during the construction and operational phases of the proposed development on the drainage and water supply material assets as well as identifying proposed mitigation measured to minimise any impacts.

This chapter was prepared by Christina Fox of Barrett Mahony Consulting Engineers (BMCE). Christina is a Chartered Engineer with Engineers Ireland and has been practicing as a consulting engineer for over eleven years. Christina holds and undergraduate degree in Civil Engineering and a master's degree in Structural and Geotechnical Engineering.

The information contained in this chapter should be read in conjunction with the design drawings and reports which accompany this application.

The potential impacts associated with the proposed development, if, any are assessed with regards to the following proposed built services:

1. Potable Water Supply Infrastructure
2. Wastewater Infrastructure
3. Surface Water Drainage Infrastructure

The flow impact from all of the above drainage infrastructure has been covered within Chapter 8: Hydrology.

Summary Development Description

The site area of the proposed Media Park at Grange Castle, Co. Dublin is 22.6 ha. This is referred to as 'the site' and is located within the administrative jurisdiction of South Dublin County Council (SDCC).

Refer to Figure 14.1 below for site location of the proposed media park at Grange Castle, Co. Dublin.

Figure 14.1: Site Location of proposed Media Park at Grange Castle, Co. Dublin.

The site is a greenfield site which is currently used for agriculture and is located west of the Grange Castle Business Park approximately 10km west of Dublin City Centre. The site is bound to the east and south by agricultural lands, to the west by Grange Castle Business Park, and to the north by the Grand Canal.

See Chapter 3 for further details and description of the proposed development. Refer to Figure 14.2 below for aerial view of the site.

Figure 14.2: Aerial view of site at Grange Castle Business Park.

14.2 Methodology

The assessment of the potential impact of the activity on water and hydrology was carried out according to the methodology specified in the following guidance documents:

- Guidelines on the information to be contained in Environmental Impact Statements (EPA 2022)
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA 2015)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (Dept Housing 2018)
- SDCC Development Plan 2022 – 2028
- SDCC Sustainable Drainage Explanatory Design & Evaluation Guide 2022
- The Greater Dublin Strategic Drainage Study (GDSDS)
- The Greater Dublin Regional Code of Practice for Drainage Works
- Uisce Éireann Code of Practice for Water Infrastructure July 2020 (Revision 2)
- Uisce Éireann Code of Practice for Wastewater Infrastructure July 2020 (Revision 2)

Other reference documents used in the preparation of this assessment include the following:

- National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA).

A desktop study was carried out on the local and regional surface water and drainage network. Information was obtained from documents including the following sources:

- Eastern River Basin District (ERBD) Catchment Characterisation Report (ERBDA, 2005)
- ERBD River Basin Management Plan 2009-2015 (ERBDA, 2010a)
- ERBD Programme of Measures 2009-2015 (ERBDA, 2010b)
- ERBD River Basin Management Plan - Strategic Environmental Assessment (ERBDA, 2011)
- EPA online Water Quality Database and Envision Map Viewer (www.epa.ie)
- South Dublin County Council Water and Drainage Department record drawings and discussions with Drainage Division Engineers,
- EPA Report on Drinking Water Quality
- Flood Risk Assessment Report completed by Cronin and Sutton Consulting which accompanies this Planning Application
- All available information concerning the development, this included existing topographical information & relevant utility drawings, as well as a physical site inspection.

Background Information on the local drainage network and water supply was obtained from documents from local authorities and Uisce Éireann with regard to potable water and foul water infrastructure.

As both wastewater and provision of potable water resources are under the control of Uisce Éireann, consultation with them as the appropriate authority is required to ensure that the existing infrastructure has sufficient capacity for the proposed development, or to obtain agreement for any required up-grades to the local infrastructure to allow the development to proceed.

14.3 Consultation

In relation to wastewater and water supply, a pre-connection enquiry application has been submitted to Uisce Éireann (UÉ) and a confirmation of feasibility letter has been received from UÉ. Please see Appendix 14.1.

SDCC have also been consulted with regard to the impact on surface water drainage.

14.4 Receiving Environment

14.4.1 Site Study Area

The subject site is a greenfield site located approximately 10km west of Dublin City Centre adjacent to Grange Castle Business Park.

Figure 14.3: Location of proposed development.

There are no existing water, surface water, or foul sewer connections from the proposed development site.

A new foul sewer network is proposed as part of the permitted Grange Castle West Access Road (planning application reference no. SD188/0009) to the East of the site.

A new watermain is proposed as part of the permitted Grange Castle West Access Road (planning application reference no. SD188/0009) to the East of the site.

The site is a greenfield site and does not contain a surface water network. The Grand Canal runs East-West along the northern boundary of the site. There is also an existing watercourse running South-North approx. 100m West of the site. This existing stream is culverted beneath the Grand Canal.

The Grange Castle West Access Road to the East of the site, contains a 450mm diameter and a 375mm diameter surface water pipeline.

Refer to drawing no. C-11200 for details of the proposed & existing drainage layout.

14.5 Characteristics of the Proposed Development

14.5.1 Foul Water

A new gravity network will serve the proposed development site. A permanent connection is proposed into the proposed foul pipeline permitted as part of the Grange Castle West Access Road (planning application reference no. SD188/0009) to the East of the site.

Due to the development size and the relationship between the levels on site and the invert level of the foul pipe in Grange Castle West Access Road, it will only be possible to discharge foul flows from some of the buildings located to the east of the site by gravity to the foul line on Grange Castle West Access Road. The remainder of the foul flows will be collected in a new internal foul sewer network and discharged by gravity to a pumping station at the western boundary of the site. Foul flows will then be pumped via a rising main to an outfall manhole at the eastern boundary of the site before discharging by gravity to the proposed foul sewer in Grange Castle West Access Road. See drawing C-11200 for details.

Design of the foul sewer network and pumping station will be in accordance with the Uisce Éireann 'Code of Practice for Wastewater' and standard details and the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Wastewater Disposal".

The foul effluent from the proposed buildings is calculated as per the Uisce Éireann Code of Practice for Wastewater Infrastructure (July 2020 (rev. 2)) taking the dry weather flow (DWF) from Appendix C plus a 10% infiltration rate. The site area is approx. 22.67ha, therefore, in accordance with Table 2.7, a peaking factor of 3 is considered.

The number of persons on site will include a mixture of staff permanently based on site and additional persons who will be involved in film production as required. The number of persons on site is broken down as follows:

Restaurant - Occupancy - 8

DWF = 30 l/head/day

Daily Flow = 8 x 30 x 1.1 = 264 l/day

Average Flow = 264 / (60x60x24) = 0.003l/s

Peak Flow = Avg. Flow x 3 = 0.003 x 3 = 0.009l/s

Office/Factory without Canteen - Occupancy - 18

DWF = 50 l/head/day

Daily Flow = 18 x 50 x 1.1 = 990 l/day

Average Flow = 990 / (60x60x24) = 0.011l/s

Peak Flow = Avg. Flow x 3 = 0.011 x 3 = 0.034l/s

Office/Factory with Canteen - Occupancy - 1309

DWF = 100 l/head/day

Daily Flow = 1309 x 100 x 1.1 = 167,090 l/day

Average Flow = 167,090 / (60x60x24) = 1.667l/s

Peak Flow = Avg. Flow x 3 = 1.667 x 3 = 5.000l/s

Non-residential Conference Guest - Occupancy - 300

DWF = 60 l/head/day

Daily Flow = 300 x 60 x 1.1 = 19,800 l/day

Average Flow = 19,800 / (60x60x24) = 0.229l/s

Peak Flow = Avg. Flow x 3 = 0.229 x 3 = 0.688l/s

Total Daily Flow = 264 + 990 + 143,990 + 19,800 = 165,044l/day

Total Peak Flow = 0.009 + 0.034 + 5.000 + 0.688 = 5.731l/s

Total Average Flow = 0.003 + 0.011 + 1.667 + 0.299 = 1.910l/s

Due to the topography of the site, it is intended that the wastewater is collected within a holding tank and then pumped to the main foul sewer which is proposed to serve Grange Castle Business Park West. The holding tank will be adequate to provide 24-hour storage.

The foul sewer serving the Grange Castle Business Park West permitted under planning application reference SD188/0009, has been designed to facilitate this development. An allowance for a peak flow of 20.86 l/s for this site has been made in the design of the business park foul sewer.

14.5.2 Water Supply

The proposed watermain connection to the development will be from the permitted watermain as part of the Grange Castle West Access Road (planning application reference no. SD188/0009) to the East of the site. All proposed water mains will be HDPE 150 SDR17 in accordance with Uisce Éireann Standards.

Hydrants will be provided on the watermain at a max distance of 46m from any part of a building in accordance with the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety". Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with UÉ Code of Practice and Standard Details. Sluice valves will be provided at appropriate locations to facilitate isolation and purging of the system. Air valves will be provided at high points for system venting.

Design of the watermain will be in accordance with the Uisce Éireann 'Code of Practice for Water Supply' and standard details.

The water demand from the proposed development is calculated as per the Uisce Éireann Code of Practice for Water Infrastructure (July 2020 (rev. 2)). The water demand is in accordance with Section 3.28. The average day/peak week demand is taken as 1.25 times the average daily domestic demand. The peak demand factor is taken as 5 times the average day/peak week demand.

The number of persons on site will include a mixture of staff permanently based on site and additional persons who will be involved in film production as required. The number of persons on site is broken down as follows:

Restaurant - Occupancy - 8

Demand = 30 l/head/day

Daily Demand = 8 x 30 x 1.25 = 300 l/day

Average Demand = 300 / (60x60x24) = 0.003l/s

Peak Demand = Avg. Demand x 5 = 0.003 x 5 = 0.017l/s

Office/Factory without Canteen - Occupancy - 18

Demand = 45 l/head/day

Daily Demand = 18 x 45 x 1.25 = 1.013 l/day

Average Demand = 1,013 / (60x60x24) = 0.012l/s

Peak Demand = Avg. Demand x 5 = 0.012 x 5 = 0.059l/s

Office/Factory with Canteen - Occupancy - 1309

Demand = 75 l/head/day

Daily Demand = 1309 x 75 x 1.25 = 122,719 l/day

Average Demand = 122,719 / (60x60x24) = 1.420l/s

Peak Demand = Avg. Demand x 5 = 1.420 x 5 = 7.102l/s

Non-residential Conference Guest - Occupancy - 300

Demand = 60 l/head/day

Daily Demand = 300 x 60 x 1.25 = 22,500 l/day

Average Demand = 22,500 / (60x60x24) = 0.260l/s

Peak Demand = Avg. Demand x 5 = 0.229 x 5 = 1.302l/s

Total Daily Demand = 300 + 1,013 + 122,719 + 22,500 = 146,531l/day

Total Peak Demand = 0.017 + 0.059 + 7.102 + 1.302 = 8.480l/s

Total Average Demand = 0.003 + 0.012 + 1.420 + 0.260 = 1.696l/s

14.5.3 Surface Water

The proposed surface water drainage system is designed to comply with the 'Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document – Volume 2, New Developments, 2005' and the 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005'. CIRIA Design Manuals C753, C697 and C609 have also been used to design the surface water drainage system within the site.

It is proposed to construct a new surface water drainage system for the development to collect runoff from roofs and paved areas and any additional runoff from landscaped areas which doesn't percolate to ground. It is proposed that the new surface water network within the site will convey surface water flows to two swales located within the 50m buffer zone between the proposed development and the Grand Canal to the North of the site.

Surface water flows from the site will outfall to the existing watercourse approx. 100m West of the site. Surface water flows from the site will outfall to the existing watercourse approx. 100m West of the site. This watercourse is culverted beneath the Grand Canal and flows north-west towards the River Liffey. The swales will be designed to accommodate flows for the 1 in 100-year storm event. A hydrobrake will be fitted at the outfall of each swale which will limit the flow exiting the site to the existing greenfield runoff rate QBAR (57.6 l/s).

SuDS measures including green roofs, permeable paving, bio-retention tree pits and rainwater harvesting have also been incorporated. All surface water runoff will pass through at least one SuDS measure prior to discharging from the site. Therefore, minimising the potential for harmful pollutants discharging from the proposed development. Given the SuDS measures included in the design and the low volume of runoff from the developed site, impact on exiting water courses is expected to be minimal. Refer to Chapter 8 Hydrology for further details.

Refer to the engineering infrastructure report and drainage drawings for further details on the proposed drainage and water supply.

14.6 Potential Impact of the Proposed Development

14.6.1 Construction Phase

The contractor's operations will result in the generation of effluent and sanitary waste from facilities provided for the work force on site. The volume potentially generated will vary as the number of construction workers on site will vary as the construction operations on site fluctuate. There will be as many as 700 operatives on site during the construction. The effluent generated during the construction phase is discharged, under a temporary agreement to the foul sewer. As a guide, this would equate to 70m^3/day, with an average flow of 0.8l/sec and a peak flow of 2.4/sec, substantially lower than the predicted effluent volume generated on site upon completion.

The effluent generated during the construction phase will have a slight negative impact on the

existing foul drainage network as the spare hydraulic capacity will be reduced in the public system. The proposed reduction will have the effect that the existing network will not be able to convey the same volume of effluent as if no development was to take place. The effect of increasing the effluent volumes in the existing sewer is that the spare capacity will reduce. Notwithstanding this, the predicted foul effluent to be generated during the construction phase is low and would have a minimal impact on the existing infrastructure. Once the construction works are complete, this temporary effluent discharge will cease and will be replaced by the proposed developments effluent discharge.

The contractors shall require a separate water supply connection for the works. It is expected that the Contractor will require a 150mm temporary connection to the existing potable water network. The impact on the water supply network is likely to be slight negative and short term for the duration of the construction works, as the Contractor will be drawing potable water from the mains and thereby reducing, albeit temporarily the capacity in the public mains.

Any temporary discharge or temporary water supply shall be subject to license.

The construction of the proposed in ground services will require the excavation, removal, and reinstatement of ground. The new development will require new connections to the public water supply and wastewater networks. This may result in temporary disruption of existing services in the vicinity of the development. This disruption if any, will be brief and not significant.

14.6.2 Operational Phase

Uisce Éireann (UÉ) have confirmed the feasibility of the proposed development in terms of water and wastewater capacity via a confirmation of feasibility letter.

The proposed wastewater network for the development has been designed to cater for the quantum of predicted effluent to be generated. The proposed 300mm foul sewer will have a capacity of 72.65l/s based on a 1:300 gradient. The proposed maximum foul loading from the development is estimated to be much less at 5.73l/s.

SDCC have provided endorsement for the proposed surface water drainage proposal.

14.6.3 Do Nothing Scenario

If the proposed works were not implemented, there would be no change in the site's current use and the existing site would remain as a greenfield site with no services.

14.7 Mitigation Measures

14.7.1 Design Phase

All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment.

Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery

operation time. It will be suggested that products and materials are supplied locally, where practicable and available, to reduce carbon footprint of travel and production.

14.7.2 Construction Phase

The following mitigation measures are recommended for the construction phase:

- The contractor is to conduct the works in accordance with all relevant local authority requirements, and health and safety legislation.
- Relevant services providers are to be consulted in advance of works to ensure works are carried out to relevant standards and specifications including procedures to ensure safe working practices are implemented for works in the vicinity of services, such as live gas mains, works in the vicinity of overhead electricity lines and live electricity lines and works to distribution watermains.
- Neighbouring sites are to be advised of construction methodologies in advance of works, in situations which may affect them.
- All retained underground services are to be protected.
- All decommissioned infrastructure will have to be sent to an accepting landfill for disposal
- A construction methodology will be required by the contractor to be tailored to reduce, where possible, dust noise and air pollution; to minimise interference with the environment and the neighbouring areas.
- Any spoil or waste material generated from the construction process is to be temporarily stored at an approved location on site, before being removed to an accepting licensed waste disposal facility.
- All infrastructure is to be appropriately tested by an approved method during the construction phase, all in accordance with Uisce Éireann / SDCC Requirements.
- Connections to the service providers are to be carried out to the approval and / or under the supervision of the Local Authority or relevant utility service provider, prior to commissioning.
- All new sewers are to be inspected by CCTV survey post construction; to identify any possible physical defects for rectification prior to operational phase.
- Prior to the commencement of excavations in public areas, all utilities and public services are to be identified and checked; to ensure that adequate protection measures are implemented to minimise the risk of service disruption.
- All excavations within the public area are to be back-filled in a controlled manner and surface re-instated to the satisfaction of the Local Authority.

With the implementation of these mitigation measures, the severity of the impact of the proposed development on the built services will be minimised, with tie-ins to existing services and installation of new services completed in a satisfactory manner for the relevant service providers.

14.7.3 Operational Phase

The material assets are to be constructed in accordance with all relevant local authority and UÉ standards.

14.7.4 Do Nothing Scenario

If the proposed mitigation measures are not implemented, then the risks of impact of construction of the proposed development are not reduced.

14.8 Monitoring

The construction of works should be monitored to ensure compliance with relevant SDCC and UÉ requirements, and health and safety legislation.

The operational phase of public works should be monitored by those responsible for the respective asset.

The operational phase of private assets should be monitored by the management company for the development. By ensuring that these networks are adequately supervised the potential for water or effluent leaks are reduced to within acceptable limits.

14.9 Reinstatement

After construction, all assets are to be backfilled and reinstated in accordance with the design and relevant local authority/UÉ requirements.

14.10 Cumulative Impacts

Drainage and water supply material assets should be co-ordinated with communications, electrical and gas material assets to ensure that there are no physical conflicts and that all necessary clearances are provided.

An online planning search was undertaken by Tom Phillips & Associates for current and recently permitted development applications within a 2km radius of the proposed site within the past year. These projects are evaluated for cumulative effects in the table below.

SDCC Reg. Ref	Applicant	Project Description	Status	Likely Cumulative Effects
SD23A/0039	Microsoft Operations Ireland Limited	Provision of an establishment to which to European Communities (Major Accident Hazards involving Dangerous Substances) Regulations 2006 as amended by Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 apply, constituting a change of use; The new establishment will include all the existing and permitted buildings (SD13A/0143 as amended by SD13A/0265, SD14A/0194 as amended by SD15A/0343, SD16A/0088 as amended by AD17A/0318 & SD20A/0283, SD21A/0203 & SD21A/0288, all within an existing campus; The proposal relates to the total quantum of fuel oil to be stored within existing and permitted tanks across the existing and permitted buildings; For the avoidance of doubt no works or physical development is proposed and the application relates to an existing development which comprises or is for the purpose of an activity requiring an integrated pollution prevention and control (IE) licence.	Permitted	No cumulative effects foreseen. The project will not result in significant effects when combined with the proposed development.
SD23A/0079	Grange Backup Power Ltd.	Alterations to a previously approved development (Reg. Ref. SD15A/0061 and Reg. Ref. SD16A/0398) which relates to a 10-year permission for the construction of a Peaker Power Plant in a single storey building with a mezzanine level, together with associated plant equipment including water & fuel tanks. The alterations to the previously approved development (Reg. Ref. SD15A/0061 & SD16A/0398) include the following: (i) alterations to the previously approved building within the eastern portion of the site as follows: (a) an increase in the overall footprint of the building to the north-west to include office space, and staff facilities at ground floor level; and to the north-east to include a boiler room at ground floor level; (b) revised roof footprint to the rear of the building, with the roof being lowered to the rear; (c) relocation of stair cores and updates to building elevations, including the introduction of additional glazing; (d) amendments to the external open service yard to the north of the building including the removal of the previously approved transformer rooms, addition of containerised plant and minor alterations to the location of shaft towers; (e) a minor increase in the height (by 600mm) of the screen to the service yard. Alterations to the western portion of the site include; (ii) minor amendments to the positioning of the internal roadway; (iii) amendments to the tank bund area and tank arrangement to the west of the site, and the addition of contained plant and a pump house building; (iv) minor amendment to the location of the approved tanker unloading area; (v) relocation of car parking spaces from the south of the site to the north of the main bund areas, with the exception of the approved accessible parking space; (vi) provision of a gas skid & support structure to the south-west of the site; (vii) provision of an enlarged plant compound to the west of the bund area and relocation of transformers to this compound; (viii) revisions to the positioning and an increase in size of the approved pipe bridge to align with services; (ix) provision of a new bicycle parking shelter comprising 8 no. parking spaces; (x) amendments to soft landscaping to accommodate the revised layout and; (xi) drainage, boundary treatments, site lighting, EV car charging ports; and all associated site development and ancillary works necessary to facilitate the development. The capacity of the plant will be 115MW as approved under Reg. Ref.	Permitted	No cumulative effects foreseen. The project will not result in significant effects when combined with the proposed development.

		SD15A/ 0061. This application relates to development which comprises of an activity which requires an Industrial Emissions Licence in accordance with the First Schedule of the EPA Act 1992 as amended.		
SD23A/0123	Pfizer Ireland Pharma	Permission for development consisting of the completion of the development granted permission under Planning Application Reg. Ref. SD16A/0236 subject to the amendments and alterations to the previously approved biopharmaceutical manufacturing facility and warehouse extension and other additional, new development not forming part of SD16A/0236, located at the Pfizer site at Grange Castle Business Park, New Nangor Road; The modifications to the approved development will consist of alterations and modifications to previously approved site buildings and infrastructure required to support the proposed development they include, (a) A 6-level biopharmaceutical manufacturing building sized approximately 30,469sq.m (previously approximately 34,650sq.m) and approximately 35 metres high (previously approximately 28.2m high), with stairwells approximately 38m high, and roof-mounted plant and equipment, including solar panels; Modifications to the existing Development and Manufacturing Facility including elevational alterations and modifications to existing plant and equipment; (b) A single-storey warehouse building extension with high-bay, sized approximately 3,200 square metres (previously approximately 1,142sq.m) and approximately 17.5m high, with roof-mounted plant and equipment, including solar panels; (c) A single-storey pedestrian and materials link sized approximately 1,687sq.m (previously approximately 750sq.m) and approximately 6.95m high; (d) A new, additional 4-level extension to the existing DS1 biopharmaceutical manufacturing building, to accommodate material lifts and storage areas, sized approximately 1,925sq.m and approximately 38.2m high, to the south elevation of the existing building; (e) A new, additional single-storey chiller building sized approximately 395 square metres and approximately 6.25m high, with roof-mounted plant and equipment; (f) A new, additional single-storey plant and utilities building sized approximately 256sq.m and approximately 6.25m high, with roof-mounted plant and equipment; (g) Provision of relocated car park from its previously permited location at the northeast of the side to a new location to the southeast of the proposed biopharmaceutical facility; including approximately 273 additional car parking spaces, including accessible car parking spaces, electric vehicle charging, motorcycle parking, dedicated car-pooling spaces and cycle parking, all accessed from the internal Grange Castle Business Park roads. Mobility parking is located adjacent and directly north of the proposed facility; (h) A relocated, single-storey security building sized approximately 60 sq.m and 6m high; (i) The proposed site infrastructure includes additional cooling towers/heat exchangers, a tank farm, pipe-bridges, surface water harvest tanks, docks and yard areas, including associated items of plant and equipment, an electric vehicle charging and solar panel substation to service photovoltaic panels over new car parking spaces, photovoltaic solar panels located over new car parking spaces, electrical generators, underground pumping facilities and internal roads and paths, fencing and site lighting, and the use of the existing Pfizer site entrance (Gate No.3) for heavy goods vehicles; (j) The development includes modifications to and the extension of, the existing internal road network within the Pfizer Campus; (k) Proposed new landscaping includes new landscaped and planted areas, replacement and reinforcement of the existing	Permitted	No cumulative effects foreseen. The project will not result in significant effects when combined with the proposed development.

		landscaping and modifications to existing berms and perimeter security fencing and gates; (l) Proposed new signage based at ground level and on the building facades on the proposed new production building; (m) The works include temporary contractor compounds, temporary car parking and the temporary use of existing site entrances during construction activities; (n) Proposed new surface water management infrastructure for the site, consisting of underground attenuation systems, rainwater harvest cisterns and distribution pipework; (o) All associated site works including sustainability features described in points (a) to (l); Planning permission for the construction of a temporary contractors car park on land to the west of the Pfizer facility with access off Grange Castle Business Park and the reinstatement of the lands to agriculture after the need for the car park expires; The application is seeking permission of 5 years for the completion of the development granted permission under PA Ref: SD16A/0236 subject to the above amendments and alterations to the previously approved Biopharmaceutical Manufacturing Facility and Warehouse and other additional, new, development not forming part of SD16A/0236; This application consists of a development for an activity for which a licence under Part IV of the Environmental Protection Agency Act 1992 (as amended by the Protection of the Environment Act, 2003) is required; An Environmental Impact Assessment Report (EIAR) accompanies this planning application.		
SDZ23A/0011	Newview Education Ltd	Change of use of unit 3 (56sqm) from Class 1 (retail) to Class 9 (Residential Training Centre) and associated signage and ancillary works. The development will take place within Adamstown Strategic Development Zone.	Permitted	No cumulative effects foreseen. The project is located within an existing built site and will not result in significant effects when combined with the proposed development.
SD23A/0012	Data & Power Hub Services Limited	Construction of a new Battery Energy System Storage (BESS) and Power Trunk building and all associated elements; Demolition of all existing structures on site associated with the current golf centre - including main clubhouse and a number of ancillary structures (total 1,009.84sq.m); Construction of a two storey power trunk building (maximum height 10.3m) over basement of 1,982.61sq.m containing MV switchgear; Construction of a BESS to reach a total capacity of 186.3 MWe; The facility will be within an open three storey structure (maximum height of 17.3m), totalling 18,560.9sq.m in area, containing 63 battery containers, & 63 no containers containing power invertors, step up transformers and electrical switchgear and roof level array of 1384 PV panels; 1 two storey administrative welfare buildings (298.26sq.m) associated with the BESS facility; It will be provided with a pre-cast wastewater treatment plant (up to 6 P.E.) discharging to	Permitted	No cumulative effects foreseen. The project will not result in significant effects when combined with the proposed development.

		percolation area with polishing filter for foul effluent; 1 single storey Fire Pump and Water Service Plantroom of 174.1sq.m, with associated water tank -associated with the BESS facility; 1 underground rainwater harvesting tank (volume 125 cubic meters - associated with the BESS facility of 35sq.m; 9 car parking spaces (including 3 disabled and 2 electric vehicle charging parking spaces) and 8 cycle spaces; The removal of an existing 15m high telecommunication support structure; Internal road network and new servicing access road from an entrance on Peamount Lane - with amendments to the existing entrance, comprising widening the entrance, provision of new security checkpoint, setting back of the boundary to achieve sufficient visibility splays, and reinstatement of appropriate boundary treatment along the Peamount Lane frontage; Site landscaping, planting, berms and retaining walls along site boundaries and security fencing; and all associated site services, lighting, infrastructural works and attenuation (SUDS features, underground storage and an above ground pond).		
SD23A/0301	MLEU Dublin 4 Limited	Permission for development consisting of: The construction of five logistics / warehousing units (Units 1-5) with associated office accommodation, service yards, ancillary structures/areas, and substations. The overall floor area of the proposed logistics/warehousing units is c. 56,932 s.q.m. (Gross Internal Area (GIA)) with a total of c. 4,336 s.q.m. of office space. See following breakdown of each unit: Unit 1 will comprise GIA c. 10,432 s.q.m. including c.579 s.q.m. of associated office space) and measures c.17.9m from finished floor level (FFL) to roof ridge; Unit 2 will comprise GIA c. 18,065 s.q.m. (including c.1,005 s.q.m. of associated office space) and measure c.18.4m from FFL to roof ridge; Unit 3 will comprise GIA c. 6,325 s.q.m. (including c.579 s.q.m. of associated office space) and measure c.17.4m from FFL to roof ridge; Unit 4 will comprise GIA c.8,762 s.q.m. (including c.484 s.q.m of associated office space) and measures c.17.8m from FFL to roof ridge; Access to the site will be from the existing roundabout to the south of the site; Provision of no. 419 car parking spaces and 172 bicycle spaces to serve the proposed development; Associated works for the diversion of the existing foul sewer within the site; The provision of attenuation basins/wetlands across the site; Associated works for re-routing of the existing ESB overhead wires which traverse the site to underground cables within the site; The formation of plateaus on the site with surplus excavated material to allow for the future Phase 2 development and; All ancillary landscaping, boundary treatments, internal roads and roundabout, cycle/pedestrian paths, associated infrastructure, and site development works to support the development.	Permitted	No cumulative effects foreseen. The project will not result in significant effects when combined with the proposed development.

Table 14.1: Relevant projects within 2km of the proposed development.

The planning search also noted that there is no planning history for the proposed site and there are no developments with planning permission/submitted for planning permission withing the boundary of the subject site.

14.11 Interactions

In preparation of this Chapter interactions with the Hydrology Chapter occurred.

14.12 Difficulties

There were no difficulties encountered in preparing this chapter.

14.13 Appendices

Appendix 14.1: Uisce Éireann Confirmation of Feasibility Letter

15.0 ARCHAEOLOGICAL, ARCHITECTURAL & CULTURAL HERITAGE

15.1 Introduction

The following chapter details an archaeological, architectural, and cultural heritage assessment undertaken in advance of a proposed development at Grangecastle Media Park, in the townlands of Brownstown, Coolscuddan and Milltown, County Dublin (ITM 700666,731691, Figure 15.1). The assessment aims to ascertain any likely and significant impacts that the proposed development may have on the existing cultural heritage resource.

The assessment was undertaken by Faith Bailey and Jonny Small (PhD, MSci) of IAC Archaeology. Faith (MA, BA (Hons), MIAI, MCIfA) has over 20 years of experience in archaeological and cultural heritage consultancy and has been responsible for the production of multiple EIAR and assessments for all aspects of development nationwide.

This study determines, as far as reasonably possible from existing records, the nature of the cultural heritage 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 a programme of study of the historic environment within a specified area or site on land, in the inter-tidal zone or underwater 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; the character of the study area, including appropriate consideration of the settings of heritage assets (CIfA 2020,4). 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 heritage sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Suggested mitigation measures based upon the results of the above research.

15.1.1 Definitions

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

‘Cultural Heritage’ where used generically, can be 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).

‘Architectural heritage’ is applied to structures, buildings, their contents, and settings of an (assumed) age typically younger than AD 1700; and

'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.

15.2 Methodology

Research has been undertaken in three phases. The first phase comprised a paper survey of all available archaeological, architectural, historical, and cartographic sources. The second phase involved a field inspection of the proposed development area. The third phase involves a programme of archaeological test-trenching.

15.2.1 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;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- South Dublin County Development Plan 2022-2028;
- Aerial photographs;
- Place name analysis;
- Excavations Bulletin (1970–2023); 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. All recorded archaeological 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 area.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The South Dublin County Development Plan (2022–2028) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area.

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.

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, Bing Maps and Google Earth.

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 1970–2023.

The National Inventory of Architectural Heritage (NIAH) 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.

15.2.2 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 archaeological, architectural, and cultural heritage field inspection entailed:

- Walking 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.

15.2.3 Archaeological Testing

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). Following a geophysical survey of the overall Grangecastle development lands in 2018, a programme of archaeological testing was carried out within the site in April 2021 by David Bayley of IAC under licence 20E0486 (Bayley 2022). A summary of the archaeological testing is presented in this chapter and the full technical report is included in Appendix 15.1.

15.2.4 Consultation

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the baseline 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;
- South Dublin County Council: Planning Section; and
- Historical and Ordnance Survey Maps.

15.2.5 Guidance and Legislation

The following legislation, standards and guidelines were consulted as part of the assessment:

- National Monuments Act, 1930 to 2014;

- The Planning and Development Acts, 2000 (as amended);
- Heritage Act, 1995 (as amended);
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the Information to be contained in Environmental Impact Assessment Report 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.

15.2.6 Assessment Criteria

The quality and type of an impact 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 Impact: 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 Impact: A change which does not affect the quality of the environment;
- Positive Impact: A change which improves the quality of the environment, for example a change that improves or enhances the setting of archaeological or cultural heritage site.

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

- Direct Impact: Where an archaeological/architectural/ 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 Impact: Where a feature or site of archaeological, architectural, or cultural heritage merit or its setting is located in close proximity to the footprint of a development.

15.2.7 Significance of Effects

Definitions (as defined by the EPA 2022 Guidelines):

- Imperceptible: An effect capable of measurement but without noticeable consequences.
- Not significant: An effect which causes noticeable changes in the character of the environment but without noticeable 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 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 the majority of a sensitive aspect of the environment.
- Profound Effects: An effect which obliterates sensitive characteristics.

15.3 Baseline Environment

15.3.1 Introduction

The proposed development is located within the townlands of Brownstown, Coolscuddan and Milltown, Parish of Kilmactalway, and Barony of Newcastle, County Dublin. The proposed development area comprises a greenfield site, consisting of two fields bounded to the north by the course of the Grand Canal. There are no recorded monuments within the proposed development area. The closest recorded monument outside the proposed development boundary consists of an enclosure (DU017-095), located c. 234m to the south.

There are no protected structures or buildings listed in the NIAH, located within the proposed development area. The closest protected structure comprises Gollierstown Bridge, also listed in the NIAH Survey (RPS 131, NIAH 11208014), located c. 400m to the east (Figure 15.1).

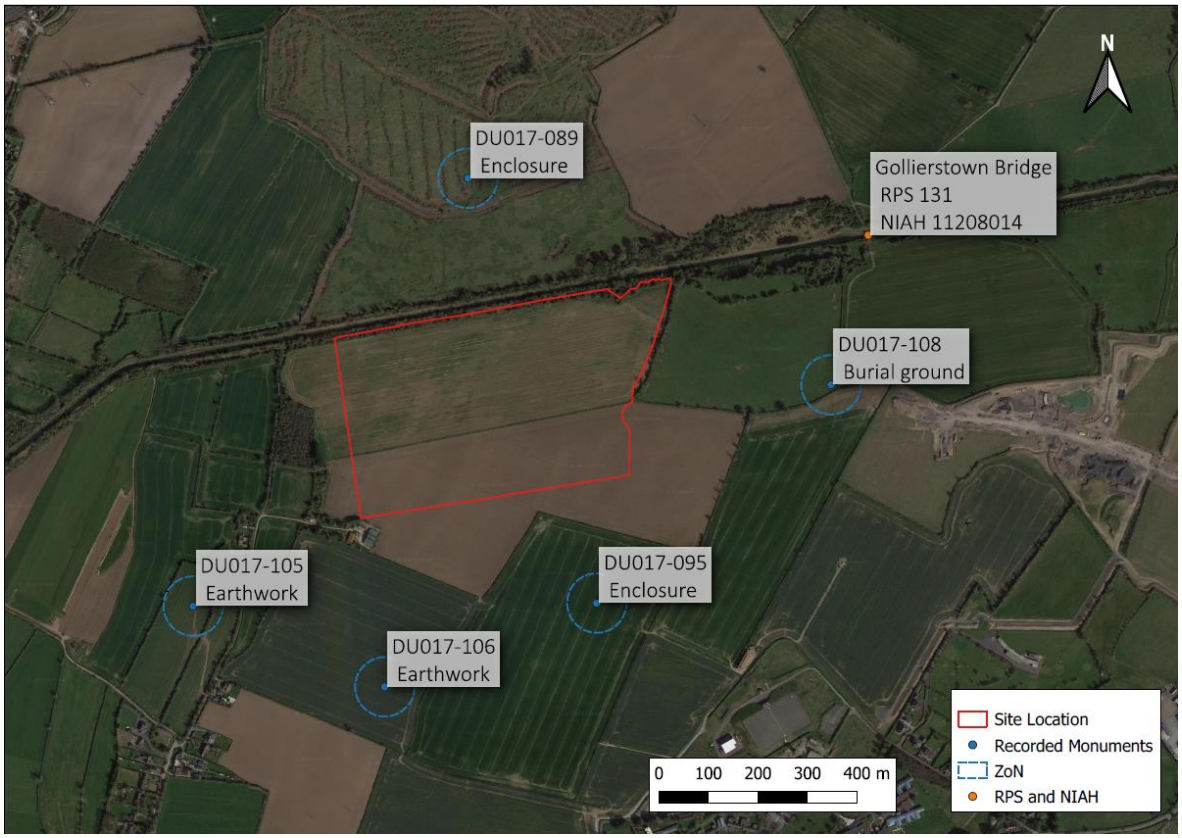


Figure 15.1: Site location showing surrounding recorded monuments and built heritage sites.

Prehistoric Period

Mesolithic Period (c. 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 (Warren 2022). The presence of Mesolithic communities is most commonly evidenced by scatters of worked flint material, a by-product of the production of flint implements.

Although the coastal areas of County Dublin have produced flint tools dating to the Mesolithic and seasonal habitation sites have been interpreted through the discovery of shell middens along this coastline there are no recorded sites dating to the Mesolithic in the study area or wider vicinity of the proposed development.

Neolithic Period (c. 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.

Although there is no evidence of Neolithic activity in the immediate vicinity of the proposed development area, the remains of a truncated and burnt Neolithic wooden house were discovered in the townland of Kishoge, c. 3km to the east (Bennett 2001:438, Licence No. 01E0061), indicating that the wider landscape was occupied during the Neolithic period. A small number of artefacts were retrieved, including several crude round scrapers, waste flint and a single poorly preserved fragment of prehistoric pottery.

Bronze Age (c. 2500–800 BC)

The Bronze Age was marked by the widespread use of metal for the first time in Ireland. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. The construction of megalithic tombs went into decline and the burial of the individual became typical. Cremated or inhumed bodies were often placed in a cist, which is a stone-lined grave, usually built of slabs set upright to form a box-like construction and capped by a large slab or several smaller lintels (Buckley & Sweetman, 1991). Barrows are earthen burial monuments, which consist of a circular area surrounded by a fosse, often with an external bank. The term ring ditch is sometimes applied to barrows with a flat centre. These sites often contain a cist burial.

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.

The archaeological investigations within the proposed development area have revealed the presence of an area of burnt mound activity with multiple burnt mound spreads and associated troughs and pits, located centrally in the northern half of the site (AA1). A pit containing similar burnt material to the spreads was revealed in the northwestern area of the proposed development (AA2).

Archaeological test trenching by IAC at Gollierstown, located c. 925m to the east, revealed the presence of a probable burnt mound (McIlreavy 2023, Licence 23E0431), which is likely to represent the remains of a ploughed out *fulacht fia*.

Iron Age (c. 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). This period remains, however, 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. There are no known monuments in the vicinity of the proposed development area that would suggest an active presence of Iron Age communities in this area.

Early Medieval Period (c. 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).

The ringfort or rath is considered to be the most common indicator of settlement during the early medieval period (Stout 2017). 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. 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.

In 2019, geophysical survey and subsequent archaeological testing uncovered a large enclosure, c. 1.5km to the east of the proposed development area. This was subject to full archaeological excavation in 2019 (Bennett 2019:25; Licence No. 19E0038). The enclosure has been interpreted as being early medieval in date, possessed a number of phases and was accompanied by radial ditches forming paddocks.

It is possible that the roughly circular recorded enclosures and earthworks in the vicinity of the proposed development area (DU017-089, DU017-095, DU017-105, DU017-106) represent the remains of early medieval enclosures or denuded ringforts, although the majority of these have not been investigated to date.

Archaeological monitoring for a pipeline (Kehoe 2003; Licence No. 02E1281) was carried out c. 370m to the east of the proposed development area in 2003 and this resulted in the identification of a number human burials. These remains, although very poorly preserved, were discovered in-situ and as such represent a historic burial ground of likely early medieval date. The site was recently added to the RMP as DU017-108.

Medieval Period (c. AD 1100–1600)

The beginning of the medieval period was characterised by political unrest that originated from the death of Brian Borumha in 1014. Diarmait MacMurchada, deposed King of Leinster, sought the support of mercenaries from England, Wales and Flanders to assist him in his challenge for kingship. Norman involvement in Ireland began in AD 1169 when Richard de Clare and his followers landed in Wexford to support MacMurchada. Two years later de Clare (Strongbow) inherited the Kingdom of Leinster and in AD 1171, Dublin was besieged and taken by Diarmait MacMurchada and his Leinster forces supported by a force of Anglo-Norman knights led by Strongbow (Richard Fitz-Gilbert de Clare) and Raymond le Gros. By the end of the 12th century the Normans had succeeded in conquering much of the country (Stout and Stout 1997). The initial stage of the invasion of the country was marked by the construction of motte and bailey castles, which were later replaced with stone castles.

Castle Adams (DU017-029) is found within the wider area of the proposed development at Adamstown, c. 1.9km to the northeast. The three-storey tower house was formed by a projecting turret and stepped crenelations and was demolished in the 1960s. A further castle is found at Grange (DU017-034), c. 2.8km to the east. In 1997 monitoring and excavation (Bennett 2016:340, Licence No. 16E0520) were undertaken in the vicinity of the castle and identified a number of medieval field boundaries.

A medieval graveyard was identified at Stacumny (KD011-021001), c. 1.1km to the northwest of the proposed development. Excavations were undertaken in 1997 (Bennett 2011:353, Licence No. 97E0119) and uncovered 728 inhumations dating between c. 1120 and c. 1275, although the location of the associated church (KD011-021) was not found.

After the Anglo-Norman conquest the ecclesiastical site at Aderrig, c. 1.5km to the north of the proposed development area, was granted to St. Patrick's Cathedral in the 13th century (DU017-028001-002). The earliest documentary reference to the church occurs in 1235 and was still in use at the beginning of the 17th century (SMR file). The church is bounded by an

enclosure (DU017-028001). An associated graveyard (DU017-028003) and field system is also present (DU017-028003-004).

Post-Medieval Period (AD 1600–1900)

The 17th century saw a dramatic rise in the establishment of large residential houses around the country. The large country house was only a small part of the overall estate of a large landowner and provided a base to manage land that could be located nationwide. During the late 18th and early 19th centuries, lands immediately associated with the large houses were generally turned over into a parkland estate (demesne). Although the creation of a parkland landscape involved working with nature, rather than against it, the considerable constructional effort went into its creation. Earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate. Whilst the designed landscapes possessed an ornamental form, they still retained a valuable function; providing grazing for livestock and habitats for game. Some of the larger houses and demesnes in the surrounding area include Peamount House c. 730m to the south-southeast and Milltown House c. 1.58km to the southeast. There are no demesne landscapes located within the study area of the proposed development.

The Grand Canal, located to the immediate north of the proposed development area, is c. 131km long and links Dublin City to the River Shannon. Work began on the canal in 1756 and it was officially opened to traffic in 1804. While the rise of the railway significantly reduced the popularity of the canal, it was not until 1960 that the last cargo was transported along the Grand Canal. The proposed development area is located to the immediate southwest of disused quarries, which provided building material for the canal itself. Although the quarries are not shown on Rocque's 1760 map (Figure 15.4), they are depicted in detail on the first edition OS map (1843, Figure 15.5). Gollierstown Bridge (c. 1780) (RPS 131, NIAH 11208014) was constructed to facilitate the movement of material from the quarry and originally joined a trackway to the east of the proposed development area. Today the bridge is only in use as farm access.

15.3.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970–2023) has revealed that a number of investigations have been carried out within the surrounding environs (Figure 15.2), which are summarised below. Archaeological testing carried out in order to inform this assessment is summarised in section 15.3.12.

Geophysical survey within the proposed Grange Castle Business Park West development was carried out by Target Geophysics in 2018 (Nicholls and Murphy 2018; Licence No. 18R0222). The site was included within the northwest portion of the surveyed area, within areas M1 and M2. The geophysical survey recorded potential archaeological remains within the proposed development area (Figure 15.7). These are summarised in more detail in section 15.3.12 below.

The survey of M4 was successful in defining the location and extent of potential archaeological remains associated with enclosure site DU017-095, which lies to the south of the proposed development area. Further possible archaeological features identified outside of the proposed development area included an enclosure and trackway to the southwest (M3), a possible ring ditch to the south (M5) and possible enclosure remains to the east (M9, M11 and

M12), as well as remnants of early field systems (M4-M6 and M11). The results from M1-M12 highlight changing patterns of land use, including former cultivation regimes, disused field boundaries, buried services, and magnetic disturbance from modern sources of interference.

The geophysical survey was followed by archaeological testing within the proposed development area (Bayley 2022, Licence No. 20E0486) which identified five separate areas of archaeological potential (AA1-AA5), including burnt mound activity, possible kilns and a ditch containing medieval ceramic. These are summarised in more detail in section 15.3.13 below and the full report is included in Appendix 15.1.

In 2019 archaeological testing was carried out prior to the development of a distribution road development associated with the Grangecastle West Business Park (Bennett 2019:836; Licence No. 19E0370). A number of archaeological sites were identified to the east of the proposed development area. These comprised Milltown 1; Milltown 2, Milltown 3 and Brownstown 1. Excavations at Milltown 1 identified an enclosure consisting of two concentric enclosing ditches, a possible kiln and a pit filled with charcoal and heat shattered stone, likely associated with burnt mound activity (Bennett 2019:755; Licence No. 19E0680). Milltown 2 comprised a cluster of ditches and linear features (Bennett 2019:756; Licence No. 19E0681) and Milltown 3 comprised two linear ditches (Bennett 2019:757; Licence No. 19E0682). Excavations were carried out at Brownstown (Bennett 2020:656; Licence No. 19E0370 ext.), located in the northeast portion of the proposed development area. This was conducted after a programme of archaeological testing in 2019 (Bennett 2019:836; Licence No. 19E0370). The excavation of the identified in-situ burning revealed three separate brick kilns that were heavily ploughed out with no upstanding remains present. The main indicators for the presence of the kilns were broken brick within the furrows throughout the site and the pattern of in-situ burning. The brick kilns may be related to the wider quarrying activity shown on the first edition map (1843) at Gollierstown.

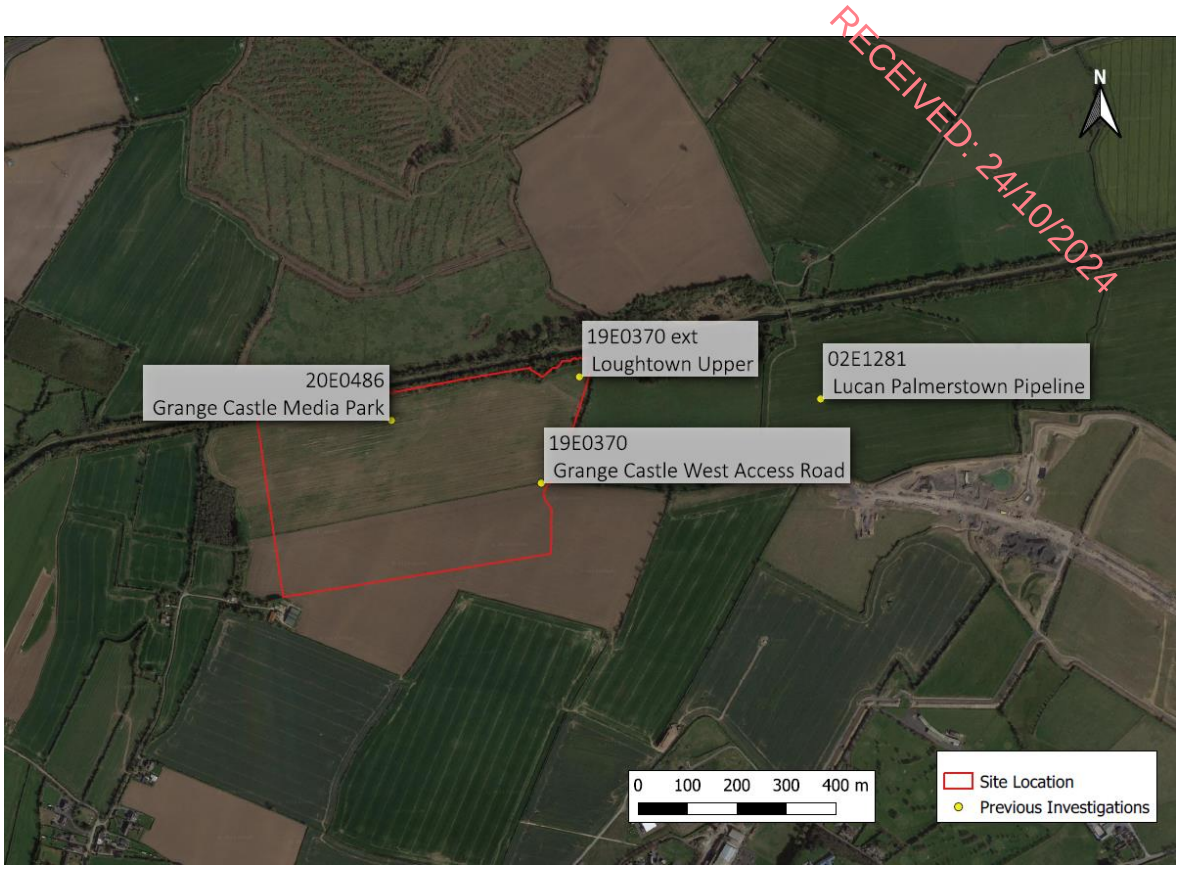


Figure 15.2: Locations of previous archaeological investigations.

Archaeological monitoring for a pipeline was carried out to the east of the proposed development area in 2003 and this resulted in the identification of a number (approx. 13) of human burials (Kehoe 2003; Licence No. 02E1281). These remains, although very poorly preserved, were discovered in-situ and as such represent a historic burial ground of likely early medieval date. The full extent of the burials was not recorded, but the remains were preserved in-situ and the pipeline re-directed to run to the immediate east of the hedge line. The site was recently added to the RMP as DU017-108, c. 370m to the east of the proposed development.

Additional archaeological test trenching was carried out during October 2023, as part of the Grangecastle Access Road (Phase 2), located to the immediate southeast of the proposed development area (Coffey 2023; Licence No. 23E0736). The test trenches targeted anomalies discovered during the previous geophysical survey (Target Ltd.; Licence No. 18R0222). Testing revealed four localised areas of archaeological significance, which were designated as Archaeological Areas 1-4 (AA1-4). These comprised two kilns and two hearths. No diagnostic material was recovered from the features during testing works, which may span in date from prehistoric to the early modern period.

In June 2023, a programme of archaeological testing was carried out at Gollierstown, Co. Dublin, c. 370m east of the proposed development area and south of the canal (McIlreavy 2023; Licence No. 23E0431). This followed a geophysical survey conducted across the site by Ger Dowling in April 2023 (Dowling 2023, Licence No. 23R0140). Works revealed three areas of archaeological potential, which have been designated as Archaeological Areas (AA) 1, 2 and 3. AA1 comprised an area of possible medieval activity formed by a number of ditches and one undated pit. AA2 comprised a circular enclosure, which may be early medieval or Bronze Age in date and is listed as DU017-111. The enclosing ditch is relatively shallow, which may

indicate it has been truncated by ploughing. AA3 comprised the remains of a burnt mound, which is likely to be Bronze Age in date.

15.3.3 Cartographic Analysis

Down Survey Maps of the Barony of Newcastle, c. 1655

The Down Survey maps were created as a means to identify land ownership and while they are often scant in detail, major topographical features and occasionally notable man-made landmarks are depicted. The proposed development area is placed within the open lands of 'Loughstown and Brownestowne Unfortified Lands' and 'The Lord Rannelane Gallretts Towne' to the north of 'Mill Towne'.

Rocque's An Actual Survey of County Dublin, 1760 (Figure 15.3)

Rocque's map of 1760 depicts a largely agricultural landscape with a dispersed settlement. The Grand Canal is visible as 'New Canal' to the north, but the development area is shown as open fields to the northeast of 'Laughtown'. Two structures marked 'Brownstown' lie to the immediate southwest of the proposed development. A 'Burying Place' is marked further to the southwest, which is still in use as Brownstown Cemetery, within which is the surviving western quadrant of an ecclesiastical enclosure (DU021-001001). A lime kiln is marked to the southeast near Milltown.

John Taylor's Map of the County of Dublin, 1816

Little has changed in the landscape by the time of Taylor's map of 1816. The development area remains within open land and is partially occupied by a 'Commons' marked to the north of Brownstown, including a trackway leading north to the Grand Canal, which is now named as such. Quarries are shown to the immediate east and northeast of the proposed development, either side of the canal. Associated structures are also depicted, one of which is marked as a kiln, a second is marked as a limekiln. Gollierstown Bridge (RPS 131, NIAH 11208014) is also now visible to the northeast, annotated as 'Gollardstown Bridge'. Peamount House and demesne landscape are depicted to the southeast.

First edition Ordnance Survey Map, 1843, scale 1:10,560 (Figure 15.4)

The development area is located within all or part of 12 fields and the townland boundaries between Coolscuddan, Brownstown, Gollierstown and Milltown are shown running through the site, with the Brownstown/Gollierstown boundary forming part of the eastern boundary. The canal and the quarries to the immediate northeast are shown in detail along with associated structures.

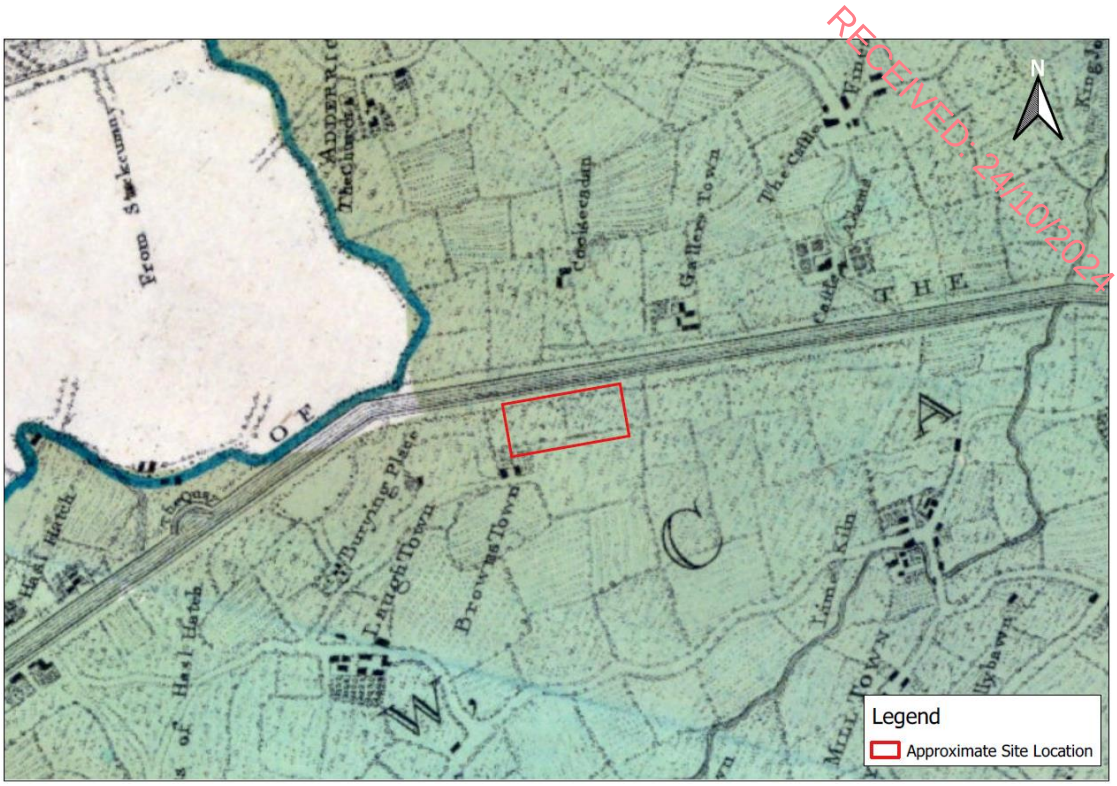


Figure 15.3: Extract from Rocque's map of 1760, (showing the approximate location of the proposed development area).

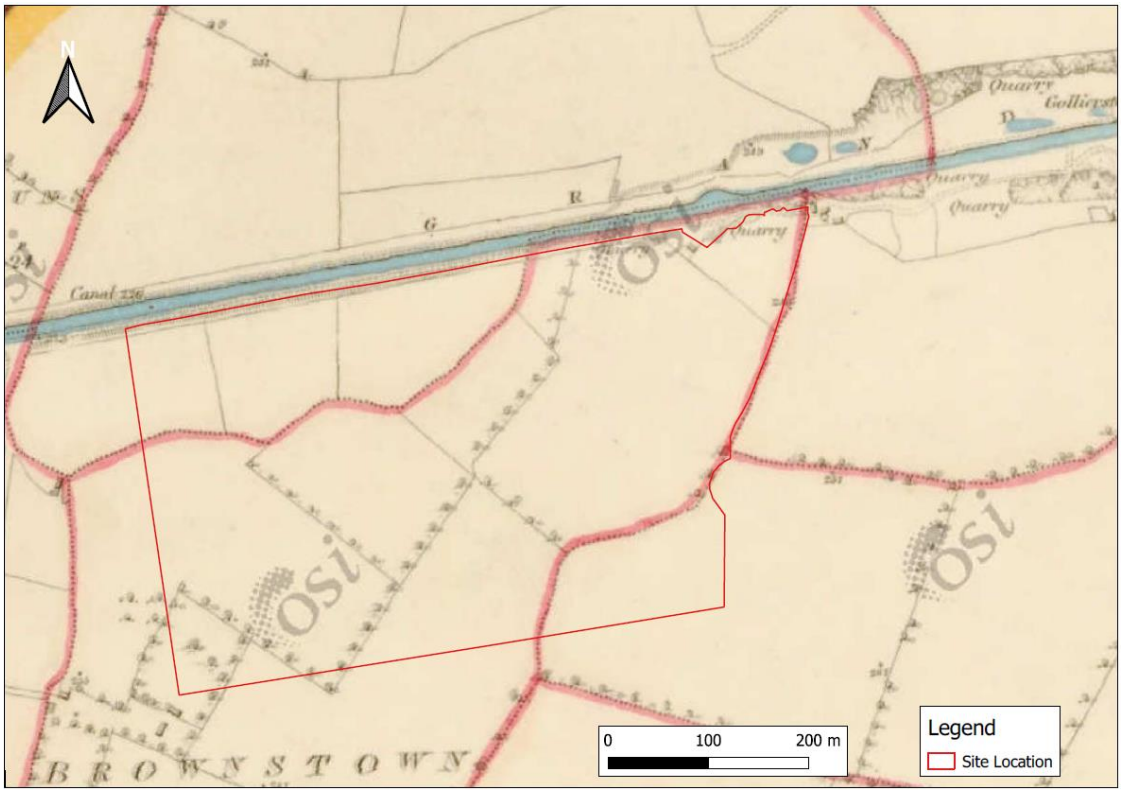


Figure 15.4: Extract from the first edition OS map of 1843, showing the proposed development area**.**

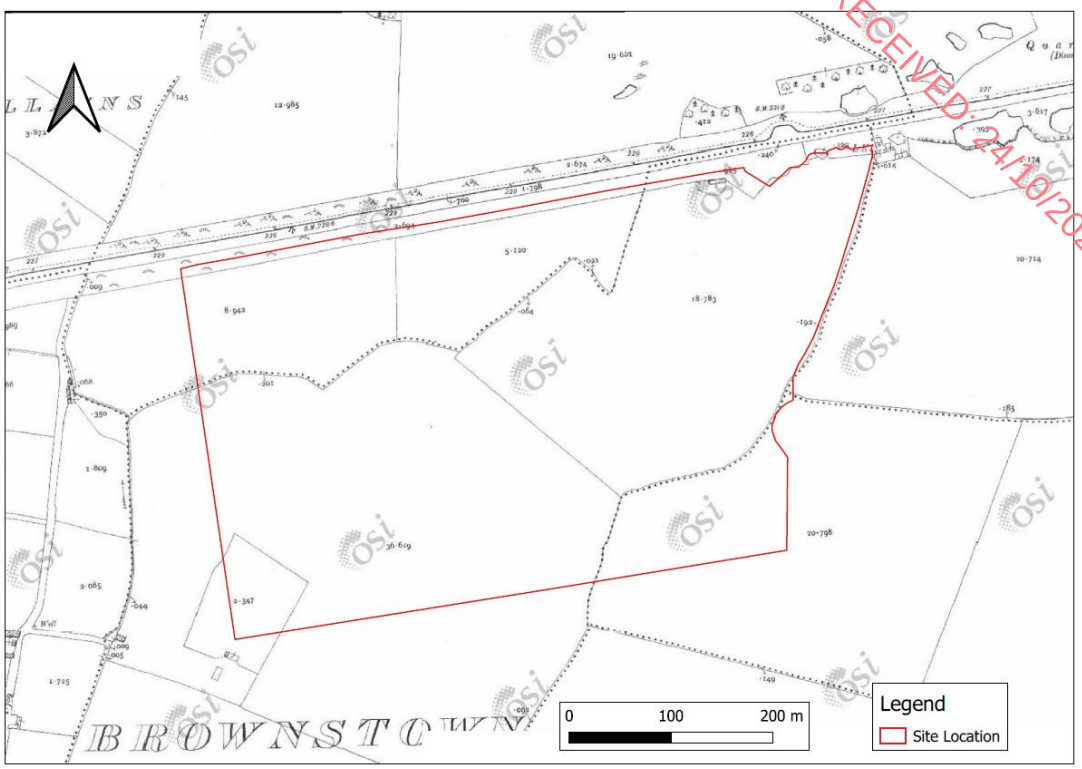


Figure 15.5: Extract from the OS map of 1912, showing the proposed development area.

Second edition Ordnance Survey Map, 1871, scale 1:10,560

There are no major changes to note within the cartography of this map that relate to the proposed development area, although the quarries are no longer annotated as such.

Ordnance Survey Map, 1912, scale 1:2,500 (Figure 15.5)

The lands occupied by the proposed development area have been significantly opened up by the time of this map, with the site now located within parts of six fields. The quarries to the northeast are depicted in slightly less detail than previously and are marked as disused, although a lime kiln (L.K.) remains present.

Ordnance Survey Map, 1938, scale 1:10,560

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

15.3.4 County Development Plan

Record of Monuments and Places

The South County Dublin Development Plan (2022–2028) recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2014). The development plans list a number of aims and objectives in relation to archaeological heritage (Appendix 15.2). It is a policy of the South County Dublin Development Plan (2022–2028) to

promote the in-situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where preservation in situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of development.

There are no recorded monuments located within the proposed development area. There are five sites recorded within the 500m study area around the proposed development, the closest of which is an enclosure (DU017-095), located c. 234m to the south (Table 15.1, Figure 15.1).

RMP No.	Location	Class	Distance from proposed development
DU017-095	Loughtown Upper	Enclosure	c. 234m south
DU017-089	Coolscuddan	Enclosure	c. 267m north
DU017-106	Brownstown	Earthwork	c. 336m south
DU017-105	Loughtown Lower	Earthwork	c. 364m southwest
DU017-108	Gollierstown	Burial ground	c. 375m east

Table 155.1 – Recorded Monuments within the study area.

Record of Protected Structures

The South Dublin County Development Plan (2022–2028) recognises the value of the built heritage to the city and is committed to the protection and enhancement of this heritage by providing measures for the protection of architectural heritage (Appendix 15.3). These include the establishment of a Record of Protected Structures (RPS) and the designation of Architectural Conservation Areas (ACAs).

There are no structures included on the RPS within the proposed development area. There is one structure listed on the RPS within the 500m study area, Gollierstown Bridge (RPS 131), which is also listed on the NIAH Survey. The bridge is located c. 400m east of the proposed development area.

Architectural Conservation Areas

There are no Architectural Conservation Areas (ACAs) within the study area.

15.3.5 National Inventory of Architectural Heritage (NIAH)

Building Survey

A review of the architectural survey was undertaken as part of this assessment and included buildings within the 500m study area. There is one structure listed on the NIAH building

survey, Gollierstown Bridge (NIAH 11208014), which is also a protected structure (Figure 15.1). The bridge is located c. 400m east of the proposed development area.

Structures listed in the NIAH Building Survey do not receive statutory protection; however, those which are also listed in the RPS, receive protection under that designation. The Gollierstown Bridge is both a protected structure and listed in the NIAH.

Garden Survey

There are no demesne landscapes present within the study area. The closest demesne landscape is associated with Peamount House, located c. 675m to the southeast, which is included on the NIAH Garden Survey (Site ID. 2209). The demesne boundary remains visible, although the site has since been developed and expanded with institutional buildings.

15.3.6 Aerial Photographic and LIDAR Analysis (Figure 15.6)

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2023) and Bing Maps revealed that the proposed development area has remained as greenfield since at least the mid-1990s. Historic field boundaries are visible in various images, including the 1995 OS photography and July 2013 Google Earth images. The outline of the quarries depicted on historic OS mapping to the northeast are also discernible.

LIDAR survey, which is available on the GSI Open Topographical Data Viewer, does not show any previously unrecorded archaeological sites within the proposed development area. Potential earthworks are indicated to the east of the site, surrounding the location of the potential early medieval burial ground (DU017-108). The earthworks are not indicated within the historical mapping, so it is possible that they have an archaeological origin.

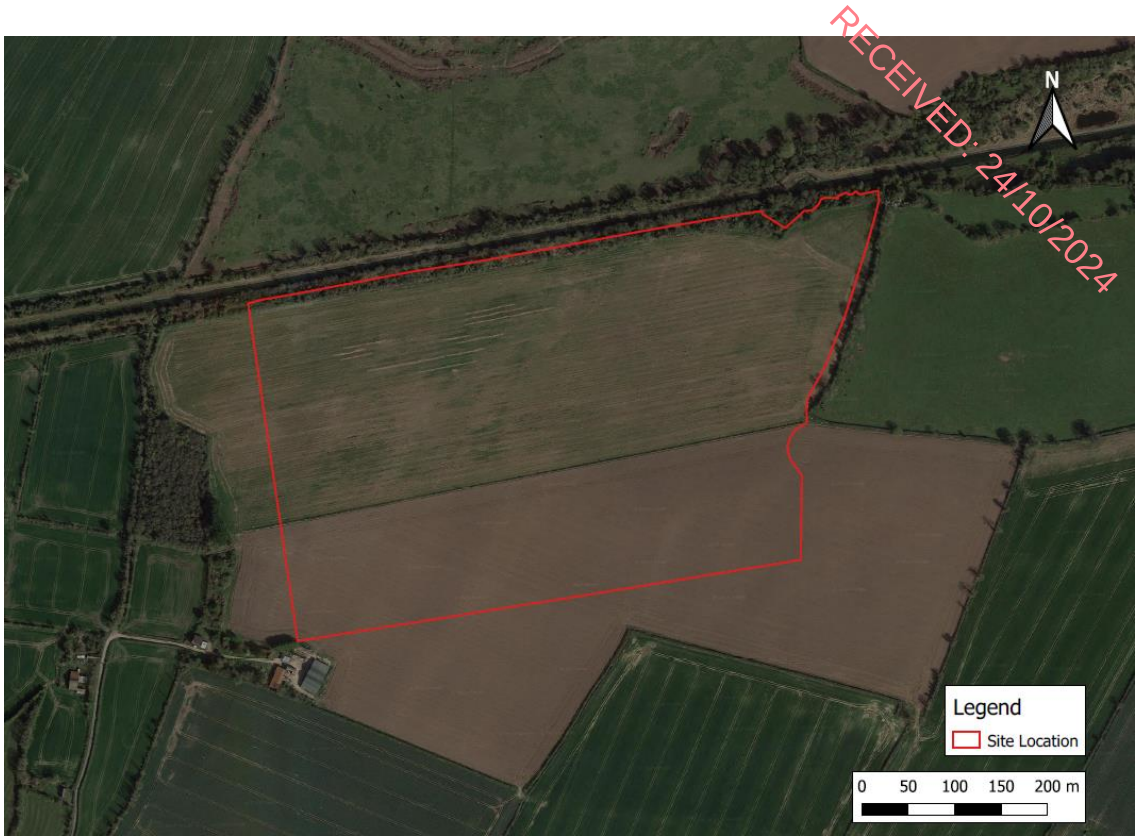


Figure 15.6: Aerial photograph from Google Earth (2021), showing the proposed development area.

15.3.7 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 or the surrounding study area.

15.3.8 Cultural Heritage Sites

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architectural features; however, it can also refer to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. Settlements or industrial features such as mills, millraces, kilns, and bridges which are visible on historic mapping but have disappeared from the modern landscape can also be considered as sites with cultural heritage value. No such sites have been identified within the proposed development area; although the historic quarries, immediately adjacent to the proposed development, would possess some cultural heritage interest.

15.3.9 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 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 1830's and 1840's, 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 is 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 are provided in Table 15.2.

Name	Derivation	Possible Meaning
Balscott	*Baile an Scotaigh*	Scott's Town
Brownstown	*Baile an Bhrúnaigh*	Brown's Town
Coolscuddan	*Cúil Scadáin*	Scadan's corner
Gollierstown	*Baile Gallrath*	Gallonston / Galretts Town
Loughtown Lower	*Baile an Locha Íochtarach*	Town of the lake, lower
Loughtown Upper	*Baile an Locha Uachtarach*	Town of the lake, upper
Milltown	*Baile an Mhuilinn*	Mill town
Mullauns	*Na Mulláin*	Flat hills
Stacumny Cottage	*Cotáiste Steach Cuimne*	Cuimne's house, cottage

Table 15.2: Placenames within the study area.

15.3.10 Townlands

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 meant '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 begin. 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 definition (*ibid*.). Larger tracts 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.

Although not usually recorded as archaeological monuments in their own right, townland boundaries are important as cultural heritage features as they have indicated the extents of the smallest land division unit in the country—the townland. It remains unclear how old these land units actually are, though it has been convincingly argued that they date to at least the medieval period and may be significantly older than this in some cases (McErlean 1983; MacCotter 2008).

The townland boundaries between Coolscuddan and Brownstown, and Brownstown and Milltown are located within the proposed development. The boundary between Brownstown and Gollierstown forms part of the eastern border of the proposed development. The townland boundaries have been removed, with the exception of a section of the boundary along the eastern portion of the proposed development area.

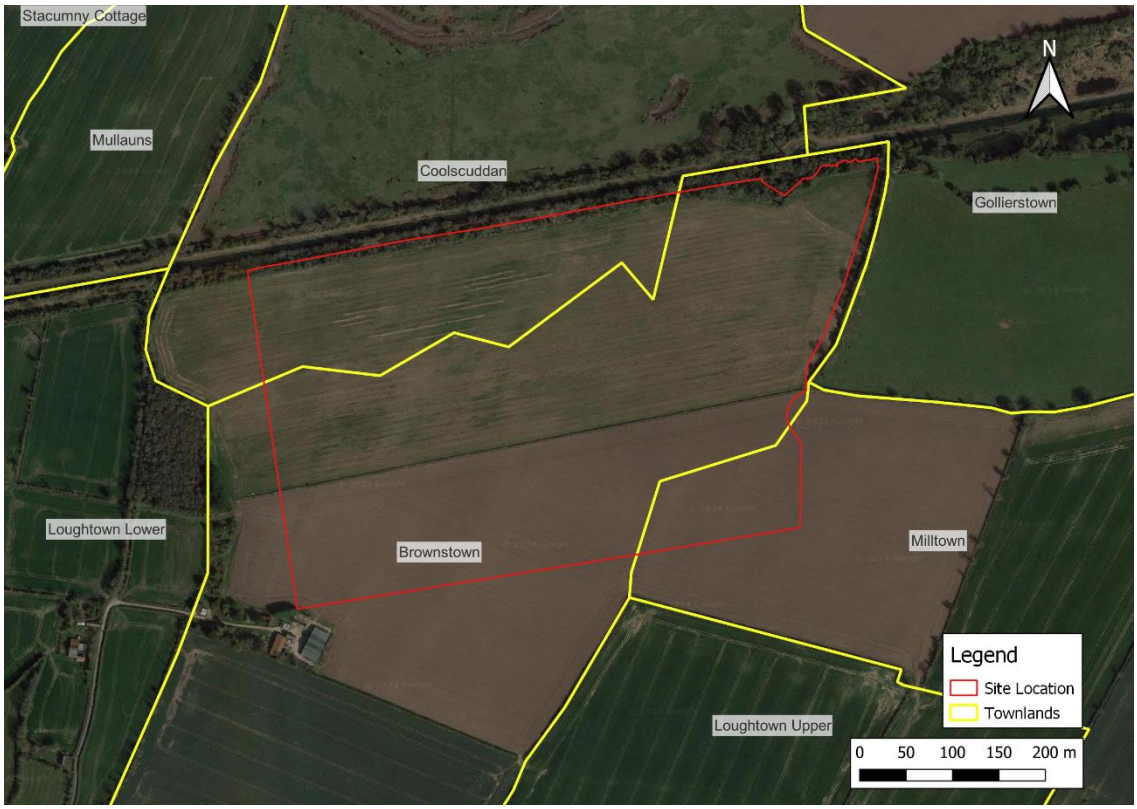


Figure 15.7: Aerial photograph from Google Earth (2021), showing the site location and townland boundaries.

15.3.11 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 area and its immediate surrounding environs were inspected.

The proposed development area forms part of a larger arable field, currently under arable production. The field is level and bounded to the north by mature trees and vegetation that flanks the grand canal. The eastern boundary is formed by the remains of a townland boundary that separates Brownstown from Gollierstown. This is formed by a mature hedgerow and ditch with interspersed trees. Modern farm buildings are located to the southwest along with a small area planted with trees. No previously unrecorded features, areas, or structures of archaeological or architectural heritage merit were noted during the course of the inspection. The townland boundaries that once crossed the development area are no longer present.

15.3.12 Geophysical Survey

Geophysical survey within the overall Grange Castle Business Park West development was carried out by Target Geophysics in 2018 (Nicholls and Murphy 2018; Licence No. 18R0222), on behalf of South Dublin County Council. The proposed development was included within the northwest portion of the surveyed area, within areas M1 and M2. The geophysical survey recorded potential archaeological remains within the proposed development area (Figure 15.7). These included a concentration of strongly magnetic responses, small-scale positives, and increased response within the centre of M1 that were interpreted as potentially representing the remains of a possible *fulacht fia*, group of pit/linear remains or later vernacular building. The potential remains of a small enclosure and pits/postholes were also identified in the northeast of M1. A possible building was also identified within M2, in the southwest of the proposed development.

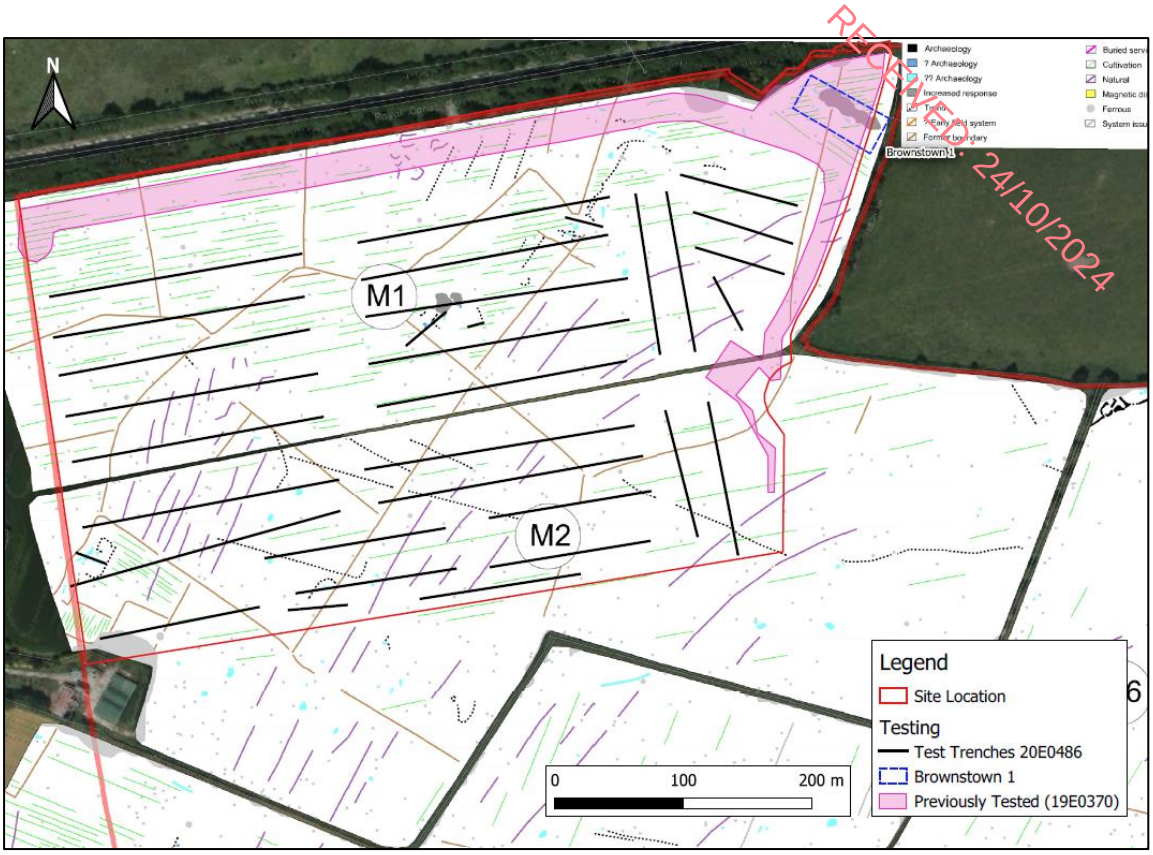


Figure 15.8: Detail of previous geophysical survey and position of 2021 test trenches within the proposed development area.

15.3.13 Archaeological Test Trenching

A programme of archaeological testing was carried out within the development area in April 2021 (Bayley 2022, Licence No. 20E0486, Figure 15.7/8, Appendix 15.1). The trenches targeted geophysical anomalies and open greenfield space within the proposed development area. A total of five Archaeological Areas (AA1-5) were identified during the course of testing. At the time of the testing assessment, the northern boundary of the proposed development area was not included in the overall development area (as illustrated in Appendix 15.1). The northwest corner was not subject to testing, as this area was archaeological excavated as part of the distribution road development.

AA1, located centrally in the northern half of the site, revealed the largest concentration of archaeological features, consisting of multiple burnt mound spreads with associated troughs and pits (Trenches 10, 11 and 13). The second area (AA2) was located in the northwest of the site and consisted of a pit filled with material similar to that found in a burnt spread. The third and fourth areas of potential (AA3 and AA4) were located towards the southeast of the site and both areas consisted of isolated hearths or kilns. AA4 was located within the southern part of the proposed development area The fifth area (AA5) was located in the southwest of the test area and consisted of a ditch from which medieval pottery sherds were recovered.

Detailed plans of each archaeological area are shown in Appendix 15.1.

Figure 15.9: Results of test trenching within the proposed development area showing AA1-5.

15.3.14 Conclusions

The proposed development area is located in the townlands of Brownstown, Coolscuddan and Milltown, County Dublin. There are no recorded monuments within the study area. There are five recorded monuments within the 500m study area, the closest of which consists of an enclosure (DU017-095), located c. 234m to the south.

There are no protected structures or buildings listed in the NIAH, located within the proposed development area. There is one protected structure, which is also listed on the NIAH Survey, within the 500m study area; Gollierstown Bridge (RPS 131, NIAH 11208014), located c. 400m to the east.

A review of Excavations Bulletin (1970–2023) and the available excavation reports has revealed that geophysical survey within the proposed development was carried out by Target Geophysics in 2018 (Nicholls and Murphy 2018; Licence No. 18R0222). The geophysical survey recorded potential archaeological remains within the proposed development area, which may indicate the remains of a possible *fulacht fia*, group of pit/linear remains or later vernacular building. The potential remains of a small enclosure and pits/postholes were also identified in the northeast of M1. A possible building was also identified within M2, in the southwest of the proposed development. The geophysical survey was followed by archaeological test trenching within (Licence No. 20E0486), and to the immediate east of (Licence No. 19E0370), the proposed development. These works led to the excavation of Brownstown 1 (Licence No. 19E0370 ext.), which recorded the remains of three brick kilns, probably of post-medieval date. Testing within the development area (Licence No. 20E0486) identified five separate

areas of archaeological potential (AA1-AA5). This included an area of activity related to multiple burnt mound spreads with associated troughs and pits (AA1), a pit filled with burnt mound material (AA2), isolated hearths or kilns (AA3 and AA4), and a ditch from which medieval pottery was recovered (AA5). Archaeological monitoring for a pipeline was carried out c. 375m to the east of the proposed development area in 2003 and this resulted in the identification of a number (approx. 13) of human burials (Kehoe 2003; Licence No. 02E1231). The site was recently added to the RMP as DU017-108.

No stray finds are recorded in the topographical files of the National Museum of Ireland from within the proposed development or its immediate environs.

Analysis of the available historic cartographic sources depicts the proposed development area as largely undisturbed agricultural greenfield throughout the post-medieval period. Analysis of aerial photography has indicated that this has remained the case throughout the 20th and early 21st centuries. Significant quarrying, initially associated with the construction of the Grand Canal, has taken place to the northeast of the proposed development, and structures associated with the quarries are depicted on historic OS maps immediately adjacent to the proposed development.

A field inspection has been carried out as part of this assessment and this confirmed the results of the desktop analysis. No additional area or sites of archaeological, architectural, or cultural heritage significance were identified. The archaeological areas identified within the proposed development area during 2021 possess no upstanding remains.

15.4 Characteristics of the Proposed Development

The proposed development will include the construction of:

- 6 no. studio/sound stage buildings (ranging between 2,950 sq. m and 3,832 sq. m gfa and totalling c. 22,200 sq. m gfa) comprising internal double height stages with overhead catwalks, 2-storey ancillary production offices including office space, plant and switch rooms, toilets, ICT rooms and staff toilets (c. 35,131 sq. m);
- 4 no. single storey workshop buildings (c. 18,240 sq. m) comprising internal workshop areas, staff toilets and showers, ICT, plant, and switch rooms;
- 3-storey TV studio and welcome centre building (c.10,984 sq. m) comprising 3 no. TV studios and various supporting spaces at Ground Floor level including backstage shooting area, green rooms, hair and makeup rooms, production suites with ancillary offices, wardrobe, laundry room, vision dept, lighting dept, pro service, run and crew kit room, chief engineer office, studio manager office, scenic store, prop store, camera and grip room, lighting and electrical room, plant room, mechanical room, sound control rooms, vision rooms, recording rooms, guest holding areas, security offices, staff toilets and locker rooms; First Floor level to include standard dressing rooms, TV post production rooms, kitchen and crew area, toilets, mechanical/electrical room, technical offices, media store; Second Floor level to include star dressing rooms, toilets, TV post production rooms and outdoor balcony;
- 2 no. outdoor stage areas associated with the TV Studio and Welcome Centre;
- Dining Hall with ancillary theatre (c. 4,363 sq. m) comprising indoor and outdoor dining areas, kitchen, storage and mechanical rooms, toilets, 3 no. meeting rooms and a theatre;
- Standalone café (c. 94 sq. m)

- 3 no. single storey production suite buildings (c.769 sq. m) comprising offices, conference room, kitchenette, communal areas, and toilets;
- 3-storey car parking deck to include 472 no car parking spaces with ancillary offices (c. 3,965 sq.m) refuse recycling area and rooftop plant; and
- Site landscaping to include:
    - an amenity walkway and biodiversity area along the northern boundary of the site;
    - public realm and planting areas in the vicinity of the welcome centre and production suite offices;
    - green roofs; and
    - boundary treatments.
- Hard standing to include backlot area and shooting lanes to facilitate outdoor filming;
- Provision of an Electrical Substation;
- Provision of primary and secondary gate houses;
- Provision of surface car parking & HGV parking area;
- Provision of a waste collection area adjacent to the proposed backlot;
- Provision of rooftop PV panels (Workshops A and B)
- All associated site development works, drainage and services provision, boundary treatments (including security fencing), and associated works.

15.5 Potential Impacts of the Proposed Project

15.5.1 Construction Phase

Archaeological Heritage

No recorded archaeological monuments will be impacted by the construction of the proposed development.

AA1-5 were identified within the proposed development area during archaeological test trenching (Licence No. 20E0486) in 2021. All five areas will be directly, permanently, and negatively impacted upon by the construction of the proposed development, being located within the footprint of the proposed buildings and roadway. Impacts, prior to the application of mitigation, are significant.

It is possible that small or isolated archaeological remains have the potential to survive beneath the current ground level, outside of the footprint of the excavated test trenches. Ground disturbances associated with the construction of the development have the potential to directly and negatively impact on any such remains. Impacts have the potential to range from moderate to very significant, dependant on the nature, extent, and significance of any remain that may be present.

Cultural Heritage

The site of two townland boundaries crosses the proposed development area.. Ground disturbances associated with the proposed development will directly and negative impact on the buried remains of these boundaries. The impact is moderate negative.

Architectural Heritage

No impacts upon the architectural heritage resource are predicted as a result of the construction of the proposed development.

15.5.2 Operational Phase

Archaeological Heritage

No impacts upon the archaeological resource are predicted as a result of the operation of the proposed development.

Cultural Heritage

The development is set back from the edge of the mature boundary that flanks the Grand Canal (between 58m and 80m), located to the north of the site. A green space will be established as part of the development in this area, including planting. The introduction of a media park will result in indirect negative impacts on the canal, as a heritage feature in what is currently a rural setting. The existing vegetation between the canal and the development will be retained but the impact on the setting of the heritage feature over the short-term will be indirect negative slight reducing to imperceptible over the long-term (following the establishment of landscape planting.

Architectural Heritage

No impacts upon the architectural heritage resource are predicted as a result of the operation of the proposed development. The setting of Gollierstown Bridge (c. 400m to the east) will remain unaffected by the development.

15.6 Mitigation Measures

15.6.1 Construction Phase

Archaeological Heritage

It is acknowledged that that preservation in-situ is the preferred method for the conservation of archaeological remains. With regards to AA1-5, it is not possible to preserve the remains in-situ due to the ground disturbance required for the development, including the construction of buildings and infrastructure. Therefore, AA1-5 will be preserved by record prior to the commencement of construction. This will be carried out under licence to the National Monuments Service of the DoHLGH.

All topsoil stripping within the proposed development area will be subject to archaeological monitoring during construction. This will be carried out by a suitably qualified archaeologist. If any features of archaeological significance are identified, consultation with the National

Monuments Service of the DoHLGH will be required in order to determine whether preservation by record or in-situ is the most appropriate manner in which to proceed.

Cultural Heritage

During the course of monitoring topsoil stripping, the site of the townland boundaries crossing the development area will be recorded as part of the overall monitoring exercise. Sections of these boundaries will survive beyond the extent of the development area, preserving evidence of their form and construction.

Architectural Heritage

No mitigation is required.

15.6.2 Operational Phase

No mitigation is required for the archaeological, architectural, or cultural heritage resource at operational phase.

15.7 Residual Impacts

15.7.1 Archaeological Heritage

Following the completion of mitigation measures, there will be no significant residual impacts upon the archaeological resource.

15.7.2 Cultural Heritage

Following the completion of mitigation measures, there will be no significant residual impacts upon the cultural heritage resource.

15.7.3 Architectural Heritage

Following the completion of mitigation measures, there will be no significant residual impacts upon the architectural resource.

15.8 Monitoring

The mitigation measures detailed above would also function as a monitoring system during construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the mitigation measures.

15.9 Reinstatement

Not applicable.

15.10 Interactions

No interactions have been identified during the course of this assessment.

15.11 Cumulative Impacts

All permitted and proposed developments within the study area have been reviewed. As any archaeological remains within the proposed development area will be preserved by record no cumulative impacts have been identified. Similarly, no cumulative impacts have been identified upon the cultural heritage or architectural heritage resource.

15.12 'Do-Nothing' Effect

If the proposed development was not to proceed, there would be no impacts upon the archaeological, architectural, or cultural heritage resource.

15.13 Difficulties Encountered in Compiling the Chapter

No difficulties were encountered during the compilation of this chapter.

15.14 References

Bayley, D. 2022. Archaeological Assessment at Grange Castle Media Park, County Dublin (Licence No. 20E0486). Unpublished report prepared by IAC Archaeology.

Bennett, I. (ed.) 1987–2010. Excavations: Summary Accounts of Archaeological Excavations in Ireland. Bray. Wordwell.

Buckley, V. and Sweetman, P.D. 1991. Archaeological Survey of County Louth. Dublin.

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.

Chartered Institute for Archaeologists 2020a. Standards & Guidance for Field Evaluation.

Chartered Institute for Archaeologists 2020b. Standards & Guidance for Archaeological Excavation.

Chartered Institute for Archaeologists 2020c. Standards & Guidance for an Archaeological Watching Brief (Monitoring).

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. Government Publications Office, Dublin.

Department of Arts, Heritage, Gaeltacht, and the Islands. 1999b. Policy and Guidelines on Archaeological Excavation. Government Publications Office, Dublin.

Dowd, M., Carden, R., 2016. 'First evidence of a Late Upper Palaeolithic human presence in Ireland.' Quaternary Science Reviews 139: 158-163.

Environmental Protection Agency. 2015. Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Government Publications Office, Dublin.

Environmental Protection Agency. 2022. Guidelines on the Information to be Contained in Environmental Impact Statements. Government Publications Office, Dublin.

MacCotter, P. 2008 Medieval Ireland. Dublin: Four Courts Press.

Kehoe, H. 2003. Lucan -Palmerstown Pipeline, High level Water Supply Scheme, Archaeological Monitoring Report, Licence No. 02E1281. Unpublished report prepared by McCarthy Acer Consultants Ltd.

Hawkes, A. 2018. The Archaeology of Prehistoric Burnt Mounds in Ireland. Oxford. Archaeopress.

McIlreavy, D. 2023. Archaeological Assessment at Gollierstown, Co. Dublin (Licence No. 23E0431). Unpublished report prepared by IAC Archaeology.

McErlean, T. 1983 "The Irish townland system of landscape organisation". In Reeves-Smyth, Terence; Hamond, Fred (eds) Landscape Archaeology in Ireland BAR British Series 116. pp. 315–39.

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. & Murphy, D. 2018. Geophysical Survey Report, Grange Castle Business Park West, Brownstown (Newcastle By.), Clutterland (Newcastle By.), Loughanstown Upper, Milltown (Newcastle By.) & Peamount Townlands, South County Dublin (Licence No. 18R0222). Unpublished report prepared by TARGET Archaeological Geophysics.

South County Dublin Development Plan 2022-2028.

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.

Stout, M. 2017. Early Medieval Ireland 431-1169. Bray. Wordwell.

Waddell, J. 2022. The Prehistoric Archaeology of Ireland, Galway University Press.

Warren, G. 2022. Hunter-Gatherer Ireland: Making Connections in an Island World. Oxford. Oxbow Ltd.

CARTOGRAPHIC SOURCES

Down Survey Maps of the Barony of Newcastle, c. 1655

Rocque's An Actual Survey of County Dublin, 1760

John Taylor's Map of the County of Dublin, 1816

Ordnance Survey Maps of Dublin, 1843-1906-09

ELECTRONIC SOURCES

www.buildingsofireland.ie – NIAH survey for County Dublin

www.excavations.ie – Summary of archaeological excavation from 1970–2023.

www.archaeology.ie – Department of Housing, Local Government and Heritage website listing all SMR/RMP/NIAH sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural, and natural heritage.

www.googleearth.com – Satellite imagery of the proposed development area.

www.bingmaps.com – Satellite imagery of the proposed development area.

www.booksulster.com/library/plnm/placenamesC.php - Contains the text from Irish Local Names Explained by P.W Joyce (1870).

Appendices

APPENDIX 15.1: ARCHAEOLOGICAL TESTING REPORT

APPENDIX 15.2: LEGISLATION PROTECTING THE ARCHAEOLOGICAL RESOURCE

PROTECTION OF CULTURAL HERITAGE

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht, and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

THE ARCHAEOLOGICAL RESOURCE

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act* 1997 are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

OWNERSHIP AND GUARDIANSHIP OF NATIONAL MONUMENTS

The Minister 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.

REGISTER OF HISTORIC MONUMENTS

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months' notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

PRESERVATION ORDERS AND TEMPORARY PRESERVATION ORDERS

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.

RECORD OF MONUMENTS AND PLACES

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht, and the Islands (now the Minister for the Department of Housing, Local Government and Heritage) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that 'where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice'.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989*, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological, and built heritage resources. These document's recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

THE PLANNING AND DEVELOPMENT ACT 2000

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

South Dublin County Council Development Plan 2022-2028

South County Dublin contains a large number of buildings, structures, and sites of architectural, historic and/or artistic importance, in addition to numerous archaeological sites. This significant archaeological and architectural heritage is a valuable resource adding to the historical and cultural character of the County. The Development Plan contains policies which are intended to ensure the protection of this heritage. Village Design Statements can be utilised as a tool to guide development in smaller centres. It should be noted that archaeological sites and archaeological zones of interest are identified by a recorded monument reference number on the land use zoning maps. The recorded monument reference numbers are taken from the Record of Monuments and Places for Dublin, published by Department of the Environment, Heritage, and Local Government.

Policy NCBH13: Archaeological Heritage

Manage development in a manner that protects and conserves the Archaeological Heritage of the County and avoids adverse impacts on sites, monuments, features, or objects of significant historical or archaeological interest.

NCBH13 Objective 1:

To favour the preservation in-situ of all sites, monuments, and features of significant historical or archaeological interest in accordance with the recommendations of the Framework and Principles for the Protection of Archaeological Heritage, DAHGI (1999), or any superseding national policy document.

NCB13 Objective 2:

To ensure that development is designed to avoid impacting on archaeological heritage including previously unknown sites, features, and objects.

NCBH13 Objective 3:

To protect and enhance sites listed in the Record of Monuments and Places and ensure that development in the vicinity of a Recorded Monument or Area of Archaeological Potential does not detract from the setting of the site, monument, feature, or object and is sited and designed appropriately.

NCBH13 Objective 4:

To protect and preserve the archaeological value of underwater archaeological sites including associated features and any discovered battlefield sites of significant archaeological potential within the County.

NCBH13 Objective 5:

To protect historical burial grounds within South Dublin County and encourage their maintenance in accordance with conservation principles.

APPENDIX 15.3: LEGISLATION PROTECTING THE ARCHITECTURAL RESOURCE

The main laws protecting the built heritage are the *Architectural Heritage (National Inventory)* and National Monuments (Miscellaneous Provisions) Act 1999 and the Local Government (Planning and Development) Acts 1963–1999, which has now been superseded by the Planning and Development Act, 2000. The Architectural Heritage Act requires the Minister to establish a survey to identify, record and assess the architectural heritage of the country. The background to this legislation derives from Article 2 of the 1985 Convention for the Protection of Architectural Heritage (Granada Convention). This states that:

> *For the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member state will undertake to maintain inventories of that architectural heritage.*

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligation under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architecture of Ireland (NIAH Handbook 2005:2). As inclusion in the inventory does not provide statutory protection, the survey information is used in conjunction with the *Architectural Heritage Protection Guidelines for Planning Authorities* to advise local authorities on compilation of a Record of Protected Structures as required by the *Planning and Development Act, 2000.*

PROTECTION UNDER THE RECORD OF PROTECTED STRUCTURES AND COUNTY DEVELOPMENT PLAN

Structures of architectural, cultural, social, scientific, historical, technical, or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the act. This act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1st January 2000.

The act provides for the inclusion of Protected Structures into the planning authorities' development plans and sets out statutory regulations regarding works affecting such structures. Under new legislation, no distinction is made between buildings formerly classified under development plans as List 1 and List 2. Such buildings are now all regarded as 'Protected Structures' and enjoy equal statutory protection. Under the act the entire structure is protected, including a structure's interior, exterior, attendant grounds and also any structures within the attendant grounds.

The act defines a Protected Structure as (a) a structure, or (b) a specified part of a structure which is included in a Record of Protected Structures (RPS), and, where that record so indicates, includes any specified feature which is in the attendant grounds of the structure, and which would not otherwise be included in this definition. Protection of the structure, or part thereof, includes conservation, preservation, and improvement compatible with maintaining its character and interest. Part IV of the act deals with architectural heritage, and Section 57 deals specifically with works affecting the character of Protected Structures or proposed Protected Structures and states that no works should materially affect the character of the structure or any element of the structure that contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest. The act does not provide specific criteria for assigning a special interest to a structure. However, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field workers as to

how to designate a building with a special interest, which are not mutually exclusive. This offers guidance by example rather than by definition:

Archaeological

It is to be noted that the NIAH is biased towards post-1700 structures. Structures that have archaeological features may be recorded, providing the archaeological features are incorporated within post-1700 elements. Industrial fabric is considered to have technical significance and should only be attributed archaeological significance if the structure has pre-1700 features.

Architectural

A structure may be considered of special architectural interest under the following criteria:

- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- A structure that makes a positive contribution to a setting, such as a streetscape or rural setting
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well-designed decorative features, externally and/or internally

Historical

A structure may be considered of special historical interest under the following criteria:

- A significant historical event associated with the structure
- An association with a significant historical figure
- Has a known interesting and/or unusual change of use, e.g. a former workhouse now in use as a hotel
- A memorial to a historical event.

Technical

A structure may be considered of special technical interest under the following criteria:

- Incorporates building materials of particular interest, i.e. the materials or the technology used for construction
- It is the work of a known or distinguished engineer
- Incorporates innovative engineering design, e.g. bridges, canals, or mill weirs
- A structure which has an architectural interest may also merit a technical interest due to the structural techniques used in its construction, e.g. a curvilinear glasshouse, early use of concrete, cast-iron prefabrication.
- Mechanical fixtures relating to a structure may be considered of technical significance.

Cultural

A structure may be considered of special cultural interest under the following criteria:

- An association with a known fictitious character or event, e.g. Sandycove Martello Tower, which featured in Ulysses.
- Other structure that illustrate the development of society, such as early schoolhouses, swimming baths or printworks.

Scientific

A structure may be considered of special scientific interest under the following criteria:

- A structure or place which is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g. Mizen Head Bridge, Birr Telescope.

Social

A structure may be considered of special social interest under the following criteria:

- A focal point of spiritual, political, national, or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.
- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

Artistic

A structure may be considered of special artistic interest under the following criteria:

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well-designed mass-produced structures or elements may also be considered of artistic interest.

From the NIAH Handbook 2003 & 2005 pages 15–20)

The Local Authority has the power to order conservation and restoration works to be undertaken by the owner of the protected structure if it considers the building to need repair. Similarly, an owner or developer must make a written request to the Local Authority to carry out any works on a protected structure and its environs, which will be reviewed within three months of application. Failure to do so may result in prosecution.

South Dublin County Council Development Plan 2022-2028

It is the Policy of Dublin City Council:

Policy NCBH19:

Protected Structures Conserve and protect buildings, structures and sites contained in the Record of Protected Structures and carefully consider any proposals for development that would affect the setting, special character or appearance of a Protected Structure including its historic curtilage, both directly and indirectly.

Objective 1: To ensure the protection of all structures (or parts of structures) and their immediate surroundings including the curtilage and attendant grounds of structures identified in the Record of Protected Structures.

Objective 2: To ensure that all development proposals that affect a Protected Structure and its setting including proposals to extend, alter or refurbish any Protected Structure are sympathetic to its special character and integrity and are appropriate in terms of architectural treatment, character, scale, and form. All such proposals shall be consistent with the Architectural Heritage Protection Guidelines for Planning Authorities, DAHG (2011 or any superseding documents) including the principles of conservation.

Objective 3: To address dereliction and to welcome, encourage and support the rehabilitation, renovation, appropriate use and sensitive re-use of Protected Structures consistent with RPO 9.30 of the RSES.

Objective 4: To support alternative uses for Protected Structures including former institutional sites in order to provide continued security of the heritage value of these buildings, attendant grounds, and associated landscape features. To this end, the relaxation of site zoning restrictions may be considered in order to secure the preservation and conservation of the protected structure where the use proposed is compatible with the existing structure and where the proposed development is consistent with best practice conservation policies and the proper planning and sustainable development of the area.

Objective 5: To prohibit demolition and inappropriate alterations of Protected Structures unless in very exceptional circumstances.

Objective 6: To ensure that any works to upgrade the energy efficiency of Protected Structures and historic buildings are sensitive to traditional construction methods and materials and do not have a detrimental physical or visual impact on the structure. Regard should be had to the DAHG publication 'Energy Efficiency in Traditional Buildings' (2010).

Objective 7: To review the National Inventory of Architectural Heritage (NIAH) and update the Record of Protected Structures in accordance with any direct Ministerial recommendations.

Objective 8: To support the restoration of the Mill Race (RPS Ref. 007), recognising that it is in private ownership, from where it leaves the Liffey at Fonthill to where it enters the Mills area at Palmerstown having regard to the potential for biodiversity enhancements.

Objective 9: To investigate the merit of including the following on the Record of Protected Structures and where such merit is identified to undertake the necessary public consultation process under the Planning and Development Acts:

à Palmyra House, Whitechurch Road, Rathfarnham, Dublin 16. à Friarstown House and outbuildings, Bohernabreena, Co. Dublin D24 F890. à SIAC Bridge, Monastery Road, Clondalkin, Dublin 22. à Old Milestone on north-west side of Templeogue Road Set in front of the modern boundary wall of No. 211 Templeogue Road, Dublin 6W. à Fort (or Callaghan's) Bridge, Kiltipper / Friarstown Upper / Ballinascorney Lower, Dublin 24. à Granite Boundary Stone outside Nos. 50 / 52, Whitehall Road, Dublin 12. à Road sign Bothair An Racadair, Whitehall Road.