Category	2021 Kilotonnes CO_2eq	% of Total GHG emissions
F-gases	738	1.2%
Agriculture	23,097	37.5%
Total	**61,528**	**100%**

Effects as a result of 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, with 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 effects as a result of 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 effects 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, 2020b) 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, 2020b) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order 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, 2020b). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020b).

TII's Guidance document PE-ENV-01104 (TII, 2022a) 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, 2020a). 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 will be a substantial decrease of approximately 50% which is projected 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 affect 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 effect hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk

to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change effects and climate change adaptation analysis for infrastructure.

8.4. Potential Effects on Climate during Construction Phase

8.4.1. Greenhouse Emissions Gas Assessment

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

The unmitigated embodied carbon within the construction materials has been calculated. This calculation was based on the updated online TII Carbon tool (TII, 2022c), and the breakdown of the activities between the different phases of the proposed development has been assessed. As shown in Table 8-7, the assessment indicates that the key sources of GHG emissions are associated with the pre-construction site clearance and demolition, the embodied carbon associated with excavation, construction materials, energy use, transport and water usage. The majority of GHG emissions associated with the development are due to construction phase embodied carbon.

The proposed development is estimated to result in total GHG emissions of 4,176 tonnes embodied CO_2eq, equivalent to an annualised total of 0.0013% of Ireland's non-ETS 2030 target, 0.42% of the 2030 transport budget or 0.06% of the 2030 industry budget. Over the predicted 60-year lifespan the annualised emissions due to the initial construction phase of the proposed development is projected to reach, at most, 0.0002% of Ireland's non-ETS 2030 emissions target, 0.007% of the 2030 buildings (commercial and public) budget or 0.001% of the 2030 industry budget.

Table 8-6 – Construction Stage Greenhouse Gas Emissions

Stage	CO_2e Emissions (tonnes)	% Of Total
Pre-Construction	0.1	0.002%
Embodied Carbon	3,972	95.1%
Construction Activities	199.6	4.8%
Construction Waste	4.7	0.1%
All	4,176	100%
Averaging Time	% Of 2030 Buildings (Commercial and Public) budget	% Of 2030 Industry budget
Over 1 years:	0.42%	0.06%
Over 60 years:	0.007%	0.001%

8.4.2. Climate Change Vulnerability Assessment

Examples of potential climate effects during operation are included in Annex D (Climate proofing and environmental effect assessment) of the technical guidance on the climate proofing of infrastructure (European Commission, 2021a). Potential effects of climate change of the proposed development 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.

During the construction phase consideration will be given to the project's vulnerability to climate effects. 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.

8.5. Potential Effects on Climate during Operational Phase

8.5.1. Greenhouse Emissions Gas Assessment

As there is the potential for a number of emissions of GHGs to the atmosphere during the operational phase of the development the traffic effect was reviewed and assessed against the guidance discussed in Section 0. As the operational stage traffic did not meet the screening criteria, a detailed climate assessment of operational stage traffic emissions was screened out.

There is no significant land use change associated with the proposed development as the land is currently developed.

It can be concluded that operational greenhouse gas emissions will have a long-term, minor adverse and non-significant effect on climate.

8.5.2. Climate Change Vulnerability Assessment

In order 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. Wildfire and landslides were not considered relevant to the proposed development due to the project location and have been screened out of the assessment.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. Table 8-7 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, the likelihood of the climate hazard occurring at the project location 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 8-7. The results of the vulnerability assessment are detailed in below.

Table 8-7 – Climate Change Vulnerability Assessment

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

The proposed development has a worst-case low vulnerability to flooding, extreme heat and extreme cold. The Flood Risk Assessment (FRA) for the Customs and Border Protection (CBP) extension was carried out by Nicholas O'Dwyer Ltd and submitted with this planning application states that "*based on the results of the FEMFRAM study, the CBP Project Boundary is not susceptible to flooding during the 1% Annual Exceedance Probability (AEP) and the 0.1% AEP*". The FRA report for the Flight Catering Building (FCB) submitted by AECOM states that "*the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and will contain the 1 in 100-year event plus 20% climate change allowance*". Further details are provided in Chapter 12: Water. Therefore, flooding on site is not a significant risk.

In relation to extreme temperatures, both extreme heat and extreme cold, these have the potential to effect the building materials and some related infrastructure. However, high quality, durable building materials will be

selected for the proposed development to ensure they robustly can tolerate temperature extremes. Therefore, extreme temperatures are not considered a significant risk.

8.6. Mitigation Measures

8.6.1. Construction Stage

The Institute of Environmental Management and Assessment (IEMA) guidance note on "Assessing Greenhouse Gas Emissions and Evaluating their Significance" (IEMA 2022) states that the crux of significance regarding effect on climate 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. Mitigation has taken a leading role within the Guidance compared to the previous edition published in 2017 (IEMA, 2017). Early engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings. As well as stakeholders, key points of engagement include the design team and client who have a significant role to play in the reduction of GHG emissions.

The following guidance has been used when considering mitigation and resilience with respect to climate risk:

- IEMA EIA Guide to: Climate Change Resilience and Adaptation (IEMA, 2020a);
- Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a);
- Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change (European Commission, 2021b); and
- PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a).

Mitigation by way of monitoring of the embodied carbon in the construction and operational phases will be conducted. The aim of the monitoring will be to seek further ways to minimise climate effects. Monitoring will include; embodied carbon of construction materials, water usage, power and fuel usage and waste generation and management (including reuse and recycling rates). Where monitoring shows the proposed development is not meeting its targets, (set based on final design and current national and regional best practice) further mitigation will be put in place.

During the construction phase vehicles, generators etc., will give rise to some GHG emissions, however the proposed development's effect on climate due to traffic can be minimised through mitigation measures. The following mitigation measures will be put in place to minimise emissions:

- Implement a policy which prevents idling of vehicles both on and off-site including HGV holding sites;
- Construction Phase traffic shall be monitored to ensure construction vehicles are using the designated haul routes;
- All plant and machinery will be maintained and serviced regularly;
- Efficient scheduling of deliveries will be undertaken to minimise emissions; and
- Construction vehicles shall conform to the latest EU emissions standards and where reasonably practicable, their emissions should meet upcoming standards prior to the legal requirement date for the new standard. This will ensure emissions on haul routes are minimised.

8.6.2. Operational Stage

A number of measures have been incorporated into the design of the development in order to mitigate against the effects of future climate change. For example, adequate attenuation and improved drainage have been incorporated into the design of the development to avoid potential flooding effects as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see Section 8.5.2).

The proposed development has been designed to reduce the effect on climate as a result of energy usage during operation. Measures included in the proposed development to reduce the effect to climate from energy usage are:

- The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards.
- A renewable energy rating (RER) of 20% will be achieved to comply with the Building Regulations (Part L Amendment) Regulations (S.I. No. 538 of 2017).
- A Building Energy Rating (BER) of A2/A3 is being targeted.

- Improved building thermal transmittance (U-Values), air permeability and thermal bridging.

These measures will aid in reducing the effect to climate during the operational phase of the proposed development in line with the goals of the Fingal Development Plan 2023 – 2029 and Climate Change Action Plan.

8.7. Residual Effects

8.7.1. Construction Stage

The proposed development with mitigation measures is estimated to result in total GHG emissions of 4,176 tonnes embodied CO_2eq, equivalent to an annualised total of 0.0013% of Ireland's non-ETS 2030 target, 0.42% of the 2030 transport budget or 0.06% of the 2030 industry budget. Over the predicted 60-year lifespan the annualised emissions due to the initial construction phase of the proposed development is projected to reach, at most, 0.0002% of Ireland's non-ETS 2030 emissions target, 0.007% of the 2030 buildings (commercial and public) budget or 0.001% of the 2030 industry budget. The significance criteria for effects (IEMA, 2022) states that the effect significance must be taken from the project as a whole over its lifecycle rather than individual phases.

The proposed development will result in some effects 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 is committing to reducing climate effects where feasible and the development will comply with the do-minimum standards set through regulation. As per the assessment criteria in Table 8-3 the effect of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant in EIA terms.

8.7.2. Operational Stage

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. Due to the nature of this development the effect on climate from the operational phase is predicted to be imperceptible, not significant and long-term. The increase in road vehicle traffic was scoped out for climate in accordance with the TII guidance. There will be no increase to air traffic as a result of the proposed development.

The proposed development will result in some effects 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"*. As per the assessment criteria in Table 8-3 the effect of the proposed development in relation to GHG emissions is considered long-term, minor adverse 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.

8.7.3. Worst Case Effect

Conservative assumptions have been made throughout the GHG assessment and climate change risk assessment. The effects reported in Sections 8.4, 8.4.2, 8.7.1 and 8.7.2 are therefore the worst case effects assessed.

8.7.4. Do-Nothing Effect

Under the Do Nothing Scenario no demolition or 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 8.3). This scenario is considered neutral in relation to climate.

8.8. Monitoring Requirements

8.8.1. Construction Stage

The assessment of effects on climate as a result of the construction, operation and maintenance and decommissioning phases of the proposed development are predicted to be not significant in EIA terms. Based on the predicted effects it is concluded that no additional monitoring beyond that given in Section 8.8.1 is required.

8.8.2. Operational Stage

The assessment of effects on climate as a result of the construction, operation and maintenance and decommissioning phases of the proposed development are predicted to be not significant in EIA terms. Based on the predicted effects it is concluded that no specific monitoring is required.

8.9. Difficulties Encountered

Data utilised in the GHG assessment are conservative estimates at this stage of the proposed development, with some uncertainty in the availability of lower embodied carbon materials – further embodied carbon minimisation may be possible during detailed design.

8.10. Cumulative Effects

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022a) states that *"for GHG Assessment is the global climate and effects 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 effect 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.

9. Noise & Vibration

9.1. Introduction

This chapter presents an assessment of the impacts of the proposed reconfiguration and partial demolition of US Customs and Border Protection, and South Apron Support Centre (SASC) at Dublin Airport in terms of Noise and Vibration on the local environment as defined in the Environmental Protection Agency's (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). A full description of the proposed works can be found in Chapter 2 – Project Description.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the likely noise and vibration effects associated with the proposed development, during both the short-term construction phase and the long-term operational phase, on the surrounding environment. The assessment of direct, indirect, and cumulative noise and vibration effects on the surrounding environment has been considered in this chapter.

Mitigation and monitoring measures are included, where relevant, to ensure the proposed development is constructed and operated in a manner that ensures minimal impact on the receiving environment and receptors.

9.2. Statement of Authority

This chapter has been prepared by Alistair Maclaurin. Alistair holds a BSc in Creative Music and Sound Technology and a Diploma in Acoustics and Noise Control. He is a member of the Institute of Acoustics (MIOA). Alistair has worked in the field of acoustics since 2012. He has been the lead noise consultant across various sites on major infrastructure projects in the UK such as Crossrail and Thames Tideway Tunnel, specialising in construction noise assessment and control. Additionally, he has undertaken various environmental noise assessments for infrastructure developments and planning reports.

9.3. Methodology

The study has been undertaken using the following methodology:

- Baseline noise monitoring has been undertaken in accordance with ISO 1996-2:*2017 Acoustics - Description, Measurement and Assessment of Environmental Noise - Determination of Sound Pressure Levels* in the vicinity of the proposed project and sensitive receptors in order to characterise the existing noise environment;
- A review of the 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 project, these are discussed in the relevant sections;
- Predictive calculations have been performed during the construction phase of the project at the nearest sensitive locations to the proposed construction site;
- A review of operational phase impacts has been undertaken;
- Determining significance criteria for impact assessment;
- A schedule of mitigation measures has been proposed to avoid, reduce or offset, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development.

9.3.1. Construction Noise Criteria

9.3.1.1. Residential Receptors

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.

In the absence of specific local guidance, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS5228-1:2009+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 existing ambient noise levels in the absence of construction noise. This sets a threshold noise value that, if exceeded at this location, indicates that a potential significant noise impact is associated with the construction activities, depending on context. It should be noted that this assessment method is only valid for residential properties.

BS 5228-1: 2009+A1:2014 sets out guidance on Construction Noise Thresholds (CNTs) relative to the existing noise environment. **Table 9-1** sets out the threshold values which, when exceeded, signify a potential significant effect at the façades of residential receptors as recommended in BS5228.

For the appropriate periods (*i.e.*, daytime, evening and night-time) the ambient noise level is determined and rounded to the nearest 5 decibels (dB). If the construction noise level exceeds the appropriate category value, then a significant effect is deemed to occur.

Table 9-1 - ABC construction noise thresholds

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

[A]Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[B]Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[C]Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

In order to assist with interpretation of significance, Table 9-2 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 has been adapted for the purposes of this Chapter 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 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.

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

Table 9-2 - Likely Impact due to Construction Noise

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 [Note 1]	
Above CNT and below or equal to CNT +5 dB [Note 2]	Moderate	Moderate to Significant	
Above CNT +5 and below or equal to CNT +15 dB	Major	Significant, to Very Significant	
Above +15 dB		Very Significant to Profound	

Note 1: 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'.

Note 2: 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 +20 dB are categorised as Profound.

9.3.1.2. Commercial Receptors

BS5228-1:2009+A1 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".*

For non-residential locations it is considered appropriate to adopt the 75dB(A) criterion during the day.

9.3.1.3. Construction Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: DMRB Noise and Vibration 2020 and the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB document. Table 9-3 offers guidance as to the likely impact associated with any change in traffic noise level (Source DMRB, 2020).

Table 9-3– Likely impact associated with change in traffic noise level due to additional construction traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

9.3.2. Construction Vibration Criteria

Vibration standards are generally split into two categories, those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- 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.

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 structurally unsound 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.

For utilities and underground services BS5228-1:2009+A1:2014 recommends a maximum of 30 mm/s PPV. If the utilities or underground services are noted to be structurally unsound, then the PPV value should be reduced by up to 50% depending on the condition.

9.3.3. Operational Plant Noise Criteria

British Standard 4142:2014+A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound* describes methods for rating and assessing the impact of sound from an industrial and/or commercial development to a residential receptor. The methods described in this 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. The results of baseline surveys of the prevailing background sound level (L_{A90}) allow for the noise impact associated with the development to be assessed. With reference to BS 4142:2014, it is noted that, depending on context, adverse impacts are likely to occur when the rated specific sound level exceeds the prevailing background sound level by +5 dB, with a significant adverse impact occurring at +10 dB or more. Where the rating level does not exceed the background sound level, BS 4142 comments that this is an indication of the specific sound source having a low impact, again depending on the context.

Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS 4142:2014+A1:2019 advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142:2014+A1:2019 recommends the application of a 2 dB penalty for a tone which is just perceptible at the receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible. In relation to intermittency, BS 4142:2014+A1:2019 recommends that if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied where it is just perceptible at the receptor location to 9 dB where it is highly perceptible.

In terms of this development, in accordance with the guidance provided in BS4142:2014+A1:2019, if the noise from the developed facility alone does not exceed the existing background noise level, then this is an indication of the noise emissions from the facility having a low impact. Adverse impacts are predicted to occur when the background noise level is exceeded by more than 5dB.

The measured noise levels at receptors are presented in Section 9.5.5. In the case of the sensitive receptors located on the R108 the average background noise level has been measured as 53 dB $L_{A90,1hr}$ during the day period and 45 dB $L_{A90,15mins}$ during the night period, and for properties on the R132 the average background noise level has been measured as 63 dB $L_{A90,1hr}$ during the day period and 58 dB $L_{A90,15mins}$ during the night period therefore the following noise criteria are adopted:

Noise emissions from site operations will be constrained to the following noise levels at residential receptors.

- Daytime: ≤ 55 dB $L_{Aeq,1hr}$
- Night-time: ≤ 45 dB $L_{Aeq,15min}$

Note that notwithstanding the presentation of criteria here, all operational plant is either situated underground or does not produce noise emissions, hence an assessment of operational noise is not required. Nonetheless, it must be ensured at the design stage that any plant installed as part of the project must meet the noise criteria set out above.

9.3.3.1. Fingal Development Plan Policy on Aircraft Noise

Fingal Development Plan 2023-2029 Objective DAO11 outlines Noise Zones and policy objectives in relation to aircraft noise from Dublin Airport.

Four noise zones (Zone A to D) are now indicated representing potential site exposure to aircraft exposure. The council will actively resist noise sensitive developments within Zone A and resist in Zone B and C pending independent acoustic advice and mitigation measures. Certain specific residential developments located in Zone D may be required to demonstrate that aircraft noise intrusion has been considered in the design.

The development in this instance is located within Zone A.

Table 9-4 - Objectives to be adhered to by applicants for developments in each zone.

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
D	≥ 50 dB and < 54 dB LAeq, 16hr and	To identify noise sensitive developments which could potentially be affected by aircraft noise and to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment.

	≥ 40 and < 48 dB Lnight	All noise sensitive development within this zone is likely to be acceptable from a noise perspective. An associated application would not normally be refused on noise grounds, however where the development is residential-led and comprises non-residential noise sensitive uses, or comprises 50 residential units or more, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed. Applicants are advised to seek expert advice.
C	≥ 54 dB and < 63 dB $L_{Aeq, 16hr}$ And ≥ 48 dB and < 55 dB L_{night}	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise insulation is incorporated within the development Noise sensitive development in this zone is less suitable from a noise perspective than in Zone D. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed. The noise assessment must demonstrate that relevant internal noise guidelines will be met. This may require noise insulation measures. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants are strongly advised to seek expert advice.
B	≥ 54 dB and < 63 dB $L_{Aeq, 16hr}$ And ≥ 55 dB L_{night}	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure noise insulation is incorporated within the development. Noise sensitive development in this zone is less suitable from a noise perspective than in Zone C. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed. Appropriate well-designed noise insulation measures must be incorporated into the development in order to meet relevant internal noise guidelines. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants must seek expert advice.
A	≥ 63 dB $L_{Aeq, 16hr}$ And/or ≥ 55 dB L_{night}	To resist new provision for residential development and other noise sensitive uses. All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted.

Notes:

- 'Good Acoustic Design' means following the principles of assessment and design as described in ProPG: Planning & Noise – New Residential Development, May 2017;
- Internal and External Amenity and the design of noise insulation measures should follow the guidance provided in British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

9.3.3.2. British Standard BS 8233

The next stage of the assessment relates to identifying appropriate internal noise criteria in relation to aircraft noise intrusion to the proposed development.

The *Noise Action Plan for the Agglomeration of Dublin* – Volume 3: Fingal County Council (2018 – 2023) and relevant guidance referenced therein call for developments to have a good level of sound insulation in accordance with best Irish practice. There is no Irish standard guidance that is directly applicable to this scenario, hence it is proposed to make reference to *BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings* for the purposes of arriving at appropriate design goals.

The British Standard *BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings* sets out recommended internal noise levels for several different building types from external noise sources such as road and air traffic. The guidance is primarily for use by designers, hence *BS8233* may be used as the basis for the development of an appropriate schedule of noise control measures.

The recommended indoor ambient noise level in a commercial building is as follows:

Table 9-5 – Typical Noise Levels in Non-Domesticated Buildings from BS8233: 2014

Activity	Location	Design range dB $L_{Aeq,T}$
Speech or telephone communications	Department Store, Cafeteria, Canteen, Kitchen	50 – 55
Typical noise levels for acoustic privacy in shared spaces	Open Plan Office	45 – 50
Study and work requiring concentration	Meeting Room	35 – 45

Based on a review of the BS 8233 standard it is recommended that intrusive noise levels from external noise be controlled such that the noise level does not exceed the range of 45 to 50 dB $L_{Aeq,15min}$.

9.3.4. Additional Traffic on Public Roads

There will be no additional traffic on public roads as a result of the operational stage of this project, hence there is no requirement for criteria or further consideration of this element in the assessment.

9.4. Receiving Environment

The prevailing noise environment surrounding the proposed development site is dominated by aircraft take-off and landing at Dublin Airport and road traffic along the surrounding road network. Other sources in the environment include activities within the Dublin Airport campus (aircraft and vehicle ground movements etc.).

9.4.1. Receptor Locations

In the first instance, it is important to identify the nearest noise sensitive receptors to the proposed development. Figure 9-1 provides an overview of the closest areas to the proposed development which have the potential to be impacted. A description of each group of noise-sensitive locations is presented in Table 9-7.

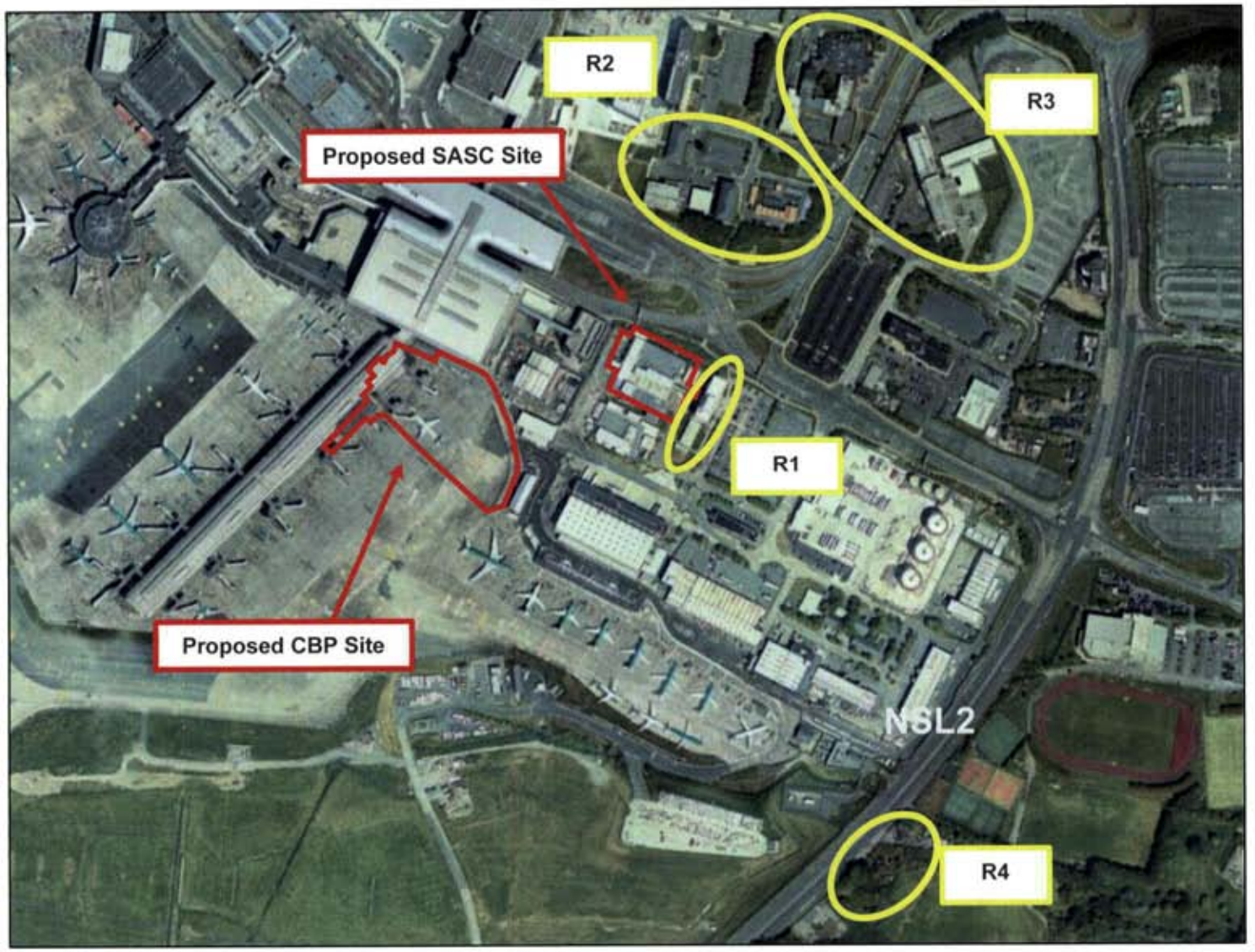


Figure 9-1 - Overview of Dublin Airport with reference locations.

Table 9-6 – Nearest Receptors

Receptor	Description	Distance to Proposed Works
R1	Aer Lingus offices attached by raised walkway to east façade of SASC and northeast of CBP	35m
R2	Aer Lingus training facility located directly north of SASC and CBP	150m
R3	Commercial properties, two hotels, situated within Dublin Airport to north of SASC and CBP	300m
R4	Residential properties situated on R132 road, to south of CBP and SASC	750m

9.5. Noise Survey

An environmental noise survey has previously been conducted by AWN Consulting for other construction projects at Dublin Airport in similar locations, the survey is considered to remain relevant for this project and is reproduced below. The survey was conducted in general accordance with ISO 1996-2:2017 *Acoustics - Description, Measurement and Assessment of Environmental Noise - Determination of Sound Pressure Levels*. Specific details are set out in the following sections.

9.5.1. Measurement Locations

Five survey locations were selected to determine the prevailing noise climate in the vicinity of the proposed development and the identified receptors with potential to be impacted by the proposed development. All survey locations are presented in **Error! Reference source not found.**-2 and **Error! Reference source not found.**-3, and are discussed in the following sections. Note that NML2 was not accessible during the evening and night period, hence a proxy location (NML2') was identified for those measurements.

Figure 9-2 - Noise monitoring locations 1 to 3

Figure 9-3- Noise monitoring locations 4 and 5

9.5.2. Survey Periods

Attended noise measurements were conducted across the locations during the day of 23rd November 2022 and during the day and night of 28th November 2022. During the survey periods the weather was noted to be calm and dry and did not have a negative impact on measured noise levels.

9.5.3. Instrumentation

Measurements were made using Brüel and Kjaer 2250 Light Sound Level Meters. Sample periods were set to 15-minutes.

Before and after the survey the measurement instruments were calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

9.5.4. Measurement Parameters

The noise survey results are presented in terms of the following 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. It is typically used as a descriptor for ambient noise.

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 pressure level recorded during the sample period.

The 'A' suffix denotes the fact that the sound levels have been 'A-weighted' in order 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.

9.5.5. Results

9.5.5.1. Location NML1

Table 9-7 - Noise measurement results for NML1

Date	Time	L_{Aeq}	L_{Amax}	L_{A90}
23/11/2022	14:29	60	78	51
23/11/2022	15:36	58	79	50
23/11/2022	16:52	57	76	52
28/11/2022	21:36	54	76	41
28/11/2022	22:59	55	75	39

At this location the subjective noise character was described as comprising distant road traffic, aircraft movement overhead, bird song and rustling vegetation.

9.5.5.2. Location NML2

Table 9-8 – Noise measurement results for NML2

Date	Time	L_{Aeq}	L_{Amax}	L_{A90}
23/11/2022	14:49	62	83	53
23/11/2022	16:01	65	85	54
23/11/2022	17:12	69	91	55
28/11/2022	21:55	63	81	41
28/11/2022	23:19	63	79	45

At this location the subjective noise character was described as comprising distant road traffic, aircraft movement overhead, aircraft taxi movements, bird song and rustling vegetation.

9.5.5.3. Location NML3

Table 9-9 – Noise measurement results for NML3

Date	Time	L_{Aeq}	L_{Amax}	L_{A90}
23/11/2022	15:10	62	77	54
23/11/2022	16:22	62	81	53
23/11/2022	17:37	64	81	53
28/11/2022	22:13	61	81	47
28/11/2022	23:37	53	74	41

At this location the subjective noise character was described as comprising distant road traffic, aircraft movement overhead and occasional local road traffic movements.

9.5.5.4. Location NML4

Table 9-10 – Noise measurement results for NML4

Date	Time	L_{Aeq}	L_{Amax}	L_{A90}
23/11/2022	11:12	75	87	52
23/11/2022	12:05	75	87	52
23/11/2022	13:08	76	92	55
28/11/2022	21:33	74	90	55
28/11/2022	23:01	75	93	51

At this location the subjective noise character was described as comprising constant local road traffic, aircraft movement overhead and aircraft taxi movements.

9.5.5.5. Location NML5

Table 9-11 – Noise measurement results for NML5

Date	Time	L_{Aeq}	L_{Amax}	L_{A90}
23/11/2022	10:38	75	91	65
23/11/2022	11:37	74	90	63
23/11/2022	12:31	74	90	62
28/11/2022	22:00	74	94	59
28/11/2022	23:26	75	94	59

At this location the subjective noise character was described as comprising constant local road traffic, aircraft movement overhead and aircraft taxi movements.

9.6. Potential Impacts of the Proposed Development

9.6.1. Construction Noise

9.6.1.1. Adopted Construction Noise Thresholds

Given the measured baseline noise levels presented in Section 9.5.5 construction noise thresholds have been calculated as per the criteria in Section 9.3.1 for each NSL and are presented in Table 9-12.

Table 9-12 –Construction Noise Thresholds

Reference	Construction Noise Threshold		
	Day	Evening	Night
R1	75	--	--
R2	75	--	--
R3	75	65*	55*
R4	75	65*	55*

*Note that measured baseline noise levels are far in excess of these designated thresholds, however, given that the nature of the noise environment primarily comprises intermittent aircraft movements it is considered prudent to set limits in line with the experienced noise levels between aircraft movements.

9.6.1.2. Airborne Construction Noise Predictions for Construction Phases

A proposed construction program has been produced for the project that identifies work areas and proposed plant equipment during the different phases of work. It is possible to predict typical indicative construction noise levels using guidance set out in BS 5228-1: 2009+A1:2014.

Table 9.13 outlines typical plant items that may be used during the construction phase and includes associated noise levels at 10 m which are reproduced from BS 5228-1: 2009+A1:2014. Table 9-13 presents predicted construction noise levels for various distances during each phase of the construction works, without the application of mitigation. Ground type has been calculated as mixed. Note that the calculations assume all plant to be located on the closest boundary of the works, this is a worst-case assumption.

Table 9-13 – Construction noise predictions

Phase	Item of Plant	Data Reference 5228-1:2009	% On Time	Construction Noise L_{Aeq} at Various Distances (dB)				
				10m	35m	70m	100m	200m
Partial Demolition of South Apron Support Centre Building	Excavator	C.1:2	67	92	80	73	70	63
	Concrete Crushing Plant	C.9:14	67	87	75	68	65	58

	Dumper	C.4:7	67	78	66	59	56	49
	MEWPs	C.4:57	67	67	55	48	45	38
	Waste Disposal Wagons	C.8:19	67	78	66	59	56	49
Overall $L_{Aeq\ (12hr)}$				**94**	**82**	**75**	**72**	**65**
SASC Construction Works	Excavator	C.2:5	67	76	64	57	54	47
	Dumper	C.4:7	67	76	64	57	54	47
	Roller	C.5:20	67	75	63	56	53	46
	Mobile Cranes	C.5:37	67	76	64	57	54	47
	MEWPs	C.4:57	67	67	55	48	45	38
	Asphalt Laying Plant	C.5:30	67	75	63	56	53	46
	Waste Disposal Wagons	C.8:19	67	78	66	59	56	49
	Forklift/Telehandler	C.2:35	67	71	59	52	49	42
Overall $L_{Aeq\ (12hr)}$				**84**	**72**	**65**	**62**	**55**
Construction of Border Pre-Clearance Facility	Excavator	C.2:5	67	76	64	57	54	47
	Dumper	C.4:7	67	76	64	57	54	47
	Roller	C.5:20	67	75	63	56	53	46
	Mobile Cranes	C.5:37	67	76	64	57	54	47
	MEWPs	C.4:57	67	67	55	48	45	38
	Asphalt Laying Plant	C.5:30	67	75	63	56	53	46
	Waste Disposal Wagons	C.8:19	67	78	66	59	56	49
	Forklift/Telehandler	C.2:35	67	71	59	52	49	42
	Cement Mixer Truck with Concrete Pump	C.4:28	67	72	60	53	50	43
Overall $L_{Aeq\ (12hr)}$				**85**	**72**	**66**	**62**	**55**

The construction noise predictions indicate that commercial properties located within 70 m of works during the demolition phase have the potential to experience a significant effect. One commercial property has been identified within 70 m of the proposed works at R1, which is the Aer Lingus offices adjacent to the SASC, where a direct, negative, moderate to significant and temporary ieffect is predicted during the demolition phase. However, it should be noted that the demolition of the SASC building will be undertaken in a phased manner to reduce impacts on the Aer Lingus building. It is proposed that the demolition of the building commences on the west side of the building, leaving the eastern façade in place until the last phase of demolition. The eastern façade will act as an effective screen to the Aer Lingus building, hence demolition noise is expected to be reduced until this final phase, significantly reducing the duration of the impact on the Aer Lingus building. During all other construction phases the effect is predicted to be direct, negative, slight and temporary at commercial receptors.

The closest residential receptor is located approximately 700 m from the works. Comparison of the predicted noise levels with the adopted criteria indicates that the effect will be negative, not significant to slight and temporary at residential receptors.

9.6.1.3. Structure-borne Construction Noise Impacts

Dublin Airport and Pier 4 in particular will remain operational during the demolition and construction works, as will adjoining and adjacent commercial properties. Pier 4 and the current CBP building are adjoined, hence, there is the likelihood that structure borne noise and vibration will impact on the adjoined receptors during the demolition phase. However, it is understood that the demolition of the building itself will largely be accomplished with hand tools and unbolted from the remaining building, typically non-percussive methods will be employed. Given the proposed methodology a direct, negative, moderate and temporary effect is predicted for adjoining and adjacent commercial properties during the demolition phase. Note that it is proposed that an independent double stud wall will be constructed to separate the proposed demolition and construction area from the areas of the building that will remain in use. Whilst the wall will not reduce structure borne noise, it will reduce the airborne noise and hence, will likely reduce the subjective effects of the associated structure borne noise.

The SASC building is attached to the Aer Lingus offices by a raised walkway which is scheduled for demolition. It is understood that the demolition of the walkway will typically utilise non-percussive methods. Whilst it is expected that impacts will be reduced in comparison with the CBP building, it is still predicted that a direct, negative, brief to temporary, significant effect will occur during this activity at the Aer Lingus offices.

Mitigation measures will be employed to minimise the impact of works as much as is practicable.

9.6.2. Construction Vibration

In terms of vibration, during breaking and excavation there is potential for vibration to propagate through the ground. Empirical data for this activity is not provided in the BS 5228- 2:2009+A1:2014 standard, however the likely levels of vibration from this activity is expected to be significantly below the vibration criteria for building damage or utilities damage based on experience from other sites. In this instance it is proposed that concrete will be removed from the Apron area using saw cutting and lifting operations, removing or reducing the need for percussive methods. This methodology does not generate significant levels of vibration compared to percussive methods.

Given that the closest receptors may adjoin the works, there is the potential for a direct, negative, moderate, brief to temporary effect. Mitigation for vibration effects is presented in Section 9.7.1.7.

9.6.3. Construction Traffic

While the development will generate additional traffic flows during the construction phase, in order to increase traffic noise levels by 1 dB, traffic volumes would need to increase by the order of 25% approximately. Given the low levels of traffic required for this project this level of change is not likely to apply during this construction phase given the type of works being undertaken. Therefore, no mitigation measures are expected to be required in respect of additional traffic on surrounding roads. The additional traffic is predicted to produce a direct, neutral and not significant effect.

9.6.4. Operational Noise and Vibration

9.6.4.1. Outward Operational Noise

Operations as a result of these works are not expected to change and therefore there will be no perceptible difference to noise receptors.

9.6.4.2. Inward Operational Noise

The discussion in this section applies to the external façade of the proposed extension. In the context of sound insulation of a building façade the overall performance is determined by the composite acoustic performance of all elements of the façade (e.g. glazed elements, opaque elements, ventilation opening and solid masonry elements). In this instance given that the building is to be fully mechanically ventilated there are no natural ventilation opening being provided in the façade. Therefore, the acoustic performance will be determined largely by the weakest individual elements which in this case is the glazing and light-weight wall cladding.

To achieve appropriate intrusive noise level, the elements of the façade will need to offer a minimum level of sound insulation performance as summarized in Table 9-14.

Table 9-14 – Minimum Sound Reduction Indices for Façade Elements (R, dB)

Element	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
Glazed Elements	30	26	34	42	40	50	37
Cladding Elements	29	41	48	53	48	47	48

For the glazed elements this level of performance can be achieved using an appropriately selected high performance double glazed system. For illustrative purposes the specification is based on the following glass build-up,

8mm glass – 18mm cavity – 8mm toughened glass

Selecting the façade to provide the sound insulation values listed above will ensure that the internal ambient noise design goals discussed in Section 9.3.3.2 will be achieved. Note that this specification is indicative and will be confirmed at the detailed design stage to ensure that the internal criteria will be achieved, there are other combinations of glazing build-ups and façade designs that may also meet the internal noise criteria.

9.7. Mitigation

9.7.1. Construction Noise Mitigation

9.7.1.1. Communication with Neighbours

The Contractor will be proactive in engaging with the occupants of neighbouring properties with potential for construction impacts and will be obliged to notify them of any works forecast to generate appreciable levels of noise, explaining the nature and duration of the works.

A designated noise liaison will be appointed by the contractor for the duration of the construction works. This person should log any issues and follow up promptly.

9.7.1.2. Noise & Vibration Monitoring

The following ongoing noise monitoring programme is recommended for the site in relation to construction activities:

- One unattended noise meter installed near the boundary of the Aer Lingus Office Building.

Vibration meters should be installed in a secure location within the adjoining properties (i.e. the Aer Lingus building or the Dublin Airport pier) where possible, or in a suitable alternate location that can be used to gauge vibration impacts on the adjoining properties.

Note that these locations are yet to be confirmed, alternative locations may prove to be more suitable or practicable once the construction programme has been fully realised.

9.7.1.3. Noise Control Audits

It is recommended that noise control audits be conducted at regular intervals throughout the construction programme.

The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions. To this end, consideration should be given to issues such as the following (note that this list is not intended to be exhaustive):

- Hours of operation being correctly observed;
- Opportunities for noise control "at source";
- Optimum siting of plant items;
- Plant items being stopped when not in use;
- Correct use of proprietary noise control measures;
- Materials handling;
- Poor maintenance, and;
- Correct use of screening provided and opportunities for provision of additional screening.

9.7.1.4. Selection of Quiet Plant

Careful consideration will be given to the noise emission levels of plant items when they are being considered for use on the site. This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

9.7.1.5. Control of Noise Sources

If the use of low noise plant or replacing a noisy item of plant are not viable or practicable options, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods, often in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures that could be moved around site as necessary may also be used to screen operatives using hand tools such as angle grinders.

In practice, a balance may need to be struck between the use of all available techniques and the resulting costs of doing so. It is therefore proposed to adopt the concept of "Best Available Techniques" (BAT).

BAT is defined as follows in Directive 2010/75/EU:

> *'"...the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole."*

In this context "best" means "the most effective in achieving a high general level of protection of the environment as a whole".

The expression "available techniques" means "those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator".

The term "techniques" includes "includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned".

In specifying or otherwise determining BAT, consideration should be given to a specified list of considerations and also to "the likely costs and advantages of measures" as well as "the principles of precaution and prevention".

Thus, the concept of BAT requires a degree of balance between the attainment of environmental benefits and the likely cost implications. In the identification of BAT, regard should be had to a wide range of factors, however, emphasis should be given to "practical suitability" and the need "to reduce an emission and its impact on the environment as a whole".

Proposed techniques should also be evaluated in light of their potential effect on occupational health and safety.

BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are relevant and hence are reproduced below. These recommendations should be implemented on the site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.*
>
> *Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*

Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.

Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

The following outline guidance in relation to specific plant will also be considered:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers, rock drills and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For all materials handling ensure that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.
- Where practicable, metal on metal or rock on metal impacts should be avoided during night works. This can be achieved through the use of rubber mallets or impact linings etc. on site.
- White noise reverse alarms should be utilised on vehicles where practicable to reduce potential annoyance of tonal noise emissions from site, particularly during the more sensitive evening and night periods.

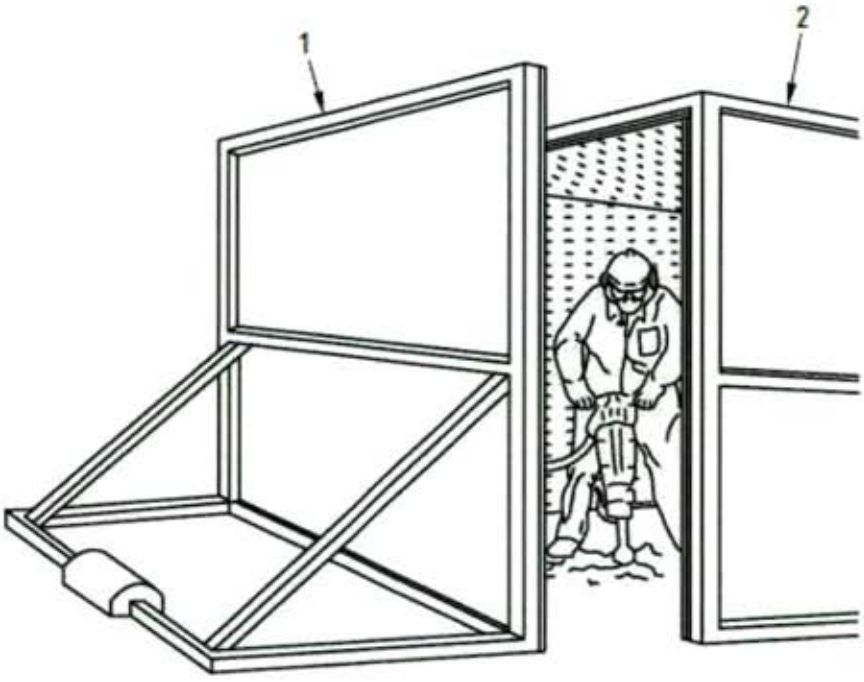
9.7.1.6. Screening

The use of screens can be effective in reducing the noise level at a receiver location and should be employed as a complementary measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. The height and length of any screen should, where practicable, be such that there is no direct line of sight between the source and the receiver.

BS5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the screen should be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the barrier rather than the transmission through the barrier itself. Screens constructed of materials with a surface mass greater than 10 kg/m typically offer adequate sound insulation performance.

Wherever practicable, at static sites, a 2.4 m site hoarding is installed at the perimeter of the site to screen line of sight from receptor to the source of the noise. Where construction works are more fluid and locations are not fixed, an effort should be made where practicable to use demountable screens to surround the site works to provide an element of screening to the surrounding receptors.

Annex B of BS5228 (Figures B1, B2 and B3) provides typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials. BS5228 Figure B2 is included here for information purposes.



Key
1 Acoustic screen 2 m wide and 2.7 m high
2 Acoustic shed 2 m square and 2.7 m high

Table B.4 **Measured sound reduction given by types of partial enclosure**

Type of enclosure (see Figure B.3)	Reduction dB(A)		
	Facing the opening(s)	Sideways	Facing rear of shed
Open-sided shed lined with absorbent material; no screen	1	9	14
Open-sided shed lined with absorbent material; with reflecting screen in front	10	6	8
Open-sided shed lined with absorbent material; with absorbent screen in front	10	10	10

Table 9-15 - Typical acoustic screen/shed detail

9.7.1.7. Construction Vibration Mitigation

Non percussive demolition methods are to be employed where practicable. Vibration from construction activities will be limited to the values set out in Section 9.3.2 to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values set out in Section 9.3.2.

9.7.2. Operational Stage Mitigation

9.7.2.1. Façade Sound Insulation Performance

To achieve appropriate intrusive noise level, the elements of the façade will need to offer a minimum level of sound insulation performance as summarized in Table 9-15.

Table 9-16 – Minimum Sound Reduction Indices for Façade Elements (R, dB)

Element	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
Glazed Elements	30	26	34	42	40	50	37
Cladding Elements	29	41	48	53	48	47	48

For the glazed elements this level of performance can be achieved using an appropriately selected high performance double glazed system. For illustrative purposes the specification is based on the following glass build-up,

8mm glass – 18mm cavity – 8mm toughened glass

Selecting the façade to provide the sound insulation values listed above will ensure that the internal ambient noise design goals discussed in Section 9.3.3.2 will be achieved. Note that this specification is indicative and will be confirmed at the detailed design stage to ensure that the internal criteria will be achieved, there are other combinations of glazing build-ups and façade designs that may also meet the internal noise criteria.

9.8. Residual Impacts

9.8.1. Construction Noise and Vibration

With mitigation the resultant noise effects during construction is calculated to be negative, negligible to slight and temporary at residential receptors and negative, moderate to significant and temporary effect at the nearest commercial buildings. Vibration effects at offsite residential receptors will be imperceptible. Vibration impacts at nearby commercial buildings will be a negative, brief, moderate impact.

9.8.2. Operational Noise and Vibration

No changes to operation will occur as a result of these works, hence there will be no additional noise and vibration effects due to the operational stage.

9.8.3. Do Nothing

In the case of a Do Nothing scenario the noise environment will remain unchanged.

9.9. Cumulative Impacts

9.9.1. Construction Noise and Vibration

Given the low levels of traffic associated with this development, and the large volumes of traffic associated with other developments within the local area it can be concluded that there will be no cumulative effect due to traffic movements from this project.

Due to the proximity and adjacency of other construction projects within the area there is the potential for cumulative effects should projects proceed simultaneously. Cumulative construction impacts will need to be considered and managed during the construction phase. Liaison between contractor teams on nearby sites will be on-going throughout the duration of the construction phase. Contractors will be obliged to schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative effects on nearby sensitive receptors.

9.10. Monitoring

Noise monitoring during the construction stage will be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise and BS5228. There is no monitoring recommended for the operational phase of the development as impacts due to noise and vibration are predicted to be not significant.

10. Traffic

daa have appointed Atkins Ireland Limited (Atkins) to prepare a traffic chapter as part of an EIAR for the proposed refurbishment of the South Apron Support Centre (SASC), and future development and extension of the Customs and Border Preclearance (CBP) at Dublin Airport, herein referred to as the 'proposed developments'.

This chapter seeks to provide a description of the outline methodology and anticipated traffic impact of the proposed development

This chapter includes an assessment of the cumulative impact of traffic generated during construction of the proposed developments.

10.1. Methodology

This traffic chapter has been prepared in accordance with European Union (Environmental Impact Assessment Directive (2011/92/EU as amended by 2014/52/EU) and European Union (Planning and Development) (Environmental Impact Assessment) Regulations and with due regard to the following EIAR guidance:

- Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' published in 2022;
- EPA 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)' published in September 2003;
- EPA Guidelines on the information to be contained in Environmental Impact Statements, 2002,
- European Commission (EC) 'Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017;
- EC 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)', published in 2017;and,
- Department of Housing, Local Government and Heritage (DoHPLG) 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' published in August 2018.
- Fingal County Council - Fingal Development Plan 2023 - 2029;
- Fingal County Council - South Fingal Transportation Study 2019;
- DAA - Dublin Airport Mobility Management Update 2019;
- Fingal County Council - Dublin Airport Local Area Plan 2020
- Transport Infrastructure Ireland - Traffic and Transport Guidelines 2014;
- Transport Infrastructure Ireland - Spatial Planning and National Roads 2012;
- Transport Infrastructure Ireland - Project Appraisal Guidelines (Related Units) 2016; and
- National Transport Authority - Transport Strategy for the Greater Dublin Area 2022 - 2042.

10.2. Receiving Environment

The site of the proposed development is located within the airport lands at Dublin Airport on the southern side of the complex and situated adjacent to the east side of the Terminal 2 building. The site location is shown in Figure 10-1 below.

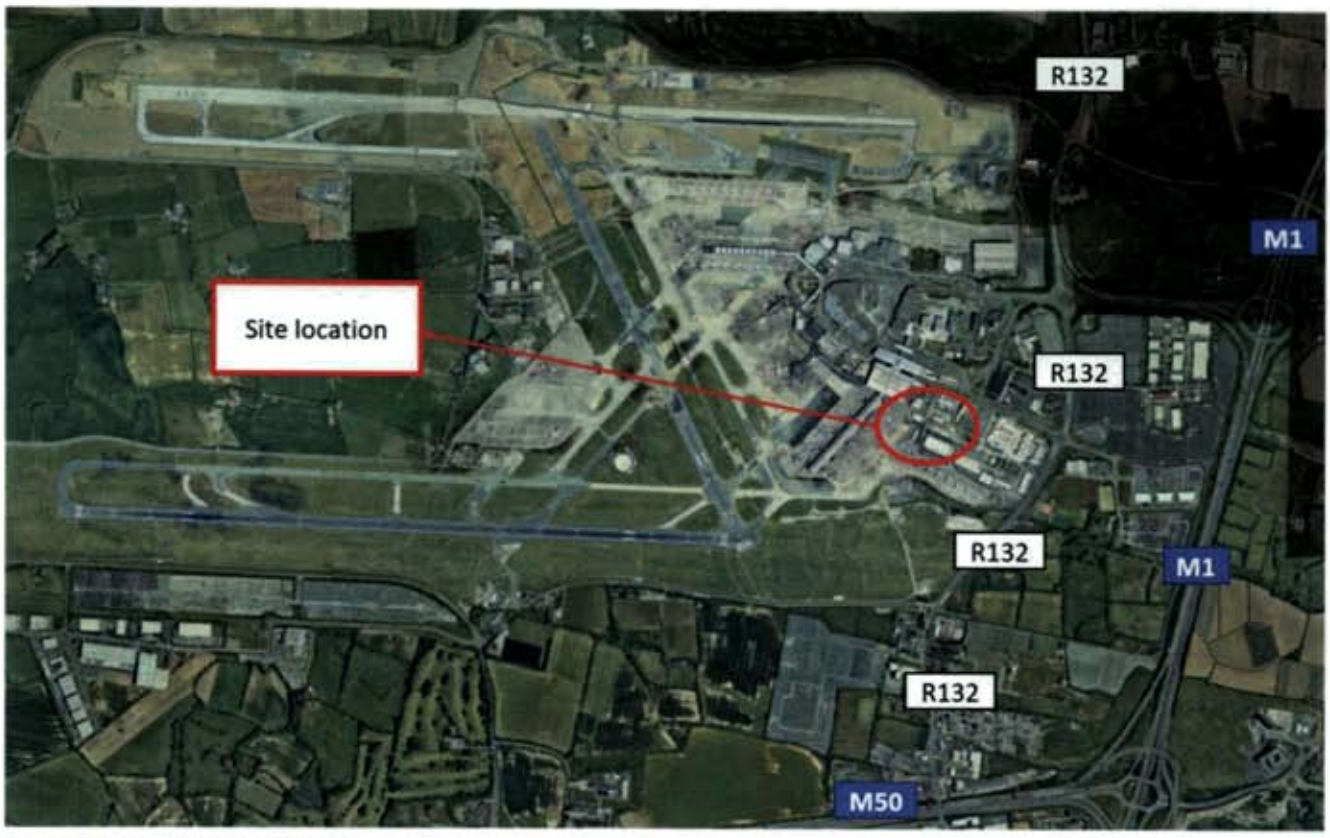


Figure 10-1 - Site Locations

According to Dublin Airport LAP (2020), the internal road network is connected to the external road network at three locations: junction of the R132 and the M1, i.e. the Airport Roundabout; junction of Corballis Road South and the R132; and via a minor access point from the Naul Road just west of the Cloghran Roundabout. A one-way traffic circulation system extends into the Dublin Airport campus from the two main access points on the R132. The network broadly features an outer loop serving T1 departures and surface car park and an inner loop serving T2 departures and surface car park. A bus lane is provided off the inner loop to the Ground Transportation Centre (GTC). Various airport land uses are enclosed within the perimeter formed by the internal road network. The exits from each of these areas lead back to the east-bound northern side of the internal road network and return to the Airport Roundabout.

Access to the site will be available through Corballis Road South/Corballis Park which directly interface with the regional road R132 and M1 Airport Motorway, as well as the M50 motorway.

Corballis Road South

Corballis Road South is the main airport link road connecting the Old Central Terminal building with the R132 and Eastland's Road crossing. It passes through both Terminal 2 and Terminal 1 buildings.

R132 Road

R132 regional road connects Dublin city centre from its crossing with Parnell Street and O'Connell Street, with Dundalk, and is 98.9 kilometres (61.5 miles) long. The section between Santry and Swords is a wide single carriageway road with dedicated bus priority lanes and segregated cycle lanes.

R108

R108 is a regional road connecting Drogheda in County Louth to Christchurch Place, Dublin. The road is 48 kilometres (30 miles) long. It serves as a connection link road to the airport between M50 and R132.

Old Airport Road

Old Airport Road stretches from Harristown Road junction with R108, to its junction with R132 – Swords Road running in parallel with the South Apron.

M1 Motorway

The M1 motorway forms the large majority of the N1 national primary road connecting Dublin towards Belfast along the east of Ireland. The route heads north via Swords, Drogheda and Dundalk to the Northern Irish border

just south of Newry in County Armagh, where it joins the A1 road and further on, the M1 motorway in Northern Ireland. It also forms a significant part of the road connection between Dublin and the Northern Irish cities of Newry, and Lisburn. The route is part of European route E01 and is 87 km (54 miles) long.

M50 Motorway

The M50 motorway is a C-shaped orbital motorway in Dublin and the busiest motorway in Ireland. The current route was built in various sections over the course of 27 years, from 1983 to 2010. It begins at Dublin Port, running northward through the Dublin Port Tunnel and along a portion of the Airport Motorway. It then turns west at its junction with the M1, circling the northern, western and southern suburbs of Dublin, before merging with the M11 at Shankill in South-East Dublin. The road forms part of European route E01 and is 45,5 km (28.3 mi) long.

10.3. Relevant Transport Proposals

10.3.1. Metro Link

In February 2018, the Government reaffirmed plans to build a Metro Link between the City Centre and Swords, through the announcement of the National Development Plan and the National Planning Framework. The proposed scheme will be 17km in length with 14 new stops and will incorporate an additional 13 km of upgraded route along the existing Luas green line from Charlemont to Sandyford. The indicative route is shown in Figure 10-2 below.

Figure 10-2 - Proposed Metrolink Route

10.3.2. BusConnects

BusConnects combines the core bus and BRT network outlined in the GDA Strategy into a plan to fundamentally transform Dublin's bus system so that journeys by bus will be fast, reliable, punctual, convenient and affordable. It will allow the bus to become a viable and attractive transport choice to more people than ever before. The two main components of the BusConnects programme are the core bus corridor upgrades and the Dublin area revised network.

The revised network 2020 big picture map is shown, in the context of the project location, in Figure 10-3 below. A more detailed local area map is shown in Figure 10-4 below.

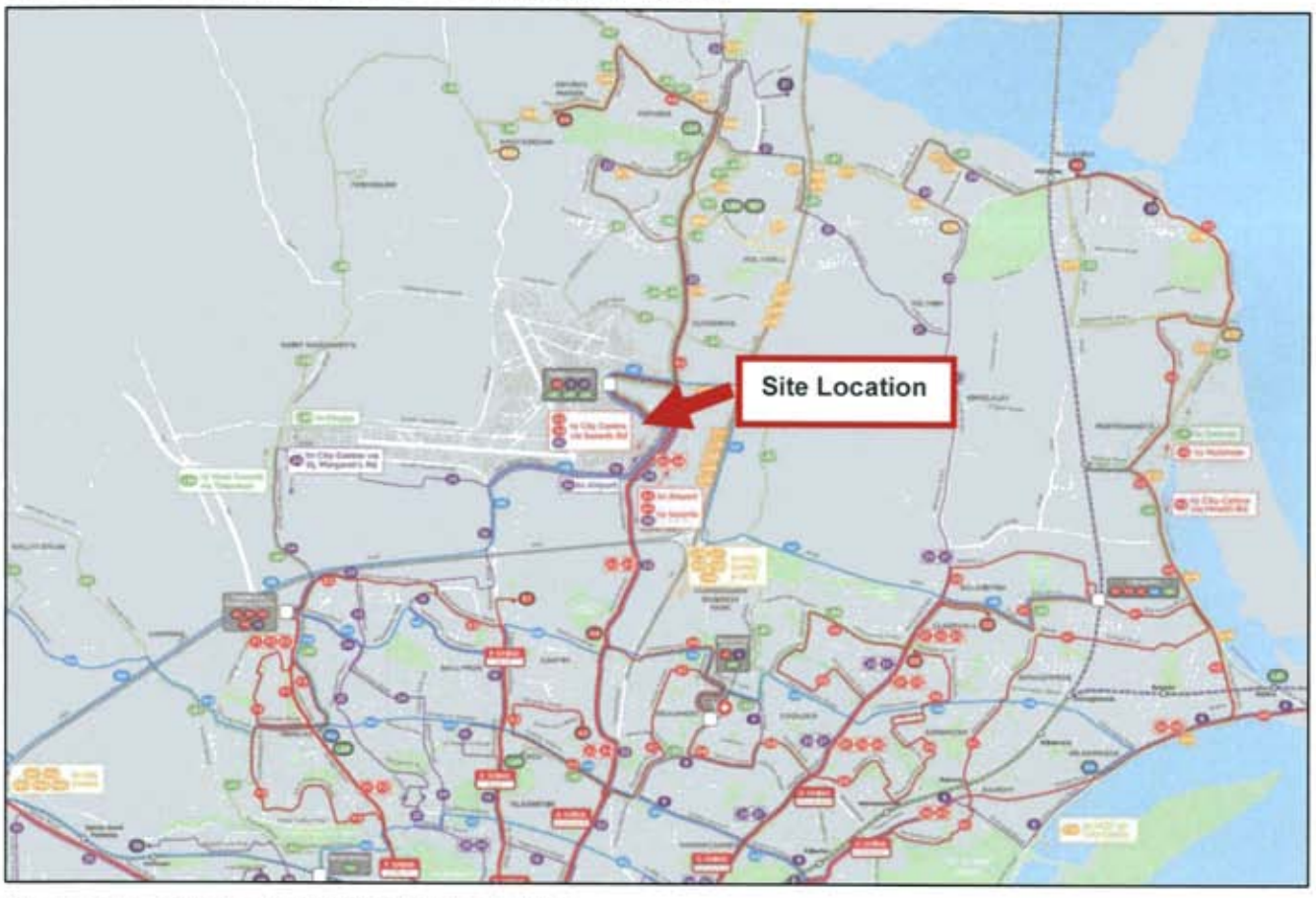


Figure 10-3 - BusConnects Overall Route Map

Figure 10-4 : Swords Local Area Map

10.3.3. Cycle Network

In 2013, the NTA published the Greater Dublin Area Cycle Network Plan, consisting of the Urban Network, Inter-Urban Network and Green Route Network for each of the seven Local Authority areas comprising the Greater Dublin Area (GDA).

The Cycle Network Plan identified and determined in a consistent, clear and logical manner, the following cycle networks within the GDA:

- The Urban Cycle Network at the Primary, Secondary and Feeder level;
- The Inter-Urban Cycle Network, linking the relevant sections of the Urban Network and including the elements of the National Cycle Network within the GDA. The Inter-Urban Network also includes linkages to key transport locations outside of urban areas such as airports and ports; and
- The Green Route Network that are cycle routes developed predominately for tourist, recreational and leisure purposes.

Unlike other area-based plans prepared previously by Local Authorities, the Cycle Network Plan is consistent across county boundaries in the GDA, such that there is continuity of route networks across these administrative boundaries.

The Cycle Network Plan for each Local Authority area is intended to be developed in accordance with the process set out in the National Cycle Manual, and also in accordance with best industry practice.

The route of most significance to the Airport is Primary Route 2A located on the R132. A section of this route between the Airport Roundabout and the R132 Old Airport Road junction has already been delivered as part of upgrade works in vicinity of the Airport. Future upgrades along the R132 will likely incorporate high quality cycle facilities with connection to Swords and towards the City Centre. A feeder route loop is also included as part of the scheme within the airport complex to provide additional connectivity. The GDA cycle routes relevant to the airport are shown in Figure 10-5 below.

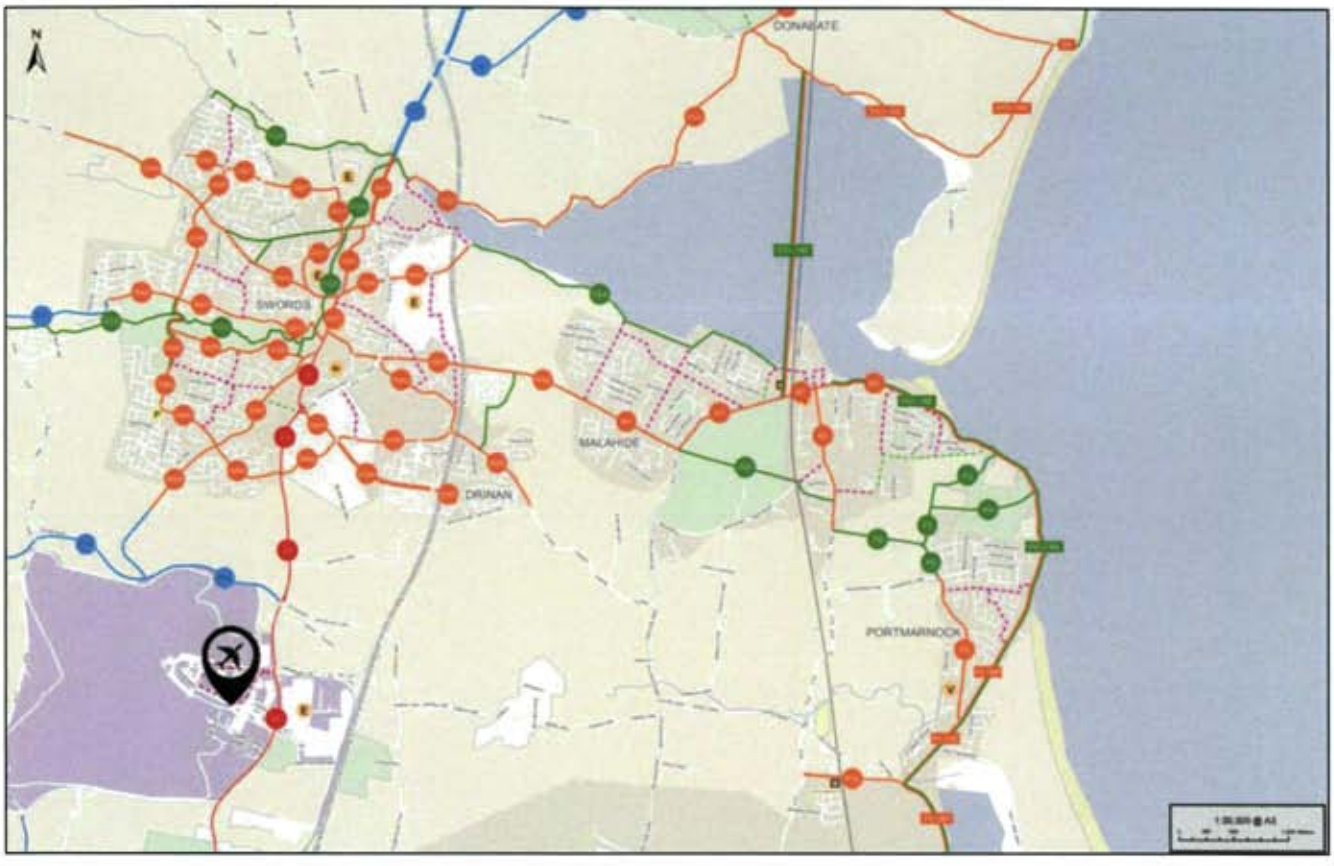


Figure 10-5 - Proposed GDA Cycle Network

10.4. Proposed Development

10.4.1. Overview

The proposed development include US Customs and Border Protection (CBP) - Proposed Reconfiguration & Expansion, and South Apron Support Centre (SASC) - Partial Demolition, Refurbishment & Upgrade Project. The layout and associated redline boundaries for each of the proposed developments are shown in Figure 10-6 and Figure 10-7.

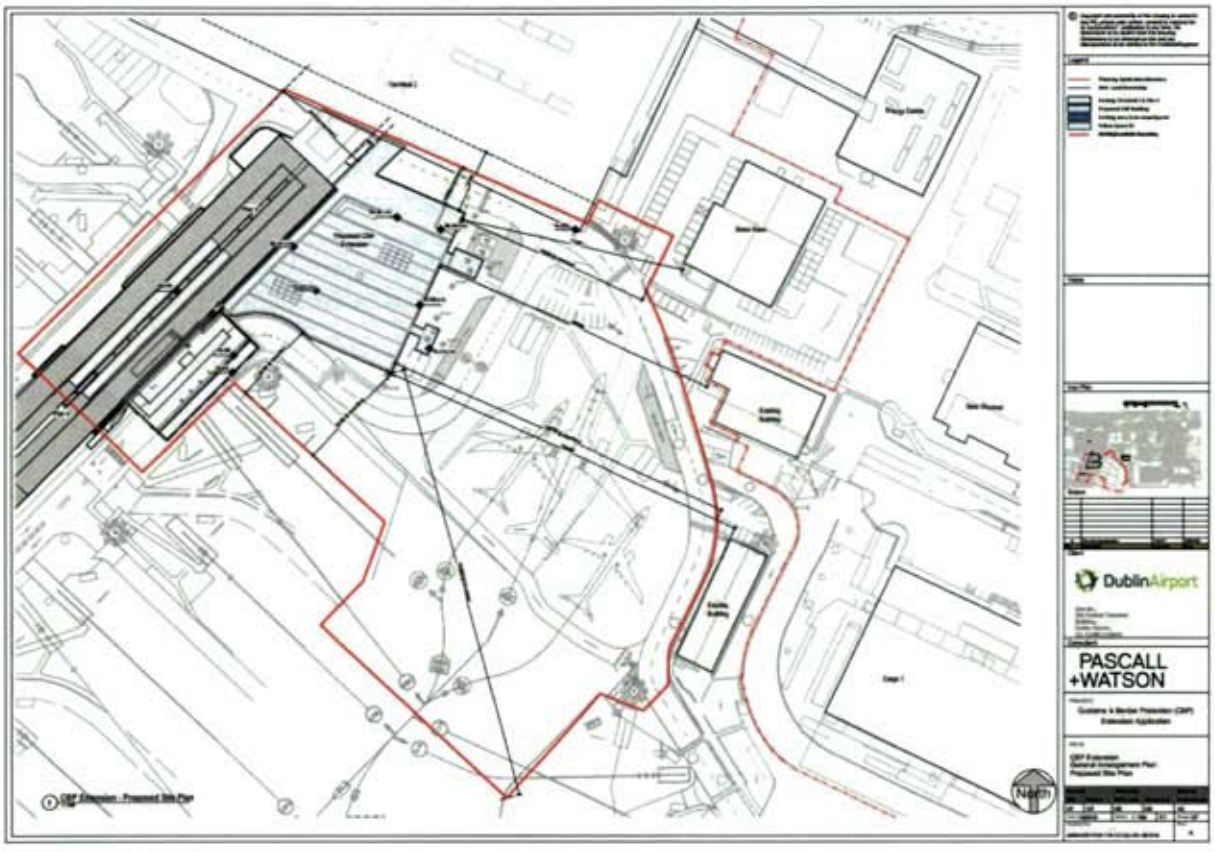


Figure 10-6 : Proposed Site Layout Plan for the US Customs and Border Protection

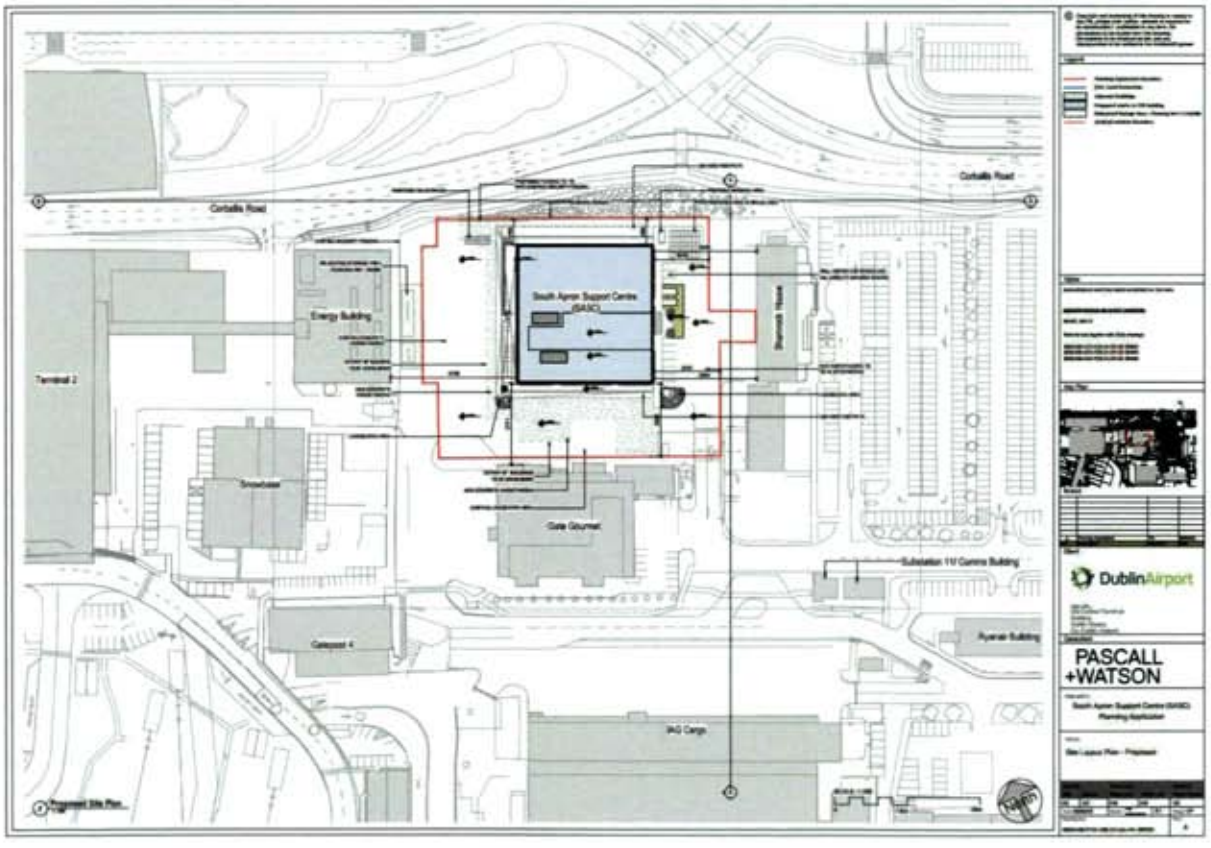


Figure 10-7 : Proposed Site Layout Plan for the South Apron Support Centre

10.4.2. South Apron Support Centre (SASC)

The proposed development is located adjacent to Gatepost 4 which will be one of two primary delivery routes for airside deliveries to the CBP alongside Gatepost 9. The two-storey former Flight Catering Building (FCB) will be partially demolished and refurbished to provide temporary landside facilities for the expansion of the CBP. The building will revert to a commercial rental on completion of the airport construction works.

The scope of works will comprise of the demolition of the South and West Flank of the building and refurbishment of the remaining structure to provide office storage and consolidated logistics/pre-screening compound for ongoing construction work on the south of the Airport. In addition, the existing link bridge to Shamrock House (Aer Lingus Building to the East) will also be demolished – Shamrock House will remain, with the façade made good following demolition of the link bridge.

The building is being refurbished and re-purposed into office and welfare facilities for ancillary airport operations. However, in the short term, it is intended to utilise the facility as a Main Contractor Compound and Construction Management Centre for the duration of the CBP construction.

Once the building is stripped back to the original block, the proposed refurbishment works will be completed in accordance with the intent of the Design report.

10.4.3. Customs and Border Preclearance (CBP)

The existing US Customs and Border Preclearance facility is located at Pier 4 adjacent to Terminal 2 in Dublin Airport and is becoming congested. Thus, it requires expansion in order to accommodate the use of the CBP facility by current passenger numbers. The project scope requires the construction of the new extension to the CBP to be constructed while always maintaining current operations. To achieve this, the works will be undertaken in phases to demolish, construct, fit out, test and commission the new extension prior to refurbishing and integrating the existing CBP facility into the new scheme. This will be achieved by constructing the new extension as a standalone structure which will be fitted out, commissioned and handed over prior to decommissioning the existing facility. The existing CBP area will be refurbished and fitted out to integrate with the new facility to complete the overall expansion project.

An airside compound will be set up to securely enclose the working area around the new building envelope providing a working area, limited site storage and temporary welfare facilities. Requirement to divert the Head of Stand Road around Pier 4 will be considered and coordinated with key deliveries during the construction phase.

Construction phases will include Pre-construction Enabling Works, Service Diversions, Site Clearance and Demolition, External Works & Road Realignment, Mobilisation and Airside Compound Set Up, CBP Envelope Construction, External Works, Internal Fit out and integration of Existing CBP, and Testing & Commissioning.

10.4.4. Corballis Road South

There is an existing segregated cycle lane along the entire Corballis Road South, providing a direct links to both Terminal 1 and Terminal 2 buildings from R132 road. It should be noted that the construction of the proposed development would not impede the existing cycle route along Corballis Road South in the future.

10.5. Potential Effects during Construction

10.5.1. Overview

The proposed development is important to the future airside operations at Dublin Airport to accommodate existing capacity and improve passenger experience. It is not expected that proposed development will change the existing operation since there is no increase in passenger numbers in the context of this application.

In this regard, it should be noted that the core function of the national road network, in particular the M1 and M50, is to facilitate transport access to key international gateways such as Dublin Airport.

The proposed development does not propose to provide new or additional staff car parking to Dublin Airport. Instead, it is proposed to utilise existing staff car parking facilities to cater for the operational staff car parking requirements.

There are landside "visitor" parking spaces proposed at the SASC. These will offset the existing loss of parking due to the proposed development. As a result, no additional bays are expected.

Nevertheless, it is considered prudent to undertake an assessment where trips associated with construction activities are considered additional to clearly demonstrate that any potential effects arising out of such a scenario would be negligible given there will be no increase in trips due to:

(i) no change in operations;

(ii) no increase in staff numbers; and

(iii) no uplift in passenger numbers.

The following sensitivity assessment outlines this scenario.

10.5.2. Construction Traffic Generation

In order to determine the traffic effects associated with the construction stage of the proposed development, the following information, assumptions and methodology in accordance with best practice and guidelines.

10.5.2.1. Staff Traffic

According to the Construction Traffic Management Plan (CTMP) staff traffic volumes are summarised below:

- Based on experience with similar projects, it is assumed that 20% of site operatives will utilise public transport. Therefore, remaining 80% will use private vehicles. Based on that, approximately 96 site operatives will use private vehicles.
- An average occupancy level of 2.5 operatives per vehicle is assumed.
- It is assumed that the expected peak level of site operatives will be as shown in Table 10-1 below:

Table 10-1 - Expected Peak Construction Traffic

Source	Trips (per Month)	Trips (per Day)
HGV (Imported / exported material)	240	12
HGV (Miscellaneous deliveries)	120	6
Personnel	3840	192
TOTAL	4200	210

10.5.2.2. Imported/exported material deliveries

- The primary construction activities (i.e., excavations, demolitions and construction) will take place over ca. 12 months for SASC and ca. 25 months for the CBP during which the majority of HGV movements will occur;
- The largest number of HGV movements will occur during the demolition and excavation works stages;
- The enabling and excavation works stage is estimated to take place over a period of 3 months.
- The anticipated volume of material to be moved (imported and exported) during the enabling and excavation works is ca. 5000m^3 which is made up of the following:
  - Exported Material: ca. 2500m^3
  - Imported Material: ca. 2500 m^3
- A bulking factor of 10% has been applied to the above material volumes;
- Working hours on the Dublin Airport campus will take place 24/7. Work will be carried out on day shifts as far as possible however a considerable part of the works is expected to be undertaken during night shifts to minimise disruption to airport operations. Sunday, Public holidays and night shift working are subject to acceptance in advance by the daa Project Owner. A Noise Management plan will be required for all night works including plant details and scheduling of works. Contractors shall also abide by the Organisation of Working Act Time in relation to working hours.
- It is assumed that there will be 20 working days in each month. As such, the total material required to be moved each day over a period of 3 months will be ca. 83.33 m^3;
- It is assumed that a Rigid HGV carries up to 20 tonnes in terms of payload and an articulated vehicle can carry up to 30 tonnes payload. However, for the purpose of a robust assessment the lower 20 tonne payload has been used in this assessment. A combination of both is envisaged to be utilised by the contactor. Considering a typical soil bulk density of 1.3 this would equate to ca. 15m^3 per load. As such this would equate to 5.53 loads per day. Assuming these are spread out during the Saturday operational hours as a worst case, this would equate to 1 load per hour.

10.5.2.3. Miscellaneous material deliveries

It is assumed that number of trips related with miscellaneous materials deliveries is 6 trips per day.

10.5.2.4. Assessment

In order to provide a robust assessment, a worst-case scenario was considered where it is assumed that the peak level of site operatives will be 50% of all trips during the day. The likely level of arrivals and departures during the AM and PM Peak is presented in PCU (Passenger Car Unit), where the HGV factor corresponds to 2:

- AM – 105 PCU (96 staff arrivals and 4.5 HGV arrivals & 4.5 HGV departures),
- PM – 105 PCU (96 staff arrivals and 4.5 HGV arrivals & 4.5 HGV departures).

It is assumed that all the staff traffic and Deliveries trips will be arriving and diverting via R132/Corballis Road/Red Car Park Access Junction, while 50% of traffic from north will be using Swords Road/Airport Roundabout and the remaining 50% will be using Old Airport Road/R132-Swords Road Junction.

Based on the above assumptions, the following table summarises the number of construction trips for the above three junctions.

Table 10-2 – Construction Traffic Trip Distribution: Arrival/Departure (for both AM and PM peak)

Junction	Staff Trips (in PCU)	Deliveries Trips (in PCU)	Total Trips (in PCU)
AM Peak			
R132/Corballis Road/Red Car Park Access Junction	96	9	105
Swords Road/Airport Roundabout	48	4.5	52.5
Old Airport Road/R132-Swords Road Junction	48	4.5	52.5
PM Peak			
R132/Corballis Road/Red Car Park Access Junction	96	9	105
Swords Road/Airport Roundabout	48	4.5	52.5
Old Airport Road/R132-Swords Road Junction	48	4.5	52.5

The following table shows the percentage increase in traffic volume at each junction as a result of trips generated due to construction. The base year volumes are based on traffic counts which were conducted in 2019. Although these counts would typically be considered old, they are deemed appropriate for this assessment as the baseline traffic volumes are from before Covid-19. In 2019 Dublin Airport operated at 32million passengers and therefore the 2019 traffic data is a worst case scenario.

These volumes were used to calculate future base flows using industry standard trip growth rates provided by the National Transport Authority (NTA).

Table 10-3 – Percentage Traffic Effect for Junctions due to construction trips

Junction	2019 Base Year Traffic	2023 Opening Year Traffic	Construction trips	Percentage Traffic Impact
AM Peak				
R132/Corballis Road/Red Car Park Access Junction	2743	2891	105	3.63%
Swords Road/Airport Roundabout	5654	6015	52.2	0.86%
R132 (Swords Road)/Old Airport Road Junction	2462	2609	52.2	2.%

PM Peak

R132/Corballis Road/Red Car Park Access Junction	2939	3003	105	3.49%
Swords Road/Airport Roundabout	5729	6087	52.5	0.86%
R132 (Swords Road)/Old Airport Road Junction	2543	2707	52.5	1.93%

The assessment was completed in accordance with the Traffic and Transport Assessment Guidelines (2014) which determine whether a traffic assessment is required. The purpose of this threshold to ensure that additional costs and delays to the developer are avoided and facilitate best practice evaluation by planning authorities, the NRA and other transport agencies.

From the above table, the percentage increase for all the junctions have been found to be well below the TII Guideline threshold of 5% for both AM and PM peak. A maximum percentage increase of 3.63% for AM peak and 3.49% for PM Peak has been observed for R132/Corballis Road/Red Car Park Access Junction.

Hence, in accordance with the thresholds set out in TII's Traffic and Transport Guidelines, no detailed junction modelling was required and it is considered that the traffic effects due to the proposed construction activity of proposed development are therefore insignificant.

10.6. Traffic Management Measures

This section of the report deals with the effects of construction of the proposed development. As with any construction project, the contractor will be required to prepare a comprehensive traffic management plan for the construction phase. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period.

This section will provide an overview of the likely routing of construction vehicles, based on a most likely scenario of construction. It should be noted that the effects of the construction will be temporary, and it will be the contractor's responsibility to prepare a Construction Traffic Management Plan (CTMP) for approval in advance of any works.

10.6.1. Policy Guidance

Guidance provided below will be adhered to, where required, for the temporary control of traffic at road works, to facilitate the safety of the public during the works:

- Traffic Signs Manual Chapter 8, Temporary Traffic Measures and Signs for Roadworks (2019);
- Addendum Transport Chapter 8, Temporary Measures and Sign Roadworks (2019), and
- Traffic Management Guidelines, Department of Transport (2019).

10.6.2. Programme of Works

In terms of construction programme, it is anticipated that it will extend over a duration of ca. 25 months.

10.6.3. Access Arrangements

In terms of access, construction vehicles will gain entry and exit for deliveries etc. via Corballis Road South/Corballis Park, to the west of the site through gates positioned adjacent to the landside access road to Security Gatepost 9 for aggregates and concrete, and Gatepost 4 for other building materials such as steel, cladding, glazing and roofing. It is intended at this stage that all construction vehicles will be accommodated within the subject site, to be confirmed with daa and the ultimate Contractor at detailed CTMP stage. The contractor will be responsible for identifying an appropriately located site office and compound.

10.6.4. Construction Routes

It is recommended that construction traffic access be facilitated using the following routes:

- via Old Airport Road/R132-Swords Road Junction and Corballis Road South, or
- via Airport Roundabout, R132-Swords Road and Corballis Road South.

Both routes are shown Figure 10-8 below.

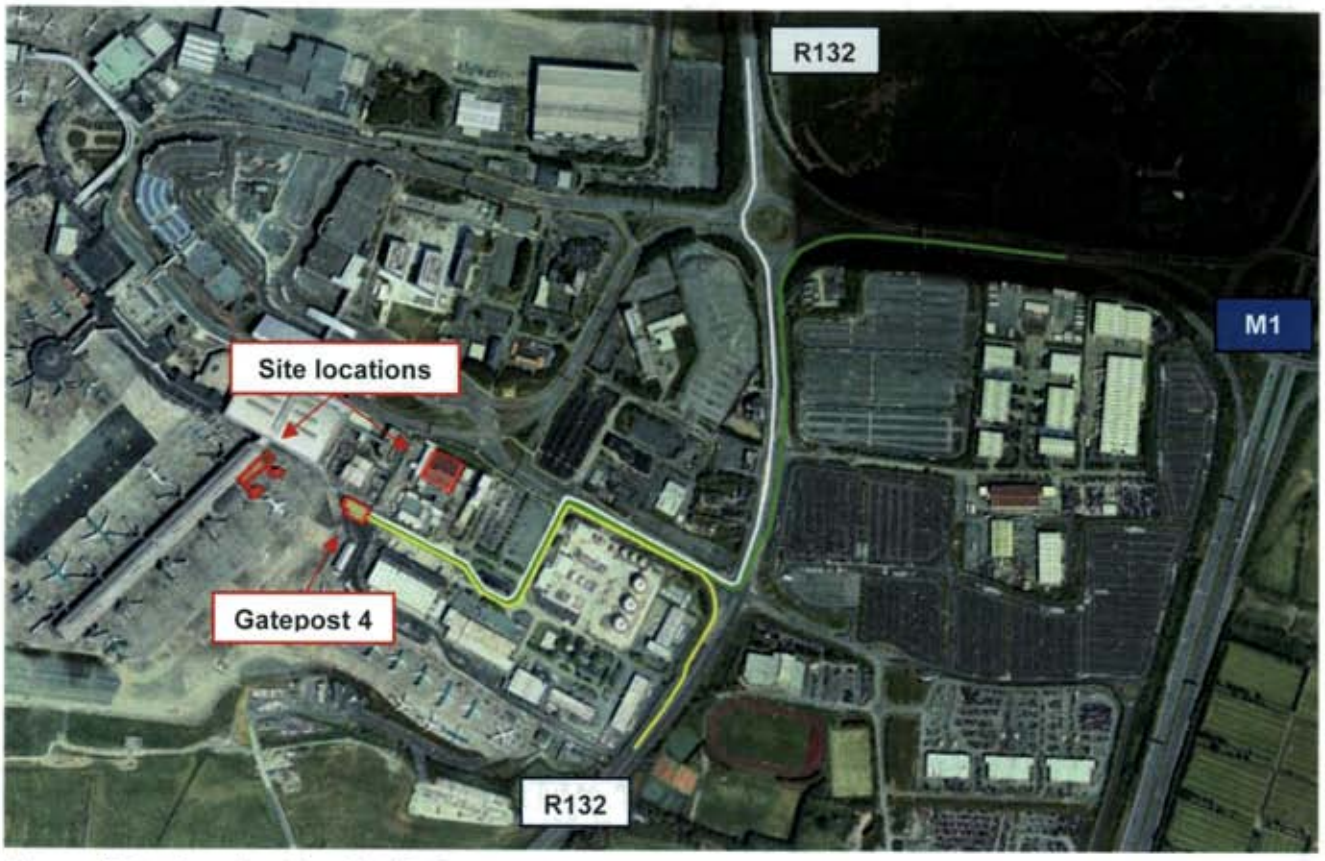


Figure 10-8 - Construction Traffic Routes

This will ensure that construction vehicles travel the most direct route to access the site, and vice versa vehicles will exit the site using the same junction.

10.6.5. Environmental Control Measures

There is the potential that construction debris, particularly from site clearance, soil removal and dirty water run off may have an effect on footpaths and roads adjoining a construction site. In order to mitigate against this risk, the contractor is to monitor footpaths and road pavement surfaces throughout the project duration.

Further to this a Construction Environmental Management Plan (CEMP) will be developed by the contractor, which will include strict control measures in relation to Foreign Object Debris (FOD) at all times while works are being carried out within the Airport, prior to the commencement of the work on the proposed development site.

10.6.6. Hours of Operation

Working hours on the Dublin Airport campus will take place 24/7. Work will be carried out on day shifts as far as possible however a considerable part of the works is expected to be undertaken during night shifts to minimise disruption to airport operations. Sunday, Public holidays and night shift working are subject to acceptance in advance by the daa Project Owner. A Noise Management plan will be required for all night works including plant details and scheduling of works. Contractors shall also abide by the Organisation of Working Act Time in relation to working hours.

10.7. Potential Effects during Operational Phase

10.7.1. Operational Traffic Generation SASC

The SASC building, which is currently not being used, will attract staff and user trips once it is refurbished and put into temporary use as compound site for new CBP construction. However, this represents an internal redistribution of already existing trips to and from the airport. Although it is noted that visitor parking bays are anticipated to be included, they are not considered to be additional parking due to offsets with existing provision.

Therefore, the conclusion is that the proposed development will not have any operational traffic effect.

10.7.2. Operation Traffic Generation CBP

The US Customs Border Preclearance (CBP) facility will optimise passenger experience without capacity increase. Employee increases are expected to be minimal to support existing staff, as the purpose of the development is to cater for the current passenger demand.

Therefore, the conclusion is that the proposed developments will not have any operational traffic effect.

10.8. Cumulative Effects

The proposed development will occur in a phased manner over at least 2.5 years. The most intense construction traffic phases were identified and analysed for assumed peak trips on key junctions. In accordance with the thresholds set out in TII's Traffic and Transport Guidelines, no junctions were required to be brought forward for detailed assessment and it is considered that the cumulative construction traffic effects due to the construction activity for the proposed development and other projects is below the thresholds outlined in the TII guidelines.

10.9. Mitigation Measures

Maintaining the safety of the general public is a priority. With a series of robust controls, proactive measures and development of a detailed Traffic Management Plan, the risk of this key interface can be mitigated.

The following measures will be adopted around the perimeter of the project for security and protection purposes:

- All site access will be well lit, clean, robust level hard-standings, well signed and controlled by experienced gatemen. Doors and gates will be closed at all times when not providing access.
- The traffic management team will be clean and well presented at all times.

The contractors detailed Traffic Management Plan will address the following key issues:

- Maintaining free traffic flow along the local road networks.
- Ensuring all footpaths and road surfaces are always free from debris.
- Ensuring the efficient free flow of operatives entering and exiting the proposed development site.
- Managing the distribution flow of materials within the building and debris removal to maintain the required levels of productivity whilst achieving the high-quality standards expected.
- Plant and operative segregation during all stages of the proposed development.
- Robust traffic management principles and practices will need to be enforced to ensure construction traffic does not create congestion and cause inconvenience to the adjacent tenants and the public.
- Accommodating the welfare of circa 120 construction personnel at the peak of construction activity.
- Protection to the public for the duration of the project construction phase on all elevations.

All deliveries will be through Corballis Park to Security Gatepost 9 for aggregates and concrete, and Gatepost 4 for other building materials such as steel, cladding, glazing and roofing.

The contractor will develop a detailed Logistics Plan to identify the delivery schedule requirements for every delivery. Where necessary the deliveries will be held in a pre-screening area in the SASC compound prior to accessing the site through the Gatepost 9, and Gatepost 4.

It is anticipated that the contractor will operate a "Just in Time" delivery philosophy to minimise materials stored on site and reduce congestion in and around the works compound.

10.10. Residual Effects

There are no residual effects recognized to be emanating from the proposed development.

10.11. Do Nothing Scenario

The 'Do Nothing' scenario is anticipated to be representative of the 'Do Something' scenario from a traffic perspective. This is attributed to the proposed function of the proposed development which seeks to accommodate existing capacity and improve passenger experience. It is not expected that proposed development will change the existing operation since there is no increase in passenger or staffing numbers.

The potential for significant impacts emanating from this scenario are improbable.

10.12. Conclusion

This chapter seeks to provide a description of the outline methodology and anticipated traffic impact of the proposed development.

The Site Location is within the airport lands at Dublin Airport on the eastern side of the complex and is situated to the southern side of Corballis Road in close proximity to the R132, M1 and M50.

The Proposed Development includes partial demolition and refurbishment of the South Apron Support Centre (SASC) to provide landside facilities for the expansion of the US Customs Border Preclearance (CBP) facility.

Strategically, the proposed development is of critical importance to airside operations at Dublin Airport. In this regard it should be noted that the core function of the national road network, in particular the M1 and the M50, and its supporting road links, is to facilitate transport access to key international gateways such as Dublin Airport.

From an Operational Traffic point of view, the proposed development is anticipated to replace existing services and, therefore, provide no increase in overall traffic. As a result, no further assessment was required.

From a Construction Traffic point of view, a worst-case scenario was considered in order to provide a robust assessment. It was assumed that the peak level of site operatives will coincide with the peak level of HGV movements. The likely level of arrivals and departures during the AM and PM Peak are presented in PCU (Passenger Car Unit), where the LGV factor corresponds to 1 and the HGV factor corresponds to 2:

- AM – 105 PCU (96 staff arrivals and 4.5 HGV arrivals & 4.5 HGV departures),
- PM – 105 PCU (96 staff departures and 4.5 HGV arrivals & 4.5 HGV departures).

It is assumed that all the staff traffic and Deliveries trips will be arriving and diverting via R132/Corballis Road/Red Car Park Access Junction, while 50% of traffic from north will be using Swords Road/Airport Roundabout and the remaining 50% will be using Old Airport Road/R132-Swords Road Junction. These volumes were then compared with existing trip volumes at surrounding junctions in order to determine whether further assessment of junction modelling was required. It was found that the percentage increase for all the junctions were well below the threshold of 5% for both AM and PM peak. A maximum percentage increase of 3.63% for AM peak and 3.49% for PM Peak has been observed found for R132/Corballis Road/Red Car Park Access Junction.

Hence, in accordance with the thresholds set out in TII's Traffic and Transport Guidelines, no junctions were required to be brought forward for detailed assessment and it is considered that the traffic impacts due to the proposed construction activity of proposed development are below the TII Guideline thresholds.

11. Land, Soils & Geology

11.1. Introduction

This chapter describes the type of land, soils and geology likely to be encountered beneath the proposed development. It also addresses the potential effects of the proposed development on land, soils and geology together with the mitigation measures that will be employed to eliminate or reduce any potential effects. The proposed US Customs and Border Protection (CBP) - Proposed Reconfiguration & Expansion & South Apron Support Centre (SASC) - Partial Demolition, Refurbishment & Upgrade Project located in Dublin Airport (i.e. the red line boundary) is here after referred to as 'the proposed development' or 'the site'. The site is located within Fingal County Council (FCC) and entirely on land owned by daa, within the boundary of Dublin Airport. The general land use within the site boundary is hardstanding (both airside and landside). A detailed description of the proposed development is presented in Chapter 2 - Project Description.

11.2. Study Assessment and Methodology

The following scope of works was undertaken by Atkins in order to complete the land, soils and geology assessment presented in this chapter;

- Desk-based study including review of available historical and relevant ground investigation information; and,
- Site Walkover Survey by an experienced Geo-environmental Consultant.

This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*' (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, '*Geology in Environmental Impact Statements, A Guide*' (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments. This assessment has also been prepared in accordance with the relevant Environmental Protection Agency (EPA) guidance, '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' published in May 2022.

The desk-based study involved reviewing information from the following sources: -

- GSI Datasets Public Viewer and Groundwater web-mapping (consulted 13/02/2023);
- Ordnance Survey web-mapping to assess the surface topography and landforms (consulted 13/02/2023);
- EPA Public Viewer and web-mapping (consulted 13/02/2023);
- Google Maps Aerial photography (consulted 13/02/2023);
- Bing Maps Aerial photography (consulted 13/02/2023); and,
- Draft Ground Investigation information pack entitled '*NASAH North Apron & South Apron GI – Ground Investigation*' prepared by Causeway Geotech Ltd. (2022).

The ground investigation for the proposed development was carried out by Causeway Geotech Ltd between June to November 2022 in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007), BS 5930:2015, and BS 1377 (Parts 1 to 9). The following draft information has been reviewed:

- Trial Pit Logs (35No.);
- Cable Percussion Borehole Logs (3No.);
- Rotary Core Logs (17No.);
- Environmental Soil sampling and laboratory analysis; and,
- Survey map of Exploratory Hole Locations.

Cable percussive boreholes (BH03, BH04 and BH04A) were drilled to a maximum depth of 4.5mbgl. 17no. Rotary boreholes were drilled to a maximum depth of 10.5mbgl.

Representative environmental soil samples were collected from selected trial pits across the Site and the wider environs at Dublin Airport and were subsequently scheduled for laboratory analysis.

Further details are presented in the Draft Ground Investigation information pack entitled 'NASAH North Apron & South Apron GI – Ground Investigation' prepared by Causeway Geotech Ltd. (2022), presented in Appendix 11. No difficulties were encountered during the data collection and assessment stages of this land, soils and geology assessment.

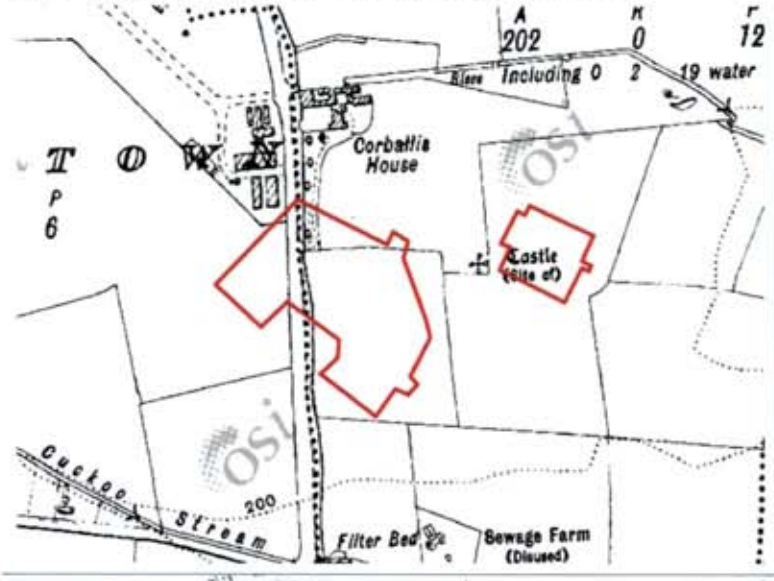
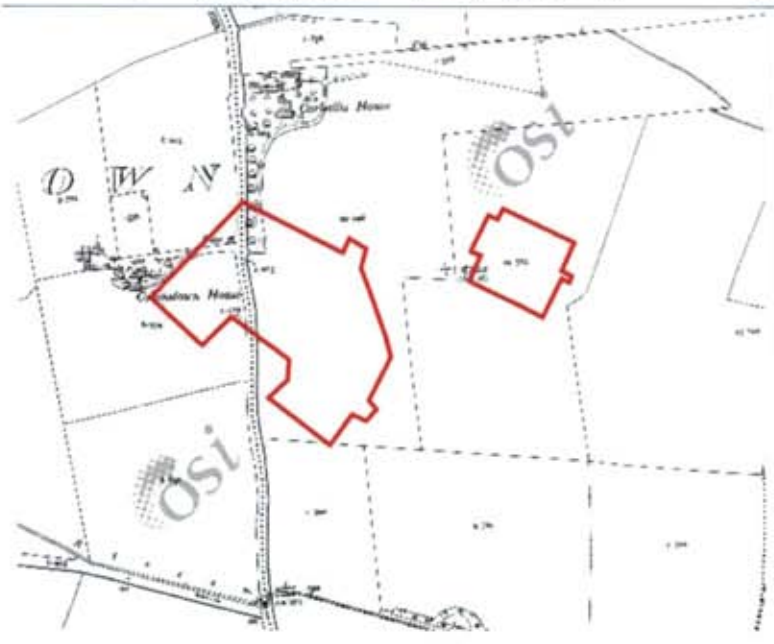
11.3. Receiving Environment

This section provides a description of the land, soils and geology in the general region of the proposed development and also takes account of the current and historic uses of the proposed development (hereafter referred to as the Site).

11.3.1. Site Development

A review of historic maps (including available 6-inch historic maps, 25-inch historic maps, and aerial photographs (1995 to 2018) from the Ordnance Survey of Ireland) (OSI, 2023) and current aerial photography (Bing Maps, 2023) confirms that land use at the Site has generally been transformed over the years from greenfield use (and the historic site of a castle) to airport infrastructure. The site has developed considerably since the late twentieth century. A summary of land use both in relation to the Site and surrounding lands is presented in Table 11-1.

Table 11-1 – Historic Land Use Development - Summary

	MapGenie 6 Inch BW 1829-1841 (OSI, 2023) The Site is dominated by greenfield use, Corballis House & access road, and is also noted to be the site of a historic castle.
	Historic Map 25 Inch 1897-1913 (OSI, 2023). There is no significant change in the surrounding area.

Aerial Map 1995 (OSI, 2023).

The 1995 aerial map shows the CBP Site to be used as an airside area while SASC Site has been developed as an industrial / commercial area. Development of the surrounding area includes airport campus lands and associated car parking. Further to the north and east of the Site, residential and commercial development has occurred.

Aerial Map 1999-2003 (OSI, 2023).

No significant changes are noted between the 1995 and the 2003 aerial photography.

Aerial Map 2004-2006 (OSI, 2023).

There is no significant change between 2004 to 2006.

Aerial Map 2005-2012 (OSI, 2023).

Pier 4, terminal 2 and CBP site at the beginning of Pier 4 has been constructed.

Aerial Map 2013-2018 (OSI, 2023).

No significant changes are noted between the 2013 and the 2018 aerial photography.

Current Aerial Map 2022 (Bing, 2023)

No significant changes are noted on the current (2023) aerial photography.

11.3.2. Current Site Setting (and Topography)

The site is generally bounded by existing airport infrastructure. The proposed development at the US Customs and Border Protection (CBP) is bound to the west and south by airside infrastructure including Pier 4 and by landside infrastructure to the north and east, including Terminal 2, and the proposed South Apron Support Centre (SASC) respectively.

The two-storey SASC, formerly known as the Flight Catering Building (FCB), is located to the southeast of the Terminal 2 Energy Centre and to the north west of Shamrock House.

The Site is currently heavily trafficked and consists of fully 'urban/made' ground, with limestone till underlying made ground beneath the site. The lands are populated by airport infrastructure. Access and egress to the Site is currently provided off Swords Road and further in to Corballis Road South. The Site is generally bounded on all sides by airport infrastructure (south and west) and general airport facilities and car parks associated with landside airport operations to the north and east. The lands on which the development is proposed is entirely within daa land ownership and is zoned by Fingal County Council development plan 2023 – 2029 (FCC 2022) as "DA" Dublin– Airport, with the zoning objective being to 'ensure the efficient and effective operation and development of the airport in accordance with an approved Local Area Plan'. The proposed development has been designed in accordance with the zoning requirements. Land use zoning objectives are consistent with the national and regional policy which seek the development of serviced sites within settlements designated for development.

The Cuckoo Stream is located immediately south of the site at the end of Pier 4. The stream is not located within the application site boundary. It is culverted and emerges downstream within the wider Airport Campus. Further details on drainage and the condition of the Cuckoo Stream can be found in Chapter 12 – Water. The general topography of the Site is ca. 60m above ordnance datum (mOD) in the central part of the Site according to

available ground investigation records (Causeway Geotech Ltd, 2022). Based on EPA ground elevation contours, the land topography in the wider area is generally 60mOD.

11.3.3. Ground Investigation

Exploratory locations completed during the Ground Investigation are presented in Figure 11-1. Refer also to Draft information presented in Appendix 11.

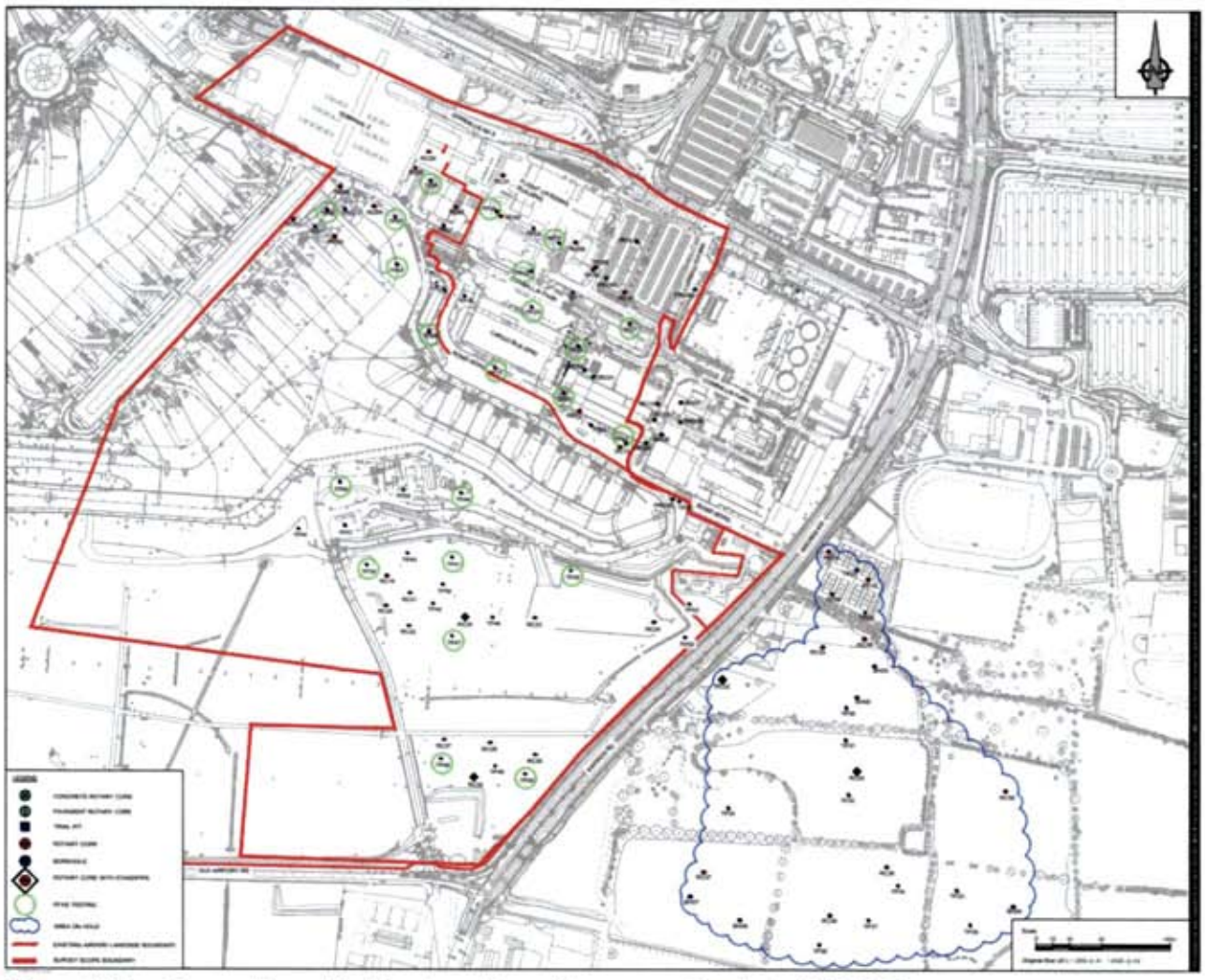


Figure 11-1 - Ground Investigation Locations (Causeway Geotech Ltd, 2022).

11.3.4. Soils

Based on the Teagasc soils database available on the GSI public data viewer, the dominant soil type underlying the Site and surrounding area is made ground. Refer to Figure 11-2.

Figure 11-2 – Teagasc Soil Maps (GSI, 2023)

According to the GSI public data viewer (GSI, 2023), the primary superficial / quaternary sediments underlying the Site comprise Till derived from limestone. It is also noted that Bedrock outcrop or subcrop is present ca. 0.3km north of the proposed Site (GSI, 2023). However bedrock outcrop or subcrop was not encountered within the proposed site during the ground investigation. Refer to Figure 11-3.

Regional soil descriptions were verified by the 2022 ground investigation. Site specific soils records, as observed during the ground investigation (Causeway Geotech Ltd, 2022) are summarised as follows;

- Topsoil was encountered at most locations across the Site and ranged from ca. 0.1 to 0.25mbgl.
- Made Ground was encountered at various locations across the Site to a maximum depth of 2.4mbgl at TP18. Made ground beneath the Site generally comprised reworked soil or gravel fill material; however rare to occasional inclusions of red bricks, concrete and plastic were identified at 8no. locations (BH03, RC31, TP07, TP12, TP41, TP44, TP54 and TP57).
- Till encountered across the Site has been described primarily as firm to very stiff, brown, sandy Clay with occasional cobbles.
- This is generally underlain by loose to very dense dark greyish sandy gravel / gravelly sand, to a maximum encountered depth of ca. 10.5mbgl.
- No bedrock was encountered in the rotary cored boreholes up to a depth of ca. 10.5m bgl.

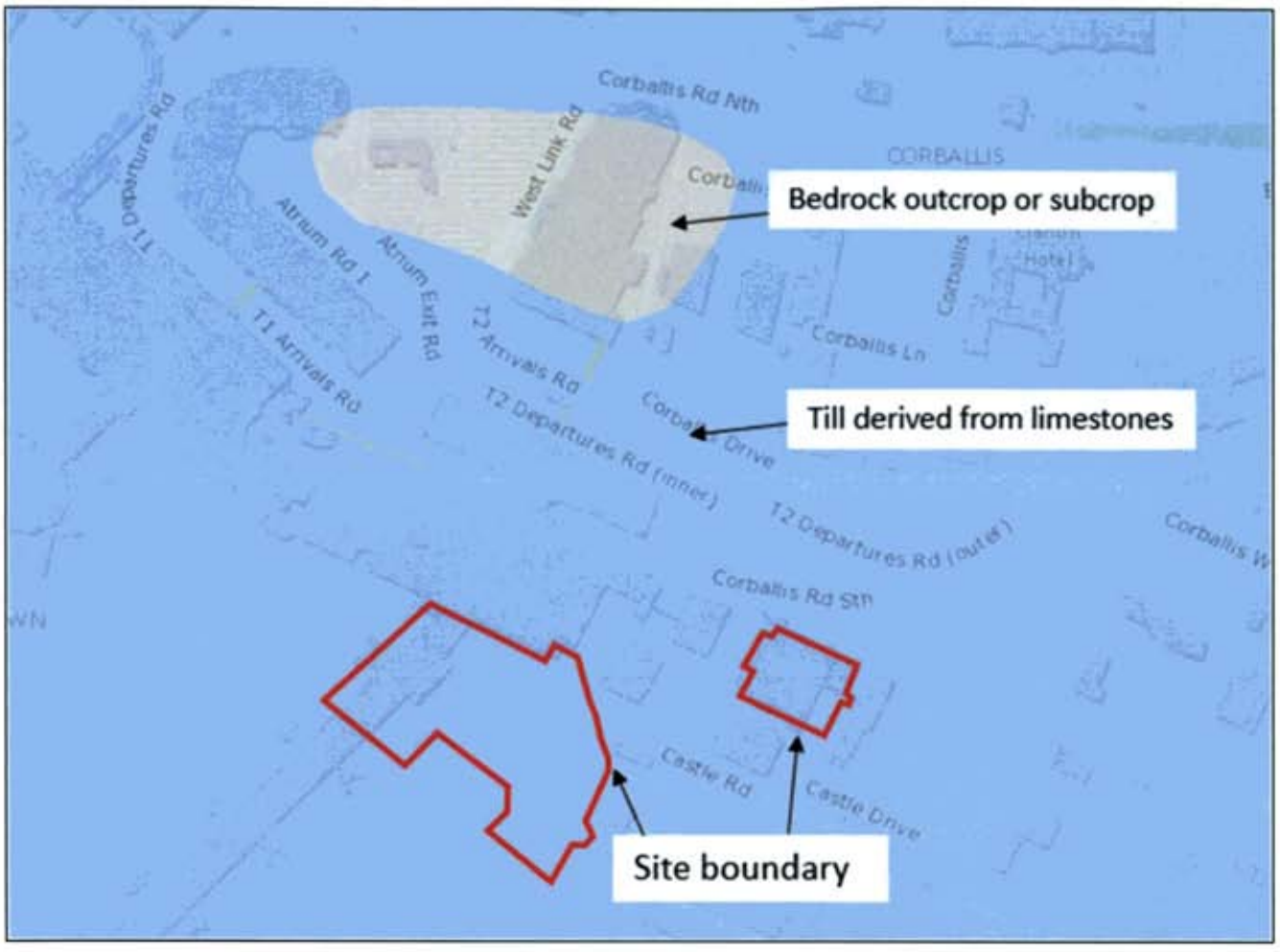


Figure 11-3 – Superficial / Quaternary Deposits (GSI, 2023)

11.3.4.1. Soil Quality / Contaminated Land

On a regional scale there are three EPA licenced facilities outside of the proposed development as follows:

- Ballymun recycling centre (site code: W0303-01), located 3.3km southwest of the proposed site;
- North city operations depot (site code: W0302-01), located 3.3km southwest of the proposed site; and
- Greenstar Ltd. (site code: W0134-01), located 4.1km west of the proposed site.

On a regional scale there are 19No. IEL, IPC & IPPC licenced facilities outside of the proposed development as follows:

- MSD International GmbH t/a MSD Ireland (Biotech Dublin) (site code: P1106-01), located 3.41km northeast of the proposed site;
- Anglo Beef Processors Ireland (Swords) (site code: P0189-01), located 1.28km northeast of the proposed site;
- Dublin Aerospace Limited (site code: P0480-02), located 0.68km north of the proposed site;
- International Aerospace Coatings Limited (site code: P0921-01), located 0.71km north of the proposed site;
- Amazon Data Services Ireland Limited (site code: P1171-01), located 2.2km southeast of the proposed site;
- Global Switch Property (Dublin) Limited (site code: P0109-01), located 2.5km southeast of the proposed site;
- Diamond Innovations Irish Operations (site code: P0532-01), located 2.45km southeast of the proposed site;
- Modus Media International Dublin (site code: P0149-01), located 2.52km southeast of the proposed site;
- Forest Laboratories Ireland Limited (site code: P0306-03), located 3.0km southeast of the proposed site;

- Crown Paints Ireland Ltd (site code: P0248-01), located 4.6km southeast of the proposed site;
- Wood-Printcraft Limited (site code: P0134-01), located 4.62km southeast of the proposed site;
- Mondelez Ireland Production Limited (Coolock) (site code: P0809-01), located 4.7km southeast of the proposed site;
- Barclay Chemicals Manufacturing Limited (site code: P0317-01), located 3.0km south of the proposed site;
- Computer Plating Specialists Limited (site code: P0278-01), located 3.3km south of the proposed site;
- Mouldpro International Limited (site code: P0131-01), located 4.3km southwest of the proposed site;
- Burgess Galvin and Company Limited (site code: P0075-03), located 4.6km southwest of the proposed site;
- W.I. Limited (site code: P0293-01), located 4.6km southwest of the proposed site;
- Amcor Flexibles (site code: P0119-02), located 5.3km southwest of the proposed site;
- (site code: P0293-01), located 4.7km southeast of the proposed site;

On a regional scale there are three Section 4 Discharges licenced facilities within the proposed site:

- Irish Kennel Club (site code: WPW/F/044), located 1.8km northeast of the proposed site;
- Roadstone Ltd (site code: WPW/F/003), located 3.5km southwest of the proposed site;
- Eastcoast Catering (site code: WPW/F/039), located 4.9km southwest of the proposed site;
- (site code: P0293-01), located 4.6km southwest of the proposed site;
- (site code: P0293-01), located 4.6km southwest of the proposed site;

Refer to Figure 11-4.

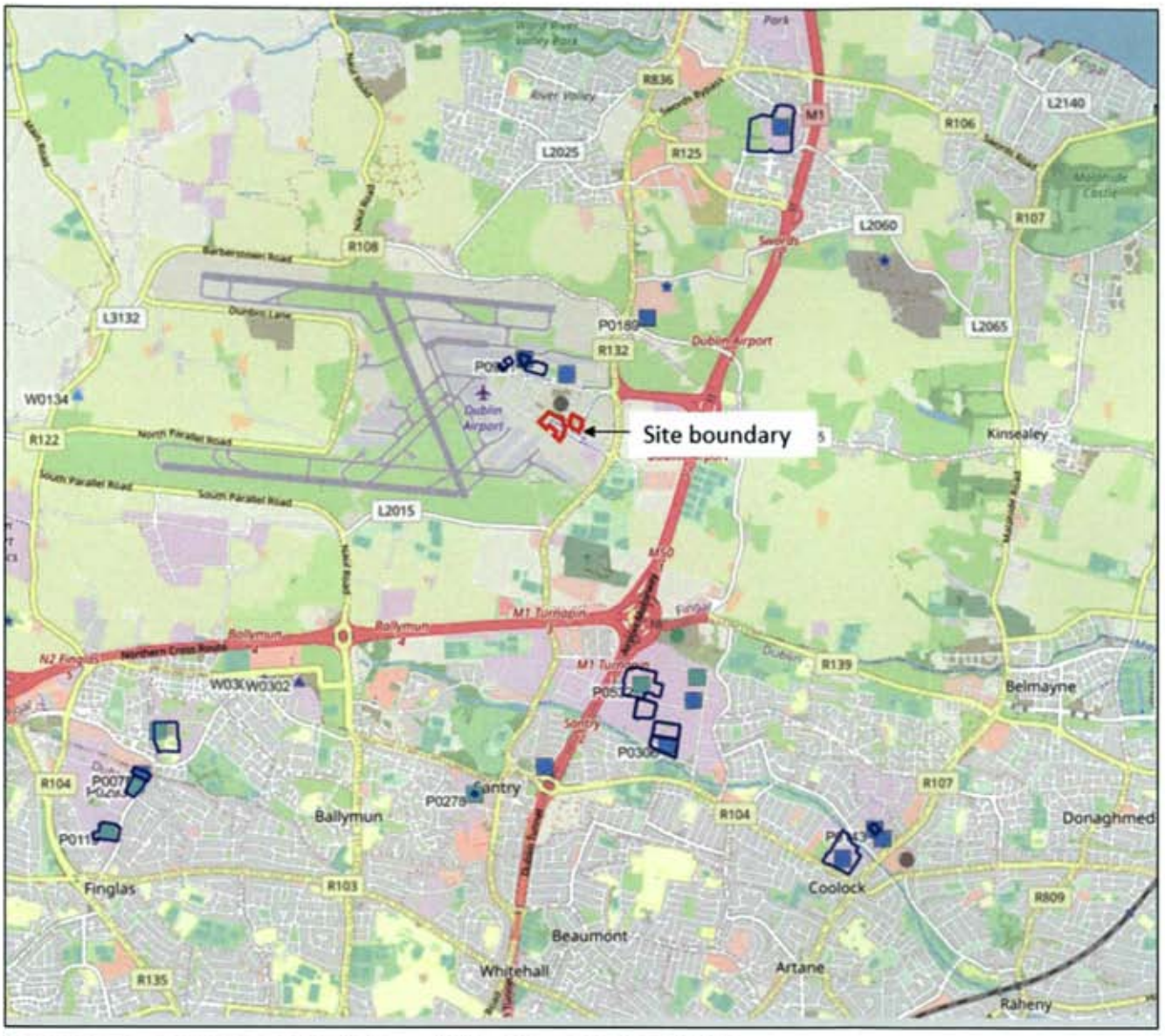


Figure 11-4 – EPA licenced facilities outside of the Site (EPA, 2023)

Selected representative environmental soil samples were collected during the ground investigation across the Airport and analysed for a comprehensive suite of analytical parameters by Eurofins Chemtest Ltd (including asbestos containing material, heavy metals, key indicator parameters, petroleum hydrocarbons, and polyaromatic hydrocarbons (PAHs)).

Based on the available soils analytical data and draft trial pit records presented in Appendix 11, no evidence of significant onsite soils contamination is noted. As previously described, occasional waste inclusions are present within the made ground in this area.

11.3.5. Bedrock Geology

The GSI bedrock geology 100k map identifies the underlying bedrock at the Site as the Tober Colleen formation and the Waulsortian Limestones are encountered to the north side of the site. The Tober Colleen formation is described as calcareous shale, limestone conglomerate and the Waulsortian Limestones are described as massive unbedded limestone as presented on Figure 11-5 below. The GSI Bedrock mapping database (GSI, 2023) shows that there is a thrust fault located ca. 0.5km north west of the Site.

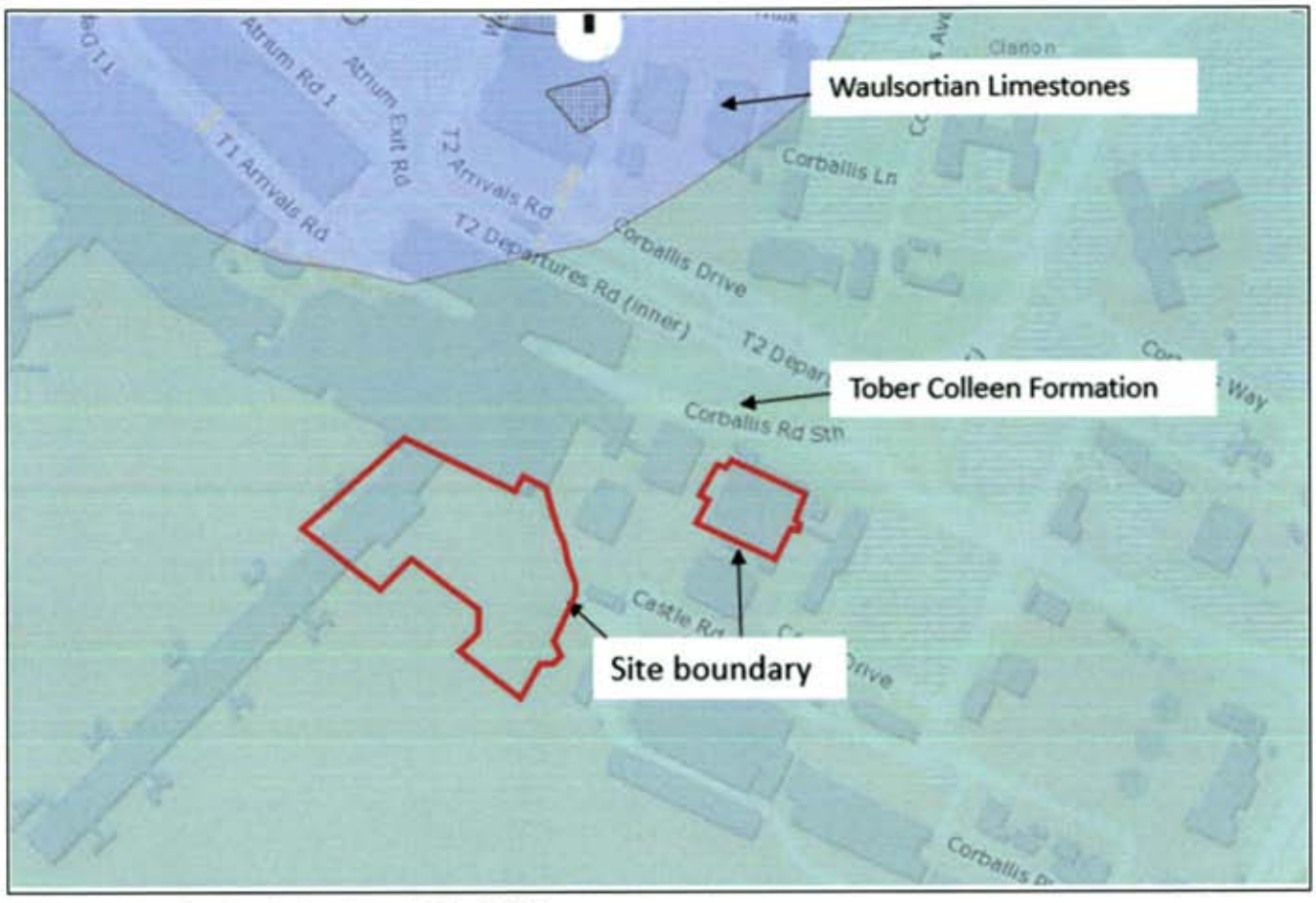


Figure 11-5 – Bedrock Geology (GSI, 2023)

There is a karst feature or a 'spring' located 4.7km east of the Site based on the GSI regional geology mapping. Karst features would not be expected to be encountered beneath the Site or surrounding lands, based on a review of available geological records for Dublin Airport.

The regional geological descriptions were verified by the results of the ground investigation. Site specific records, as observed during the ground investigation (Causeway Geotech Ltd, 2022), were relatively consistent and are summarised as follows;

- No bedrock was encountered up to a depth of 10.5m bgl from rotary cores.
- Limestone GRAVEL with low cobble content, cobbles are subangular of limestone was encountered in RC21 between 4.9 to 5.85m bgl.

11.3.6. Geological heritage

Feltrim Quarry geological heritage area (site code: DF005) is located approximately 3.3km northeast of the Site as shown in Figure 11-6. The geological heritage area is described by the GSI (2023) as a 'Working quarry on Feltrim hill.' It is described by the GSI as '*exposed faces of lower Carboniferous limestone, shale locally fossiliferous*' (GSI, 2023). The proposed development will not have any impact on the Feltrim Quarry geological heritage area, based on the distance of Feltrim Quarry from the Site.

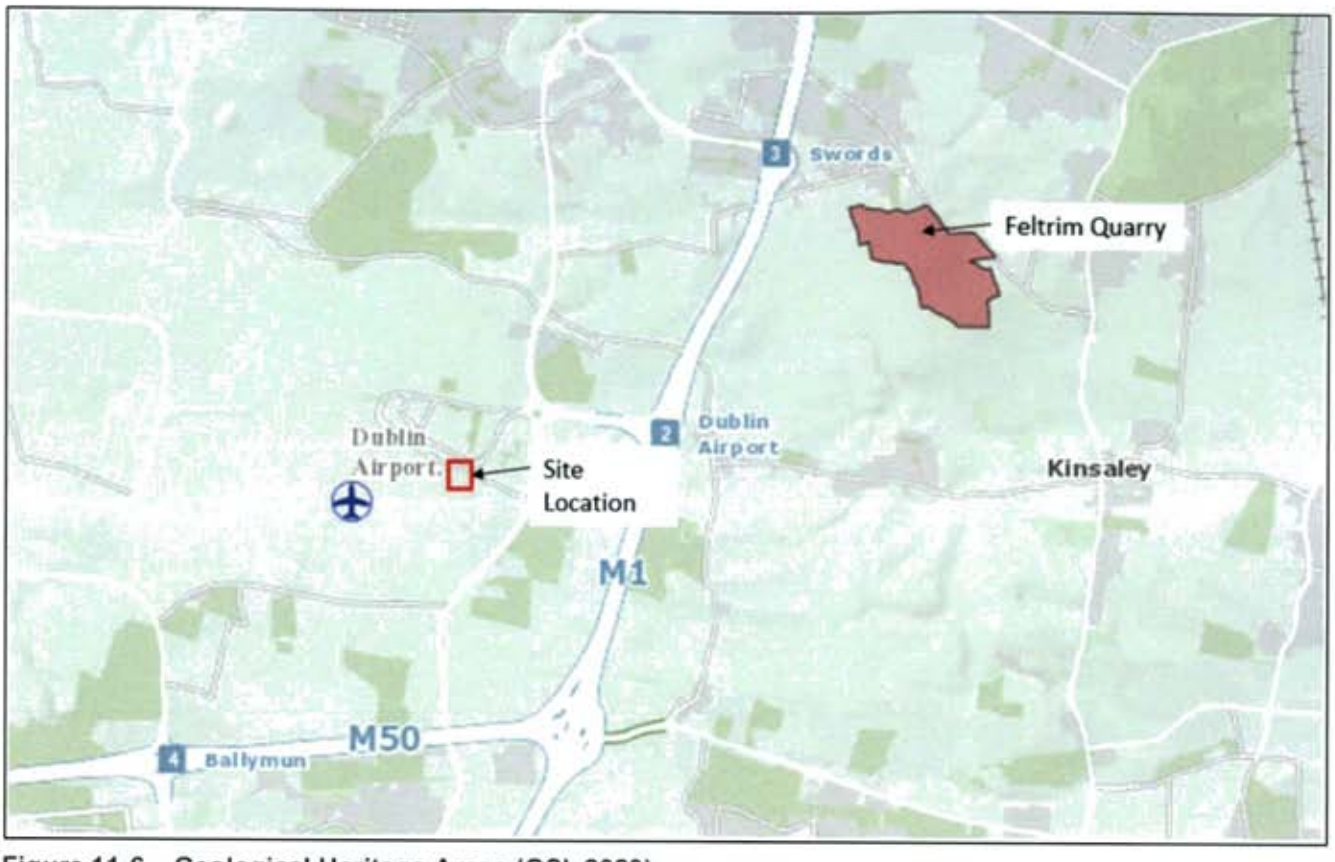


Figure 11-6 – Geological Heritage Areas (GSI, 2023)

11.3.7. Geo-hazards

No landslide susceptibility issues are reported within the Site (GSI, 2023). Landslide susceptibility is '*low*' within the Site. The closest reported landslide event is located approximately 11.6km southwest of the Site at Knockmaroon Glen Quarry Diswellstown (refer to Figure 11-7).

Figure 11-7 – Landslide Susceptibility (GSI, 2023)

11.3.8. Mineral occurrences

There is a limestone quarry located approximately 3.27km northeast of the Site.

11.3.9. Radon

Available EPA radon maps shows that less than one percent of the homes within the 10km grid square (standard approach by EPA to radon mapping) where the Site is located, have radon concentrations in excess of the national Reference Level of 200 bequerel per cubic metre (Bq/m^3) as shown in Figure 11-8 (EPA, 2023). However, in accordance with relevant building regulations, a radon barrier will be installed beneath all buildings to be constructed as part of the proposed development. Therefore, radon is not likely to have a significant effect as a result of the proposed development.

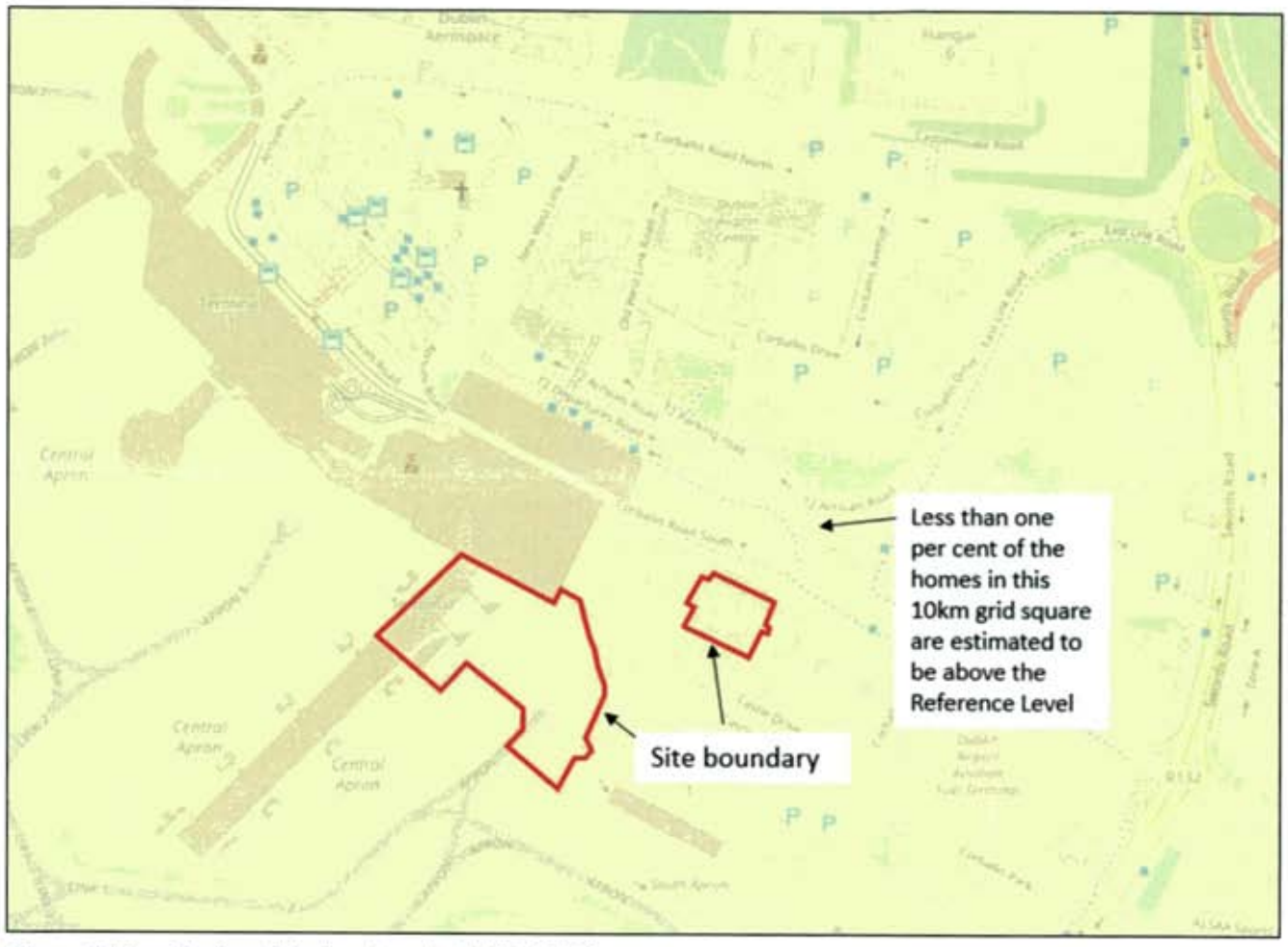


Figure 11-8 – Regional Radon Levels (EPA, 2023)

11.4. Potential Effects of the proposed development

11.4.1. Construction & Demolition Phase

11.4.1.1. Land (Including Land Take)

The proposed development is not likely to have a significant effect on land (including land take). There will be no change in overall use of the relevant Airport campus lands.

11.4.1.2. Soils and Geology

Activities during construction will primarily comprise of the partial demolition and reconfiguration of the existing facilities and construction of new facilities as described in detail in Chapter 2.

- Tracked excavators will likely be sufficient to excavate soils to a maximum depth of 4m across the Site. The extent of excavation for service / utility trenches will vary. All excavations are anticipated to encounter made ground / sandy silt / clay and/or gravel. No rock breaking will be required as bedrock will not be encountered.
- The total volume of soil requiring excavation for the proposed development is expected to be ca. 2,500m^3. Based on preliminary engineering calculations it is anticipated that ca. 2,500m^3 of excess subsoil (native soil and made ground) will require offsite disposal. All such material will be removed and disposed of offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).
- The specific methodology will be determined during the detailed design / pre-construction phase.
- During the construction phase of the development, the following potential impacts on soils and bedrock could occur and have been assessed accordingly;

- Stripping of hardstanding and made ground may result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff;
- Soils beneath the proposed development may become unnecessarily compacted by machinery during construction;
- Dust generation can also occur during extended dry weather periods as a result of construction traffic; and,
- Soil may be at risk of becoming contaminated through Site construction activity; in particular the risk of spillages and leakage of any fuel oils and paint. Potential human health risks to construction workers could also occur associated with any such spillages and leakage.

These are likely to result in moderate negative effects on receiving soils and/or bedrock; however, any impacts are considered to be short-term and localised. Furthermore, mitigation measures will be implemented during the Construction Phase to reduce and/or avoid these potential effects, and to address any potential waste soil management issues.

11.4.2. Operational Stage

There will be no effects with regards to land (including land take), soils or geology during the operational phase, based on the nature, location and scale of the proposed development.

11.5. Mitigation Measures

11.5.1. Construction Phase

Stripping of hardstanding, made ground, and subsoil will be carried out in a controlled and carefully managed way, coordinated with the proposed staging for the development, and will be removed from Site as soon as possible. This material (ca. 2,500m^3) will be removed for offsite disposal to a suitably licenced / permitted waste facility. The Contractor, in consultation with the Client and the Engineer, will be responsible for removing and replacing with suitable material as required.

The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).

The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. All waste soils (including made ground) will be classified in accordance with the EPA Guidance Document *'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.

It will be the Contractors responsibility to ensure that a project specific Detailed Resource and Waste Management Plan (developed in accordance with relevant 2021 EPA Guidance) is fully implemented onsite for the duration of the project.

Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 12 - Water are also applicable to the protection of soils and geology during the construction phase:

- Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;
- The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;
- Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods;
- All excavated materials will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;

- A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;
- The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001) which are also detailed in Chapter 12 – Water; and,
- Specifically, regarding pollution control measures, the following will be adhered to;
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
  - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
  - All machinery will be serviced before being mobilised to Site;
  - Refuelling will be completed in a controlled manner using drip trays at all times;
  - Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water;
  - Ancillary equipment such as hoses and pipes will be contained within the bund;
  - Taps, nozzles or valves will be fitted with a lock system;
  - Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage;
  - Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills;
  - Only designated trained operators will be authorised to refuel plant on Site;
  - Procedures and contingency plans will be set up to deal with emergency accidents or spills;
  - An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment;
  - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and,
  - The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively.

The above mitigation measures will be incorporated (as required) during Detailed Design Stage and form part of the Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works). The CEMP submitted as part of this application may be altered if necessary, in light of conditions which may be imposed on the planning permission.

11.5.2. Operational Phase

No mitigation measures will be required during the operational phase.

11.6. Monitoring Requirements

11.6.1. Construction Phase

A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site.

11.6.2. Operational Phase

No monitoring will be required during the operational phase.

11.7. Residual Impacts

11.7.1. Construction Phase

The proposed development will not impact land (including land take). There will be no change in overall use of the relevant Airport campus lands.

Implementation of the measures outlined above will ensure that potential moderate impacts of the proposed development on soils and the geological environment do not occur during the construction phase, and that any residual effects (with the exception of offsite soil removal) will be slight negative and short term in duration, based on the nature, scope and location of the proposed development, and taking account of proposed mitigation measures.

The primary impact is the potential removal of ca. 2,500m^3 of waste soils (native soil and made ground) for offsite disposal (via. excavation). However all waste soils will be classified in accordance with the EPA Guidance Document *'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* (2015), prior to offsite disposal at an appropriate local authority permitted / EPA licenced waste facility. The relevant local authority registered, permitted and /or EPA licenced waste facilities will be operated and managed according to the relevant conditions of their waste permits or EPA waste licences. The Contractor will ensure that all waste soils are classified correctly (as per relevant EPA (2015) Guidance) and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation. The residual effect with respect to offsite soil removal is therefore likely to be slight negative and permanent.

No significant effects are likely to occur with respect to Land, Soils and Geology, as a result of the proposed development.

11.7.2. Operational Phase

There will be no effects with regards to land (including land take), soils or geology during the operational phase.

No significant effects are likely to occur with respect to Land, Soils and Geology, as a result of the proposed development.

11.7.3. Land, Soils and Geology and Human Health

Potential human health risks associated with quality impacts to soils arising from the proposed development during the Construction Phase have been identified as follows;

- Potential risk to receptors (i.e., construction workers) through direct contact, ingestion or inhalation with any soils which may potentially contain hydrocarbon concentrations from Site activities (potential minor leaks and spills of fuels, oils and paint).

However, this risk will be addressed by implementation of the mitigation measures outlined previously,

Taking account of the baseline environmental setting and the proposed mitigation measures during the Construction Phase, no human health risks associated with exposure to contaminants (via. direct contact, ingestion or inhalation) resulting from the proposed development are anticipated.

No significant effects are likely to occur with respect to Land, Soils and Geology and Human Health, as a result of the proposed development.

11.8. 'Do Nothing Scenario'

The Site is located within Dublin airport lands. In the do-nothing scenario the existing CBP site and FCB site will continue to operate. The do-nothing scenario will have a neutral and imperceptible effect on the Site with regards to Land, Soils And Geology.

11.9. Reinstatement

All temporary construction compounds and Site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architect's site layout plan and engineer's drawings. All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

12. Water

12.1. Introduction

This chapter describes the existing surface water and groundwater regime likely to be encountered beneath and in the general vicinity of the proposed development. It also addresses the potential impact of the proposed development on hydrology (i.e. surface water) and hydrogeology (i.e. groundwater) together with the mitigation measures that will be employed to eliminate or reduce any potential impacts. A detailed description of the proposed residential development (hereafter referred to as the Site) is presented in Chapter 2 – Project Description of the EIAR.

12.2. Study Assessment and Methodology

The following scope of works was undertaken by Atkins in order to complete this assessment: -

- Desk-based study including review of available historical information; and,
- Site Walkover Survey carried out by an experienced Hydrogeologist on 14th December 2022.

The purpose of the desk-based task is to characterise the current hydrological and hydrogeological setting of the Site. Relevant background information was compiled, specifically from the following data sources;

- Bing Maps Aerial photography (consulted 12/02/2023);
- Environmental Protection Agency (EPA) web mapping (consulted 12/02/2023);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater web mapping (consulted 12/02/2023)
- Google Maps Aerial photography (consulted 12/02/2023);
- Office of Public Works National Flood Hazard mapping web Site (consulted 12/02/2023);
- Ordinance Survey of Ireland (OSI) web mapping (consulted 12/02/2023);
- National Parks and Wildlife Service (NPWS) Map Viewer (consulted 12/02/2023);
- Water Framework Directive (WFD) Ireland web mapping (consulted 12/02/2023); and,
- Draft Ground Investigation information pack entitled '*NASAH North Apron & South Apron GI – Ground Investigation*' prepared by Causeway Geotech Ltd. (2022).

The ground investigation for the proposed development was carried out by Causeway Geotech Ltd between June 2022 to November 2022 in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007), BS 5930:2015, and BS 1377 (Parts 1 to 9). The full scope of ground investigation works completed is detailed in Chapter 11 – Land, Soils and Geology (exploratory locations are presented in Figure 11-1). Draft ground investigation information is presented within the Draft document entitled '*NASAH North Apron & South Apron GI – Ground Investigation*' prepared by Causeway Geotech Ltd (2022) and presented in Appendix 11.

Information obtained during the walkover survey, the ground investigation and routine surface water sampling events was supplemented by data gathered during the desk-based review of all available relevant site-specific and regional data.

This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*' (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, '*Geology in Environmental Impact Statements, A Guide*' (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments. This assessment has also been prepared in accordance with the relevant Environmental Protection Agency (EPA) guidance, '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' published in May 2022.

Separately, a Flood Risk Assessment (FRA) has been prepared by Nicholas O'Dwyer Ltd Consulting Engineers (2023) (Doc. Ref: D18362-02-NOD-ZZZ-ZZ-ZZZ-RP-C-520-0001) for the CBP in accordance with the following guidance document; '*The Planning System and Flood Risk Management – Guidelines for Planning Authorities*' DOEHLG 2009, and comprised the following key phases: -

- **Stage 1: Flood Risk Identification** - to identify whether there may be any flooding or surface water management issues related to the proposed development that may warrant further investigation;

- **Stage 2 Initial Flood Risk Assessment** – an appraisal of the adequacy of existing data and identified flooding risk, further confirming the extent (specific infrastructures) within the Project Boundary that are susceptible to flooding and which need further assessment.

Similarly for the SASC, a Stage 2 Flood Risk Assessment (FRA) has been prepared by AECOM (2023) (Doc. Ref: D18362-05-ACM-XXX-XX-XXX-RA-C-XXX-0001) in accordance with the relevant DOEHLG (2009) guidance

No difficulties were encountered during the data collection and assessment stages of this Water Impact Assessment.

12.3. Receiving Environment

12.3.1. Site Development

A review of historic maps (including available 6-inch historic maps, 25-inch historic maps, and aerial photographs (1995 to 2018) from the Ordnance Survey of Ireland) (OSI, 2023) and current aerial photography (Bing Maps, 2023) confirms that land use at the Site has generally been transformed over the years from greenfield use (including historic castle location) to airport infrastructure. The surrounding lands have been developed considerably since the late twenty century. A detailed summary of land use both in relation to the Site and surrounding lands is presented in Chapter 11 – Land, Soils and Geology.

12.3.2. Current Site Setting and Topography

The site is generally bounded by existing airport infrastructure. The proposed development at the US Customs and Border Protection (CBP) is bound to the west and south by airside infrastructure including pier 4 and by landside infrastructure to the north and east, including Terminal 2, and the proposed South Apron Support Centre (SASC) respectively.

The two-storey SASC, formerly known as the Flight Catering Building (FCB), is located to the southeast of the Terminal 2 Energy Centre and to the north west of Shamrock House.

The general land use within the site boundary is hardstanding (both airside and landside).

The topography of the Site is ca. 60m above ordnance datum (mOD) in the central part of the Site according to the ground investigation information (Causeway Geotech Ltd, 2022). Based on EPA ground elevation contours, the land topography in the wider area of the Site is generally 50mOD.

12.3.2.1. Potential Contamination Sources

On a regional scale there are several EPA licenced facilities within 5km of the Site (refer to Chapter 11 – Land, Soils and Geology for further details). Land use / activities within the wider airport campus and surrounding industrial lands would also be considered as potential contamination sources.

12.3.3. Flood Risk

A Flood Risk Assessment (FRA) has been prepared for the proposed CBP development by Nicholas O'Dwyer Ltd Consulting Engineers (2023) on behalf of daa as part of the supporting assessments required for this planning application. For the proposed SASC development, AECOM (2020) have reviewed available sources of information regarding flood risk in the area surrounding the proposed development site.

12.3.4. Proposed CBP Development

According to the Stage 1 Flood Risk Identification for the proposed CBP development *'the proposed CBP Project Boundary has been assessed to determine its susceptibility to fluvial and pluvial flooding, using available predictive data from available studies. This included assessment of scenarios with and without consideration of climate change effects. The results show no signs of fluvial flooding within proposed CBP Project Boundary for any scenario, with or without consideration of extreme climate change effects. The proposed CBP Project Boundary is mapped in Flood Zone C where probability of fluvial flooding less than 0.1%. The area within the proposed CBP Project Boundary was also checked for pluvial flooding as per the current Guidelines. The results of the OPW PFRA show no signs of pluvial flooding, albeit the scenarios assessed did not consider the effects of climate change. The results of the Dublin Airport SFRA show minor pluvial flooding within the CBP Project Boundary'* (Nicholas O'Dwyer, 2023).

The report found that pluvial mapping also shows pluvial flooding in nearby areas, albeit outside of the CBP Project Boundary (including along Terminal 2, the southern part of Pier 4, and "head-of-stand" roads). While

flood risk at these areas is not expected to increase as a result of the proposed CBP development, these areas were be considered to warrant a further Stage 2 assessment for the avoidance of doubt. A Stage 2 assessment was therefore completed.

A copy of the Flood Risk Assessment Report prepared by Nicholas O'Dwyer Ltd Consulting Engineers (2023) (document ref.: D18362-02-NOD-ZZZ-ZZ-ZZZ-RP-C-520-0001) is presented in Appendix 12.

Key conclusions presented in the technical report (Nicholas O'Dwyer, 2023) are summarised as follows:

- In Stage 1 of the assessment *'the development site was mapped in the "low-probability flood risk zone" – Flood Zone C. This indicated that the development site is suitable from a fluvial flood risk perspective. No fluvial flooding risk was identified in any of the information sources reviewed. In accordance PSFRM Guidelines, the pluvial flooding risk was also assessed for planned development. The available data identified a potential minor pluvial flooding risk within the Project Boundary, for the extreme scenario which considers the future effects of climate change. This resulted in the recommendation for further assessment at Stage 2.'*
- On further appraisal at stage 2 *'it was demonstrated that the paved area, where the potential pluvial flooding risk was identified, will be replaced by the proposed CBP building. Roof runoff from the CBP building will be conveyed directly to an underground pipeline, thereby avoiding the identified risk of pluvial flooding. Additionally, proposed new slot drains will offer improved collection in the remaining paved area adjacent to the building. The combination of upgrades to the slot drain collection capacity and a reduced paved area to be served by slot drains will serve to further alleviate any residual risk of pluvial flooding within the CBP Project Boundary.'*
- Based on these results *'it is concluded that no flooding risks have been identified which require further investigation at Stage 3. The proposed developments will not result in an increased flood risk, in fact, they will alleviate existing flood risk within the CBP Project Boundary.'*

12.3.5. Proposed SASC Development

A copy of the Stage 2 Flood Risk Assessment Report prepared by AECOM (2023) for the proposed SASC development is presented in Appendix 12.

Key conclusions presented in the technical report (AECOM, 2023) are summarised as follows:

- *'Following a review of historic information and predictive coastal and fluvial flood risk mapping, it has been concluded that the site is located within Flood Zone C with respect to both coastal and fluvial flood risk.'*
- *'Commercial/ office buildings are classified as Less Vulnerable development and are considered a suitable land use for the subject site and negated the need for a Justification Test. It is also noted that the proposed development will not increase flood risk elsewhere';*
- *'To provide an at source reduction in the rate of surface water discharged from the site, an attenuation tank has been incorporated in the surface water drainage network. The surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with the policy objectives set out in the LAP and the Greater Dublin Strategic Drainage Study (GDSDS) and will contain the 1 in 100-year event plus 20% climate change allowance'.*

12.3.6. Drainage Design and Climate Change

The proposed CBP Project Boundary lies in Zone C where the probability of fluvial flooding less than 0.1%. The design of all surface water drainage collection and conveyance systems includes an uplift factor of 20% to all rainfall data/events

Drainage infrastructure beneath the proposed SASC development have been designed to take account of potential changes in rainfall run-off rates associated with climate change (i.e. 1 in 100-year event including 20% for climate change). The potential impact of climate change on the proposed development with regards to drainage is assessed further within Chapter 8 – Climate.

12.4. Hydrology

There are no reported surface water features within the proposed development. There are two rivers located in the general vicinity. The Cuckoo Stream is located immediately south of the proposed development and flows in an easterly direction prior to discharge to the Irish Sea. The Sluice stream is located 1.4km north of the proposed development, and also flows in an easterly direction prior to discharge to the Irish Sea. The proposed development is located ca. 8km from the Irish sea. The Hydrological Features in the general vicinity of the Site are presented in Figure 12-1.

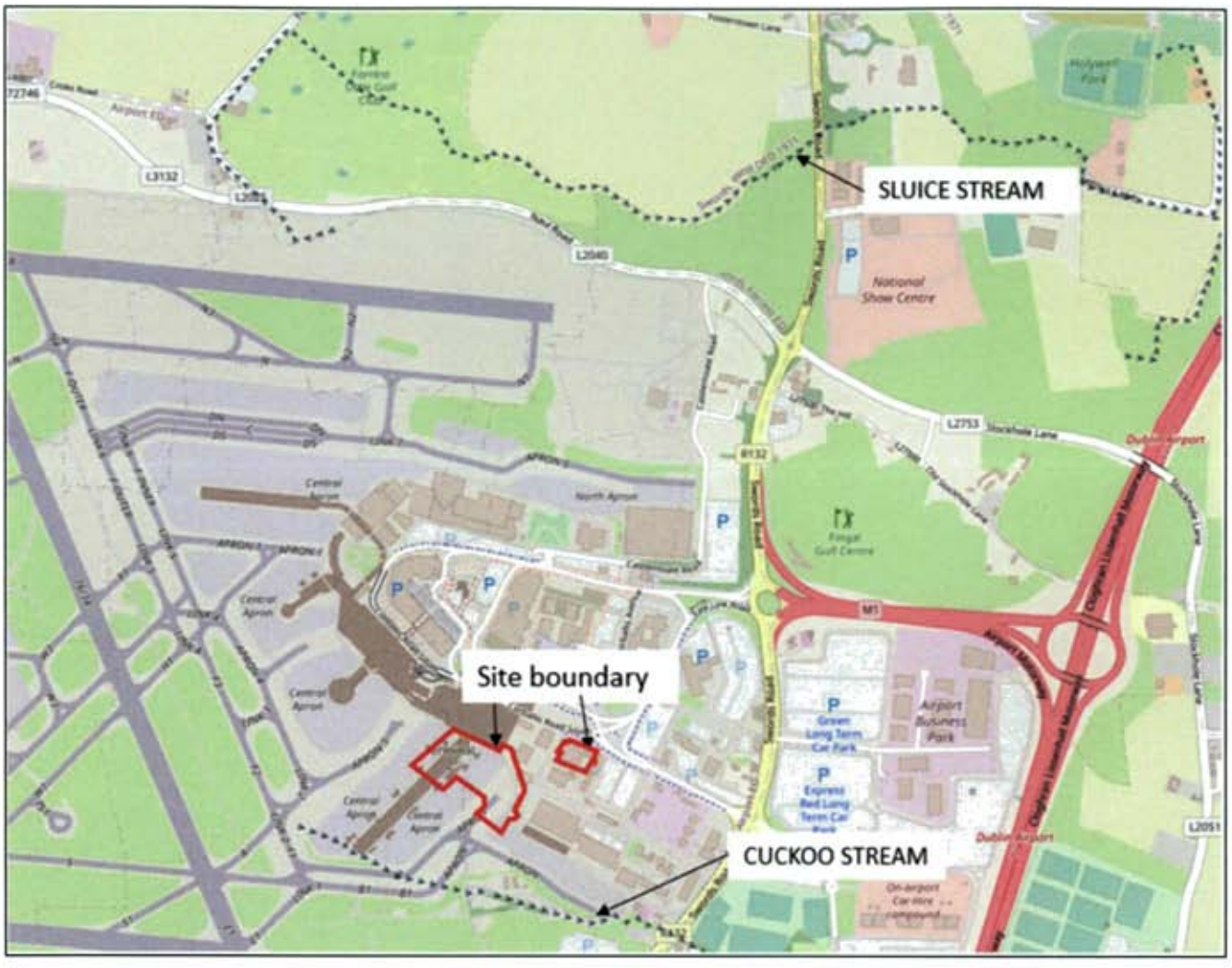


Figure 12-1 – Hydrological Features in the general vicinity of the Site (Source: EPA, 2023)

Feltrim Quarry geological heritage area (site code: DF005) is located approximately 3.3km northeast of the Site, as detailed further in Chapter 11 - Land, Soils and Geology. The geological heritage area is described by the GSI (2023) as a 'Working quarry on feltrim hill.' It is described by the GSI as *'exposed faces of lower Carboniferous limestone, shale locally fossiliferous'* (GSI, 2023). The proposed development will not have any Significant Impact on Feltrim Quarry geological heritage area.

12.4.1. Surface Water Quality

The EPA maintains a database of surface water features including rivers and lakes as well as water quality and risk status in accordance with the Water Framework Directive (WFD). The purpose of the WFD is to protect and enhance all waters including rivers, lakes, estuaries, coastal waters and groundwater as well as water dependent wildlife and habitats. This involves improving or maintaining current water quality status with the aim of achieving *'Good'* status for all waters; and mitigating against the risk of a decline in the water body quality status. The site is located within the Mayne_SC_010 WFD sub-catchment of the Liffey and Dublin Bay WFD catchment.

Both the Cuckoo Stream (south of the proposed development) and the Sluice stream (north of the proposed development) have been assigned *'poor'* river water quality status by the EPA, for the 2016 to 2021 monitoring period (EPA, 2023), as presented in Figure 12-2. The Cuckoo Stream is *'at risk'* of failing to meet the relevant WFD objectives by 2027 (EPA, 2023) while the Sluice stream is currently under *'review'* with regards to meeting the relevant WFD objectives by 2027 (i.e. additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken). Both streams ultimately discharge to the Mayne Estuary ca. 6km east of the Site, which is classified as having *'moderate'* transitional waterbody status by the EPA for the 2016 to 2021 monitoring period (EPA, 2023), and is currently under *'review'* with regards to meeting the relevant WFD objectives by 2027. The Mayne Estuary in turn discharges to the Irish Sea, which is classified as having *'good'* coastal waterbody status by the EPA for the 2016

to 2021 monitoring period (EPA, 2023), and is currently under '*not at risk*' with regards to meeting the relevant WFD objectives by 2027.

Figure 12-2 – Regional River Water Quality in the general vicinity of the Site (Source: EPA, 2023)

12.4.1.1. daa Surface Water Quality Monitoring

daa undertake routine surface water quality monitoring at key locations upstream and downstream of Cuckoo Stream (located south of the study area). Between the selected baseline monitoring two year period (2020 to 2022) the following surface water samples were collected:

- 28no. surface water samples were taken at the monitoring location SW-C-5. This monitoring station is located along the Cuckoo stream, upstream of the study area;
- 22no. surface water samples were taken at the monitoring location SW-C-7. This monitoring station is located along the Cuckoo stream, immediately downstream of the study area; and,
- 14no. surface water samples were taken at the monitoring location SW-C-9. This monitoring station is located along the Cuckoo stream, immediately downstream of the study area.

The resulting surface water quality data over the selected two year monitoring period was screened again the Surface Water Regulations - S.I. No. 272 of 2009 as amended (S.I. No. 327 of 2012, S.I. No. 386 of 2015, S.I. No. 77 of 2019, S.I. No. 659 of 2021 and S.I. No. 288 of 2022). The location of the monitoring stations as well as complete data tables of surface water analytical result, are provided in Appendix 12.

Results

The pH values ranged from 7.12 to 10.7 pH units (several pH exceedances are noted upstream of the study area, SW-C-5). The locations downstream of the proposed development are within the acceptable statutory range of values of 6.0 to 9.0 pH units.

Measured temperatures during the monitoring period ranged from 3.9 to 24^{O}C and this range is likely due to seasonal fluctuations in ambient temperatures and the associated impact on the surface water body.

The key contaminants of potential concern which could impact surface water quality via. storm water run-off from the area have been identified as Total Petroleum Hydrocarbons (TPH) and Ammonia (as N). Therefore, a detailed

evaluation of these concentration trends has been completed. Reported TPH concentrations for the monitoring period have not been detected downstream of the proposed development, above the relevant laboratory limit of detection (LoD), except for a singular event occurring on the 8th of March 2022, where a maximum concentration of 886 mg/l was reported at SW-C-7.

Reported Ammonia (as N) concentrations for the monitoring period ranged from <0.01 to 5.26 mg/L. Occasional exceedances of the relevant generic acceptance criteria (GAC) of 0.065 mg/L (as N) (Surface water Regulations (S.I. No. 272 of 2009) as amended 2015) were reported during the monitoring period at all 3no. monitoring locations. However, the criteria describe an arithmetic mean value. The mean values for the monitoring periods are as follows:

- SW-C-5 (upstream of development) – mean 0.061 mg/l;
- SW-C-7 (downstream of development) – mean 0.080 mg/l; and,
- SW-C-9 (downstream of development) – mean 0.042 mg/l.

It should be noted that the mean value of the SW-C-7 monitoring location (downstream) is heavily skewed by a singular sampling date, a concentration of 5.26 mg/l was recorded at this location on the 12th of April 2022. Excluding this singular event, the mean value for this location falls from 0.080mg/l to 0.065mg/l, which is within the relevant GAC.

Orthophosphate concentration ranged between <0.01 and 0.49mg/l, exceeding the 0.06 mg/l GAC. However, these exceedances are rare and occur only once at the SW-C-9 monitoring location on the Cuckoo stream (downstream of the proposed development) during the two year monitoring period.

Copper concentrations range from <2 to 33 ug/l, occasionally exceeding the 5ug/l GAC (Surface water Regulations (S.I. No. 272 of 2009) as amended). Overall trends show that these exceedances have been generally declining since 2020 at both downstream monitoring locations SW-C-7, and SW-C-9. A total of 10no. exceedances have been reported in 2020, with only 2no. exceedances reported in 2021, and only 1no. exceedance event in 2022 (12th of April 2022).

Based on the evaluated data presented in Appendix 12 and summarised above, no significant surface water quality issues have been identified at monitoring locations SW-C-7 and SW-C-9, along the Cuckoo stream, downstream of the proposed development. While occasional exceedances of the relevant GAC have been reported for several parameters (Ammonia, Orthophosphate and Copper) and hydrocarbon contamination has been detected once during the two year monitoring period, such exceedances / detections are temporary, with no evidence of any sustained upward trends.

12.5. Hydrogeology

12.5.1. Aquifer Characteristics

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification is primarily based on the permeability and thickness of subsoils), as presented in Table 12-1.

Table 12-1 - Groundwater Vulnerability Rating Table (Source: GSI, 1999)

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface. Groundwater vulnerability (in the bedrock aquifer) is predominantly Moderate(M) to High (H) in the vicinity of the Site, as presented in Figure 12-3 (GSI, 2023). This regional rating is confirmed by site investigation records for the general vicinity of the site. Areas of Extreme (E) and Rock at or Near Surface or Karst (X) vulnerability are noted to be present offsite, to the north of the Site.

The GSI has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on the size and hydrogeological characteristics of these aquifers. The classification for bedrock aquifers is Poor Aquifers (P) (which is generally unproductive except for local zone). Gravel aquifers are classified as not important within the site, as presented in Figure 12-4 (GSI, 2023). The Liffey Gravels are a locally important gravel aquifer located ca. 8.5km south of the Site.

The general vicinity of the Site is within the Dublin Groundwater Body (GWB). The Groundwater Body (GWB) is the relevant management unit under the WFD. Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters (GSI, 2021). According to the *'Dublin GWB: Summary of Initial Characterisation'* document (GSI, 2004), the majority of groundwater flow in the general region of the Site will be a rapid flow in the upper weathered zone but flow in conduits is commonly recorded at depths of 30 to 50 m below ground level. Groundwater circulation from recharge to discharge points will more commonly take place over a distance of less than a kilometre.

There is a karst feature, a 'spring' located ca. 4.7km east of the Site (GSI 2023). Based on the geological setting of the receiving environment, there is no potential for karst features (such as fractures or epikarst) to be present beneath the Site. Accordingly, the potential for karst connectivity, and groundwater flow via. conduit pathways does not warrant consideration as part of this assessment.

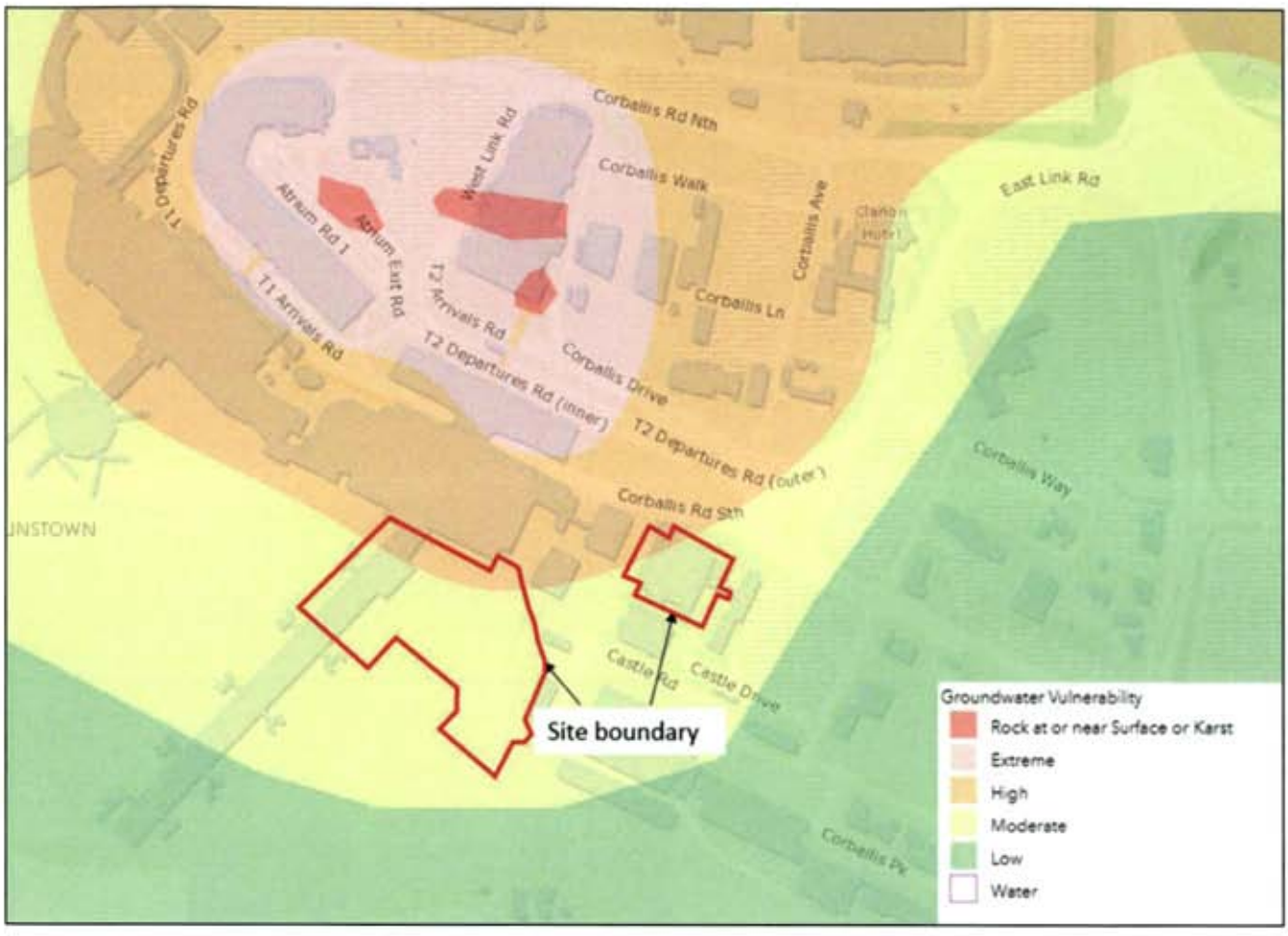


Figure 12-3 - Regional Groundwater Vulnerability Rating (Source: GSI, 2023)

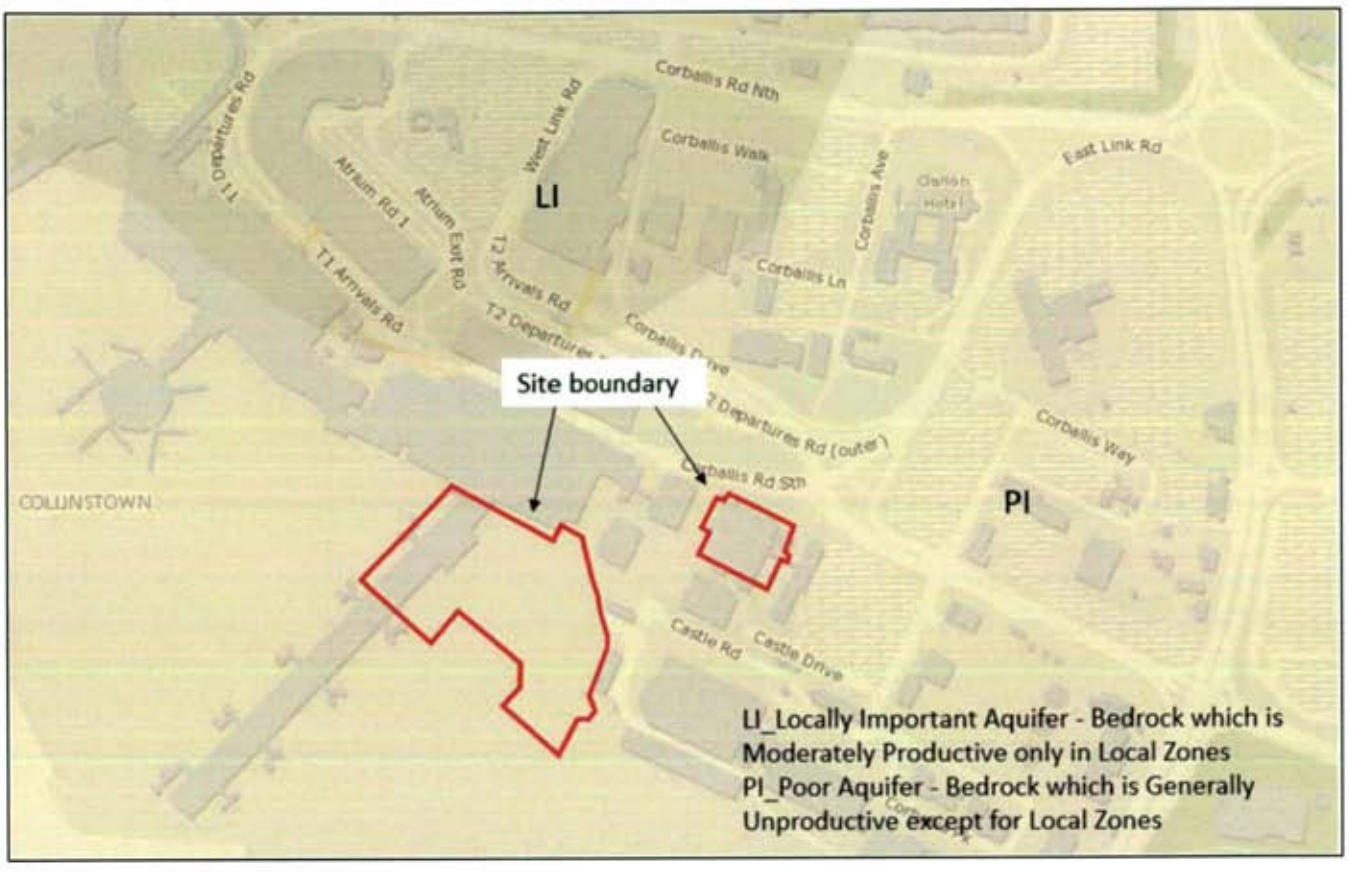


Figure 12-4 - Regional Aquifer Classification (Bedrock Aquifer) (Source: GSI, 2023)

12.5.2. Groundwater Recharge

Recharge is the amount of rainfall which infiltrates to ground and replenishes groundwater levels in the bedrock and gravel aquifers. It is dependent on the following key factors: effective rainfall (i.e. total rainfall less evaporation and surface water run-off), transpiration (i.e. uptake by vegetation) and aquifer characteristics (i.e. how easily the aquifer can accept water and store it). Additionally, not all effective rainfall will contribute to recharge due to impermeable materials in urbanised areas and associated drainage and water management infrastructure. The average recharge rate to the locally important bedrock aquifer beneath the general vicinity of the Site is reported to be ca. 66mm/yr (GSI, 2023).

12.5.3. Groundwater Levels and Flow Direction

No groundwater monitoring was carried out at the proposed site. Perched water was encountered within made ground material beneath the general vicinity of the proposed development at a depth of ca. 0.40mbgl (e.g. TP19, TP16) and in sandy/gravel/clay layers at a depth of ca. 2.7mbgl (e.g. TP17).

Inferred groundwater flow is expected to follow topography in a general easterly / south easterly direction, towards Cuckoo stream (in the south) and regionally towards the Mayne Estuary and Irish Sea (to the south-east).

The Site cover comprises hardstanding, therefore any rainfall percolation to the underlying made ground, and sand / gravel / clay layers will be negligible, with run-off instead being captured via. the existing onsite drainage system.

12.5.4. Groundwater Use & Available Resource

The GSI maintains a record of groundwater abstractions consisting of wells and springs, in addition to designated drinking water protection zones (referred to as Source Protection Areas). According to the GSI database, there are no group water scheme or public water supply abstraction points, or designated group water scheme or public water supply Source Protection Areas within the vicinity of the Site (GSI, 2023).

Based on the GSI database, there are 19no. wells and springs located within the general vicinity of the Site, as summarised in Table 12-2 and presented in Figure 12-5. Surface springs are also reported to be present within the general vicinity of the Site (albeit a location accuracy of 5km is noted) (GSI, 2023). Taking account of the

findings of the site walkover survey, and the reported location accuracy of these wells and springs, no groundwater abstraction wells or springs are known to be present within the Site boundary.

Table 12-2 - GSI Groundwater Abstractions Within Study Area (GSI, 2023)

Abstraction ID	Abstraction Type	Location Accuracy (m)	Approximate Location (relative to the Site)	Depth (m)	Yield (m^3/d)	Use
2923NEW034	Borehole	500	Potential location overlaps with Site	13.7	300 - good	Industrial use
2923NEW016	Borehole	500	ca. 1.69km south of the Site	35.4	109 - good	Domestic use only
2923NEW015	Borehole	500		48.8	130 – good	Industrial use
2923NEW037	Borehole	500		122	Unknown	Industrial use
2923NEW036	Borehole	500		91.4	87 – moderate	Industrial use
2923NEW061	Borehole	200		91.4	87 – moderate	Industrial use
2923NEW035	Borehole	500	ca. 4.1km south west of the Site	60	48.5 – moderate	Unknown
2923NEW017	Borehole	500	ca. 4.47km west of the Site	9.1	164 – good	Unknown
2923NEW024	Spring	100		Unknown	Low spring	Unknown
2923NEW023	Spring	100		Unknown	Low spring	Unknown
2923NEW021	Borehole	200	ca. 2.2km north of the Site	36.6	38.2 – poor	Agri & domestic use
2923NEW038	Spring	20	ca. 3.8km north of the Site	Unknown	Unknown	Unknown
2923NEW020	Borehole	500		27.4	220 – good	Unknown
2923NEW018	Borehole	500		46.9	110 – good	Industrial use
2923NEW019	Borehole	500		33.5	385 – good	Unknown
2923NEW039	Spring	20	ca. 3.0km north east of the Site	Unknown	Unknown	Unknown
2923NEW042	Spring	20	ca. 0.8km south east of the Site	Unknown	Unknown	Unknown
3223NWW007	Spring	20	ca. 3.4km north east of the Site	Unknown	Unknown	Unknown
3223SWW001	Borehole	100	ca. 4.6km south east of the Site	52.7	196 – good	Industrial use

Figure 12-5 - Registered Groundwater Wells in The Vicinity of the Site (Source: GSI, 2023)

12.5.5. Groundwater Quality

The European Communities Environmental Objectives (Groundwater) Regulations, (S.I. 9 of 2010) came into effect on 27th January 2010. The aim of the Regulations is to achieve the environmental objectives established for groundwater by Article 4 (1) (b) of the Water Framework Directive (2000/60/EC), as amended. The 2010 Regulations, as amended, set down groundwater quality standards for nitrate (50mg/L) and active substances in pesticides in Schedule 4 and also established threshold values for pollutants or indicators of pollutants in Schedule 5. Under these regulations the EPA must assign a status of '*Good*' or '*Poor*' to those bodies of groundwater where available data and knowledge allows.

Regional groundwater quality status for the 2016 to 2021 monitoring period (EPA, 2023) is classified under the WFD as '*Good*' beneath the CBP site (EPA GWB ref: Dublin) and the southern portion of the SASC site; however regional groundwater quality status is deemed by the EPA to be '*Poor*' under the main portion of the SASC site (EPA GWB ref: Industrial Facility P0480-02). Refer to Figure 12-6. The risk of failing to meet the relevant WFD objectives in the vicinity of the CBP site and the southern portion of the SASC site (Dublln GWB) by 2027 (EPA, 2023) is '*under review*'. Groundwater beneath the main portion of the SASC site (Industrial Facility P0480-02 GWB) has been identified as being '*at risk*' of failing to meet the relevant WFD objectives by 2027.

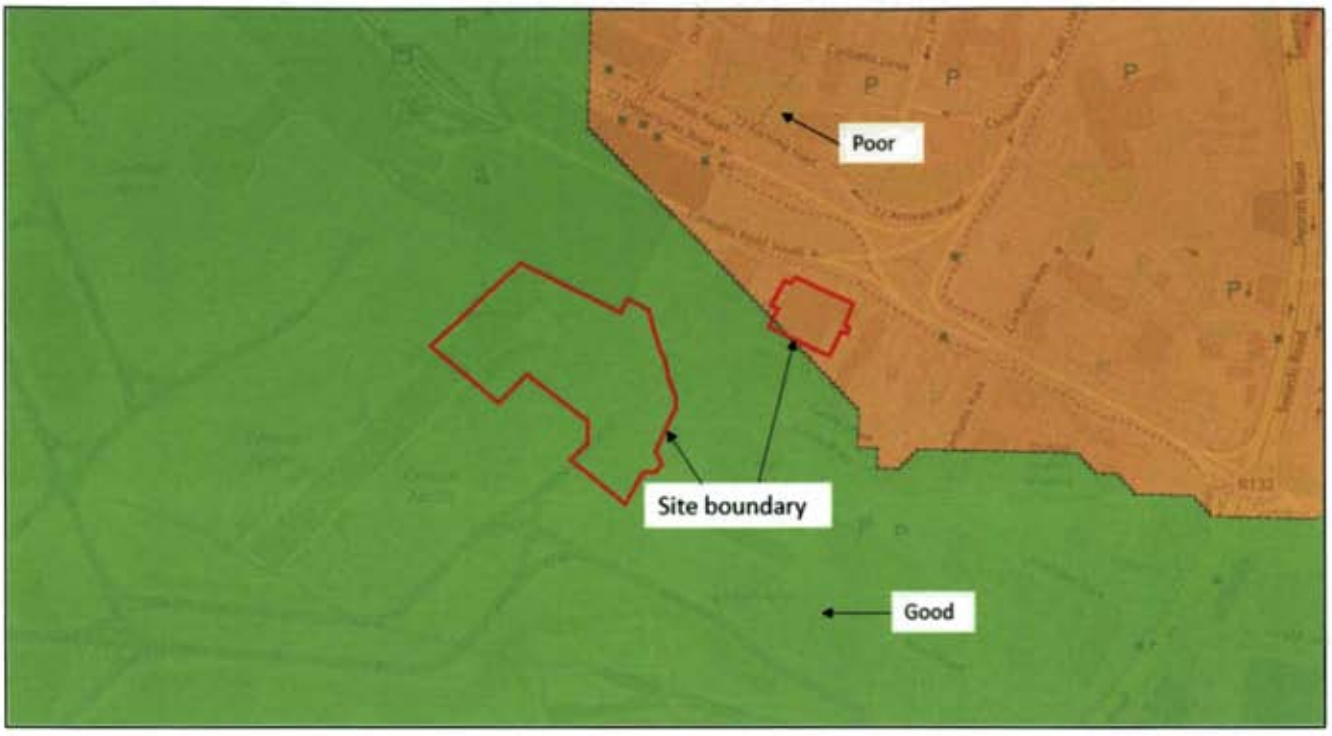


Figure 12-5 – Regional Groundwater Quality in the general vicinity of the Site (Source: EPA, 2023)

12.6. Potential Effects of the Proposed Development

12.6.1. Hydrogeological Conceptual Site Model

In addition to flood risk, the following criteria are typically applied when evaluating potential impacts to the water environment: -

- Effects to surface water / groundwater quality; and,
- Effects to surface water flows / groundwater resources.

In terms of surface water flows / groundwater resources, no significant effects are anticipated arising from the proposed development based on the following considerations: -

- According to the GSI (2023) database, there are 19no. groundwater wells located within the general vicinity of the Site. However, due to the nature, scale and location of the proposed development, any offsite groundwater abstraction wells are unlikely to be impacted by the proposed development.
- There will be no significant change to rainfall recharge rates at the proposed development.
- The maximum anticipated depth of excavation across the Site is ca. 4 mbgl. All excavations are anticipated to encounter made ground and sandy silt / clay and/or gravel. No rock breaking will be required. Based on encountered site-specific geological records, some dewatering (localised perched water) may be required during the construction phase. However, given that bedrock was not encountered in the vicinity of the Site in rotary boreholes drilled to a maximum depth of ca. 10.5m, the fact that the Site is underlain by a locally important aquifer (Ll - bedrock which is moderately productive only in local zones), and taking account of the localised nature of potential dewatering, no groundwater level impacts to regional groundwater resources, or surface water level/ flow impacts are likely as a result of potential temporary dewatering works during construction.
- Based on the proposed drainage design, surface water level/ flow impacts to are not likely to occur at either the Cuckoo Stream or the Sluice Stream.
- The design of surface water network upgrades has been carried out in accordance with the requirements of the Greater Dublin Strategic Drainage Scheme (GDSDS). The surface water network has been subject to hydraulic modelling, the results of which confirmed that the existing downstream network has sufficient hydraulic capacity to receive flows from the CBP drainage network. The hydraulic design has been carried out using InfoWorks ICM Software. InfoWorks ICM is an advanced integrated catchment modelling software which can model complex hydraulic and hydrological network elements. All drainage proposals associated

with the CBP Extension have been designed in accordance with the Dublin Airport Drainage Policy. Standard pollution control measures, including hydrocarbon interceptors as required, will be implemented as part of the proposed drainage works. Further details are provided within the drainage design drawings submitted as part of this planning application.

- The clean-only surface water pipeline proposed as part of the drainage design is inert and will form part of the future drainage network at Dublin Airport. This will avoid repeat construction at the CBP building in the future. The overall future drainage network, of which the clean-only surface water drainage pipeline will form part, will be the subject of a future planning application. Until then, it will, if permitted, serve no function unless and until the future drainage network receives planning permission
- No onsite groundwater abstraction is proposed during the operational phase. Based on the proposed design, typical excavation depths and encountered ground conditions beneath the vicinity of the Site, permanent dewatering will not be required during the operational phase.

Therefore, given the nature of the proposed development there will be no impact to regional or local groundwater resources or surface water levels / flows in the receiving Cuckoo stream. Accordingly, potential effects on groundwater resources, groundwater levels or surface water levels/ flows do not warrant further consideration.

The nearest European site is Malahide Estuary SAC/SPA, which is located ca. 5.2 km north east of the proposed development. There is no indirect or direct connectivity from the proposed development to Malahide Estuary SAC/SPA via water courses, woodlands, treelines or any other vectors, as detailed previously in Chapter 5 – Biodiversity. Similarly, the risk of any impacts to Feltrim Quarry geological heritage area (located ca. 3.3km northeast of the Site) have been screened out as being insignificant, as detailed previously within this chapter.

Based on general topographic levels, and distance from the Site, the Sluice Stream (located 1.4km north of the proposed development) is unlikely to be impacted by the proposed development, during the construction or operational phases. Based on distance and the site specific hydrogeological conceptual site model (CSM). any potential effects to the Irish Sea are unlikely during the construction or operational phases.

Three key receptors (in terms of surface water /groundwater quality) have therefore been identified as follows;

- Localised perched water within made ground / sand and gravel deposits beneath the Site;
- Bedrock aquifer beneath the Site (Poor Aquifer(Pl) - Bedrock which is Generally Unproductive except for Local Zones); and,
- Cuckoo stream located south of the Site (via. groundwater pathway).

The focus of this assessment will therefore be on potential groundwater quality and surface water quality impacts associated with the proposed development.

Based on relevant IGI guidance (2013) the generic type of geological/hydrogeological environment into which the proposed development will be placed has been determined as *'Type A – Passive geological / hydrogeological environment'*, defined by the IGI as *'areas of thick low permeability subsoil, areas underlain by poor aquifers, recharge areas, historically stable geological environments.*

12.6.2. Potential Effects on Water during the Construction phase

There is potential for degradation in groundwater and surface water quality resulting from potential pollution caused by construction activities e.g. plant, fuel/ chemical spillage etc., particularly during excavations. The maximum anticipated depth of onsite excavation will be approximately 4mbgl. During the construction phase of the proposed development, the following potential effects on surface water or groundwater quality could occur:

- Accidental spillages or leaks onsite in the vicinity of exposed groundwater / surface water pose a potential pollution risk as follows;
  - Based on available ground investigation records, perched water was encountered beneath the wider vicinity of the proposed development ranging from approximately 0.40mbgl (TP19, TP16) to 2.4mbgl (TP24). Therefore, perched water is likely to be encountered during excavation works within the shallow made ground / sand and gravel deposits. Localised areas of perched water beneath the Site, particularly in any areas where perched water is intercepted, would be highly vulnerable to water quality effects through accidental spillages or leaks of oils, fuels, paints or chemicals. This could result in likely moderate adverse temporary effects directly to the quality of groundwater receptors (i.e. perched water, and deeper bedrock aquifer), and likely slight adverse temporary effects indirectly (via. groundwater migration) to the quality of surface water receptors (i.e. Cuckoo stream).
- General Site activities during the construction phase associated with cement handling and pouring, pose a potential pollution risk as follows;

- Such general site activities could result in likely slight adverse temporary effects (via. groundwater pathways) directly to groundwater quality beneath the Site (i.e. perched water, and bedrock aquifer) and indirectly to surface water quality in the Cuckoo stream.

- Temporary dewatering may be required during excavation (where perched water levels are likely). However a dewatering plan will be designed by the Contractor as temporary works, including disposal of water to a suitably licenced [wastewater] disposal / recovery facility, and reviewed and approved by daa plc. prior to being fully implemented. Therefore potential dewatering will not likely have a significant effect on groundwater or surface water quality (namely the Cuckoo Stream).
- Existing subsurface contaminants could pose a potential pollution risk.

Mitigation measures will be implemented during the construction phase to further reduce these potential effects, and to address any potential water management issues; these are listed below in Section 12.5.

12.6.3. Potential Effects on Water during the Operational Phase

During the operational phase of the development, the following potential effects on surface water or groundwater quality could occur;-

- Groundwater and surface water receptors (i.e. perched water zone, bedrock aquifer, and the Cuckoo stream) could be at risk from occasional fuel / oil leaks along the access roads and paved areas. However given that the volumes arising from any such spills / leaks are likely to be very minor and taking account of the localised nature of such events, and site specific geological records, the potential risk to the perched water zone, and underlying bedrock aquifer is negligible and does not warrant further consideration. The drainage design includes for underground attenuation which is designed to slow and manage surface water drainage, along with hydrocarbon interceptors as required, before final outfall to the Cuckoo stream which will ensure there is protection to the natural flow regimes of the watercourse. Taking account of likely dilution effects the potential risk to the Cuckoo stream is negligible and does not warrant further consideration.
- Identified groundwater and surface water receptors could be at risk of quality impacts in the unlikely scenario of an unplanned event (traffic collision, emergency onsite fuel / oil spill, fire water arising from a fire). The risk of such an event occurring is low given the strict operating procedures daa are obliged to comply with on Dublin Airport lands. The proposed development will be designed, constructed and maintained in accordance with all relevant statutory building and fire safety requirements. Taking account of the proposed surface water drainage design, potential adverse effects to groundwater or surface water receptors (i.e. perched water zone, bedrock aquifer, and the Cuckoo stream) are negligible, and unlikely to occur, and do not warrant further consideration.
- Groundwater and surface water receptors are at risk of becoming contaminated through routine Site maintenance activity during the operational phase. Maintenance of the newly reconfigured structures, access roads and paved areas, utilities, foul, watermain and storm water drainage system, and attenuation tanks may result in small quantities of lubricant oils, fuel and chemicals being brought to the Site. In the highly unlikely event of a spill this could result in slight adverse temporary effects indirectly to the quality of groundwater receptors, and (via. groundwater migration) to the surface water quality of the Cuckoo stream. Mitigation measures will be implemented during the operational phase to avoid these potential effects.

12.7. Mitigation Measures

The mitigation factors and measures for the control of pollution and protection of surface water and groundwater quality are described below.

12.7.1. Construction Phase

With regard to groundwater and surface water quality effects the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented:

- The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines *'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)'* and *'Groundwater control: design and practice (second edition) (C750)'* and CIRIA 2015 *'Environmental good practice on site guide (fourth edition) (C741)'* to minimise as far as possible the risk of pollution.
- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 11 will be implemented onsite during the construction phase.

- The Contractor will be responsible for ensuring that the existing drainage network will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).
- In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented:
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.
  - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.
  - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
  - All Site vehicles used will be refuelled in bunded areas;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,
  - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.
- In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site;
  - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed perched water or the Cuckoo stream;
  - Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
  - Any spillages will be cleaned up and disposed of correctly;
  - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
  - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
  - Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,
  - Surplus concrete will be returned to batch plant after completion of a pour.
- Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations.
- In the unlikely event that ground contamination is encountered beneath the site during the construction works, all works will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance '*Guidance On The Management*

Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance *'Land contamination risk management (LCRM)'* (UK EA, 2021).

The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.

12.7.2. Operational Phase

With regard to groundwater and surface water quality effects the following mitigation measures are proposed;

- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 11-Land Soil and Geology will be implemented onsite during the Detailed Design Stage and Construction. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.
- All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;
- Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;
- In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and,
- A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.

12.8. Monitoring Requirements

Regular checks and maintenance of the proposed surface water drainage system should be implemented.

daa carries out monthly monitoring of key surface water locations across the airport campus and at key downstream locations including the Cuckoo Stream. This monitoring programme will continue during both the construction and operational phases of the proposed development.

12.9. Residual Effects

The development as proposed shall not result in an adverse impact to the existing hydrological regime of the area. The development will not result in any flood risk to the proposed site or surrounding lands. The proposed development is therefore considered to be appropriate from a flood risk perspective.

Taking account of the relevant mitigation measures, the residual impact to groundwater quality and surface water quality including receiving transitional waters (Mayne Estuary), resulting from potential pollution caused by Site activities e.g. plant, fuel/ chemical spillage etc. or associated with cement handling and pouring during the construction phase is likely to be insignificant being slight adverse and temporary. The residual impact to surface water quality, including receiving transitional waters (Mayne Estuary), resulting from excess loadings of suspended solids, via. inadequate onsite soil / storm water management, during the construction phase is slight adverse and temporary, taking account of the relevant mitigation measures. Any dewatering as required during the construction phase, will be temporary and will be containerised and disposed of to a suitably licenced waste disposal / recovery facility; therefore, dewatering will have no residual adverse impact on groundwater quality or surface water quality including receiving transitional waters (Mayne Estuary). In summary, anticipated residual adverse effects on surface water or groundwater will be temporary and slight adverse during the Construction Phase of the proposed development, given the mitigation measures proposed.

Taking account of the relevant mitigation measures, the residual impact to groundwater quality and surface water quality including receiving transitional waters (Mayne Estuary) resulting from occasional / routine Site maintenance works during the Operational Phase is likely to be insignificant being slight adverse temporary and

is unlikely to occur. The residual impact to groundwater quality and surface water quality resulting from occasional fuel / oil leaks during the operational phase is also likely to be insignificant being slight adverse and temporary, taking account of the relevant mitigation measures. The residual impact to groundwater and surface water quality, resulting from unplanned events during the operational phase (traffic collision, emergency onsite fuel / oil spill, or fire water arising from a fire), taking account of the relevant mitigation measures, is slight adverse, temporary, and unlikely to occur. In summary, anticipated residual adverse effects on surface water or groundwater likely to be insignificant being temporary and slight adverse, given the mitigation measures proposed during the Operational Phase of the proposed development.

Therefore, taking account of proposed mitigation measures, no significant adverse effects are likely to the receiving water environment arising from the proposed development during the construction or operational phases. On a regional scale, the proposed development is not likely to affect or result in further deterioration of the current '*Poor*' surface water quality status of both the Cuckoo stream and the Sluice stream and is not likely to affect the current '*moderate*' transitional waterbody status of the Mayne Estuary, or the current '*Good*' coastal water quality status of the Irish Sea, as required under the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (as amended). Similarly, the proposed development will not affect the current '*Good*' groundwater quality status of the Dublin Groundwater Body, and will not result in further deterioration of the '*poor*' groundwater quality status of the Industrial Facility Groundwater Body as required under the European Communities Environmental Objectives (Groundwater) Regulations, 2010, as amended. The proposed development will not be likely to cause a deterioration in surface or groundwater status or compromise the ability of any affected waters to comply with the objectives of the Water Framework Directive.

No significant effects to receiving surface waters or groundwater are likely as a result of the proposed development.

12.10. Water and Human Health

Taking account of the baseline environmental setting and proposed mitigation measures during both the construction and operational phases, any human health risks to onsite or offsite receptors as a result of groundwater or surface water effects will be imperceptible. No human health risks associated with long term exposure to contaminants (via. surface water or groundwater pathways) resulting from the proposed development are likely.

No significant human health effects (via. water) are likely as a result of the proposed development.

12.11. 'Do Nothing Scenario'

If the proposed development is not undertaken the baseline water environment would remain unchanged. The 'do-nothing' scenario would result in neutral effects with regards to hydrology and hydrogeology.

12.12. Reinstatement

All temporary construction compounds and Site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the engineer's drawings. All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

13. Cultural Heritage

13.1. Introduction

This chapter of the EIAR, prepared by Enda O'Flaherty (BA, H-Dip, PhD) of Rubicon Heritage Services Ltd, details the archaeological, architectural and cultural heritage issues that need to be addressed in respect of the following proposed development at Dublin Airport:

(1) the reconfiguration and expansion of the existing 2-storey US Customs and Border Protection (CBP) pre-clearance facility, which will consist of:

- (1a) the demolition of: 2no. existing Pier 4 link bridges; 2no. external vertical circulation cores (VCC) and 2no. airbridges; part of the north, east and south elevations of the existing CBP facility (c. 999m^2), including external footpaths, ramps and handrails; and part of the existing apron pavement (c. 5,000m^2);
- (1b) internal reconfiguration of part of Pier 4 and the existing CBP facility and the construction of an expanded 2-storey, part 3-storey CBP facility to the east of the existing CBP facility (c. 4,222m^2),
- (1c) decommissioning of existing operational aircraft stand 409 L/C/R, and the provision of temporary MARS operational aircraft stand 409T accommodating 2no. Code C or 1no Code E aircraft, as well as the realignment of the existing apron by way of new paint markings on the apron pavement.

(2) the partial demolition (c. 3,374.3m^2), refurbishment and upgrade of the existing 2-storey former Flight Catering Building, to become the South Apron Support Centre (SASC), which, together with its existing external hardstanding area to the north-west of the SASC, is to be used initially as a temporary construction compound (office storage and a pre-screening/ logistics/ staff welfare facilities) for the proposed works to the CBP facility, and then for continued use as an Airport Operational Building for airside support/operations, which will consist of:

- (2a) upgrade of the façade of the existing SASC building, to include partial demolition of the later attritions/extensions to the south and west flanks of the building; demolition of the existing pedestrian link bridge to Shamrock House to the east (making good the elevation of Shamrock House to match the existing), and demolition of an existing substation internal to the building;
- (2b) the refurbishment of the remaining SASC structure to provide offices, meeting rooms, staff welfare facilities, storage and plant rooms on the ground and first floors, and refurbished rooftop plant enclosure and new rooftop balustrades (c. 5,080.7m^2), as well as an external dining courtyard at ground floor;
- (2c) the provision of 10no. visitor car parking spaces, 2no. PRM visitor car parking spaces and 80no. cycle storage racks;
- (2d) revised external pedestrian and vehicular circulation arrangements; and
- (2e) separate external smoking shelter and separate external bin storage.

This study assesses the baseline archaeological and cultural heritage environment, in order to evaluate the likely effects that the proposed development will have on this environment, and to provide mitigation measures to avoid, reduce or offset these effects in accordance with the policies of the Department of Housing, Local Government and Heritage (DHLGH), The Fingal County Council Development Plan (2023-2029), the National Monuments Acts 1930-2014, as amended , and best practise guidelines.

13.2. Study Area

The study area has been defined in respect of two factors:

- The ability of sites/information sources to provide information pertaining to the archaeological potential of the proposed development site, and
- The potential physical effect, as well as effect on setting, that the proposed development may have on sites of cultural heritage significance.

Taking these factors into account the study area has been defined as follows:

Table 13-1 - Dimensions of the study area

Subject	Study Area
National Monuments and Recorded archaeological monuments (RMPs)	Within 500 m of the proposed development
Protected Structures and/or their curtilage	Within 500 m of the proposed development
Architectural Conservation Areas (ACAS)	Within 500 m of the proposed development
Structures recorded in the NIAH	Within 500 m of the proposed development
Unregistered features of cultural heritage	Within the proposed development
Townland boundaries	Overlain by the proposed development
Areas of archaeological potential	Within the proposed development
Previous Excavations	Within any townland traversed by the proposed development
Topographical files	Within any townland traversed by the proposed development

13.3. Methodology

This section presents the methodology used in assessing the baseline cultural heritage environment. The scope and methodology for the baseline assessment has been devised in consideration of the following guidelines:

- Environmental Protection Agency (2022) 'Guidelines on the information to be contained in Environmental Impact Statements'
- Department of Arts, Heritage, Gaeltacht and the Islands (DAHGI) (1999) 'Frameworks and Principles for the Protection of the Archaeological Heritage'
- Environmental Protection Agency (2003) 'Advice notes on current practice (in the preparation of Environmental Impact Statements)'
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (2017)
- Department of the Environment, Heritage and Local Government (2011) 'Architectural Heritage Protection Guidelines for Planning Authorities'
- National Roads Authority (2005) 'Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes'

13.3.1. Desktop Study

This assessment of the archaeological, architectural and cultural heritage of the proposed development area is based on a desktop study of a number of documentary and cartographic sources. The desktop study was further augmented by an examination of aerial photography as well as a field survey. The main sources consulted in completing the desktop study are listed here.

- Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for County Dublin
- Various editions of the Ordnance Survey of Ireland maps
- National Inventory of Architectural Heritage
- Excavation Bulletins Database (www.excavations.ie)
- Dublin Airport Local Area Plan 2020
- Fingal County Council Development Plan (2023-2029)
- Various published sources for local history
- Ordnance Survey Name books and Letters
- Excavations Bulletin
- Aerial Photographs
- Cartographic Sources

13.3.2. Field Inspection

The primary purpose of a field inspection is to assess local topography in order to identify any potential low-visibility archaeological and/or historical sites that are not currently recorded and which may be adversely effected by the proposed development. It is also the purpose of the field inspection to survey any known monuments or sites and to consider the relationship between them and the surrounding landscape, all of which need to be considered during the assessment process.

The methodology used during a field inspection involves recording the present land use as well as the existing topography for the entire area comprising the proposed development. A photographic record and written description are compiled for any known and / or potential sites of archaeological, architectural and / or cultural significance. In addition, a Global Positioning System (GPS) waypoint is taken for each identified site of said significance.

However, given the nature of the proposed development site, forming part of an already-developed operational airport that entirely comprises modern terminal buildings and modern apron surfaces, and an existing former Flight Catering Building with associated parking and yard space, it was deemed that there was no potential for any above-ground archaeological, architectural or cultural heritage sites or fabric to have remained *in situ*, and so no field inspection was undertaken.

13.3.3. Methodology used for assessing baseline value of sites

In order to categorise the baseline environment in a systemised manner, 'baseline values' have been assigned to each identified site of cultural heritage significance and / or potential within the study area. The baseline value of a site is determined with reference to the 'importance' and 'sensitivity' of the site.

In accordance with TII Guidelines, (NRA 2005) the importance of a site is determined based on the following criteria: legal status, condition, historical associations, amenity value, ritual value, specimen value, group value and rarity. The sensitivity of a site is determined based on its susceptibility to physical effect, as well as susceptibility to effect on setting.

It should be noted that the National Monuments Act 1930-2014, as amended does not differentiate between recorded archaeological sites on the basis of relative importance or sensitivity. In addition, the Planning and Development Act 2000 (as amended) does not differentiate between Protected Structures or Areas of Architectural Conservation on the basis of relative importance or sensitivity either.

Taking the above factors into consideration, the criteria that have been defined are provided in Table 13-2 below.

Table 13-2 - Baseline values of sites

Subject	Baseline Value
• Recorded Archaeological Monuments • Protected Structures • Architectural Conservation Areas (ACAs) • Shipwrecks known to be more than 100 years old or whose date is uncertain	Very High
• Sites listed in the NIAH that are not Protected Structures • Shipwrecks that are known to be less than 100 years old. • Unregistered built heritage sites that comprise extant remains which are in good condition and/or which are regarded as constituting significant cultural heritage features. • Unrecorded features of archaeological potential	High
• Unregistered built heritage sites that comprise extant remains which are in poor condition. • Unregistered cultural heritage sites (not including built heritage sites) that comprise extant remains. • Townland boundaries that comprise extant remains • Marshy/wetland areas	Medium/High
• Unregistered cultural heritage sites for which there are no extant remains but where there is potential for associated subsurface evidence. • Townland boundaries for which there are no extant remains	Medium/Low

• Unregistered cultural heritage sites for which there are no extant remains and where there is little or no potential for associated subsurface evidence	Low

Note: 'All other areas' collectively refers to the areas within the proposed development site that do not contain or comprise features of cultural heritage significance.

13.3.4. Type of Effect

The following Table 13-3 lists the type of effects that a proposed development may have on the cultural heritage resource (after Environmental Protection Agency, 2022):

Table 13-3 - Types of Effect

Types of effect	Definition
Direct	• Direct effects arise where an archaeological, architectural and/or cultural heritage feature or site is physically located within the footprint of the proposed development, or its associated physical effect zone, whereby the removal of part, or all of the feature or site is thus required.
Indirect	• Indirect effects arise when an archaeological, architectural or cultural heritage feature is not located within the footprint of the proposed development, or its associated physical effect zone, and thus is not effected directly. Such an effect could include effect on setting or effect on the zone of archaeological potential of site whereby the actual site itself is not physically affected.
Cumulative	• The addition of many effects to create a large, significant effect.
Undeterminable	• Whereby the full consequence that the proposed development may have on the cultural heritage resource is not known
Residual	• The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

13.3.5. Assessing physical effects

The methodology used to assess the magnitude of potential pre-mitigation effects, as well as residual effects, of the proposed development on the baseline environment is presented in Table 13.4 below (after Environmental Protection Agency, 2022)

Table 13-4 - Criteria used for rating magnitude of effects.

Effect Magnitude	Criteria
Severe	• Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, adverse effects only. These effects arise where an archaeology site is completely and irreversibly destroyed. • An effect that obliterates the architectural heritage of a structure or feature of national or international importance. These effects arise where an architectural structure or feature is completely and irreversibly destroyed by the proposed development. Mitigation is unlikely to remove adverse effects.
Major	• An effect which, by its magnitude, duration or intensity, alters an important aspect of the environment. An effect like this would be where part of a site would be permanently effected, leading to a loss of character, integrity and data about an archaeological feature/site. • An effect that by its magnitude, duration or intensity alters the character and/or the setting of the architectural heritage. These effects arise where an aspect or aspects of the architectural heritage is/are permanently effected leading to a loss of character and integrity in the architectural structure or feature. Appropriate mitigate is likely to reduce the effect.

	• A beneficial or positive effect that permanently enhances or restores the character and/or setting of a feature of archaeological or cultural heritage significance in a clearly noticeable manner.
Moderate	• A medium effect arises where a change to a site/monument is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised, and which is reversible. This arises where an archaeological feature can be incorporated into a modern-day development without damage and that all procedures used to facilitate this are reversible. • A medium effect to a site/monument may also arise when a site is fully or partly excavated under license and all recovered data is preserved by record. • An effect that results in a change to the architectural heritage which, although noticeable is not such that alters the integrity of the heritage. The change is likely to be consistent with existing and emerging trends. Effects are probably reversible and may be of relatively short duration. Appropriate mitigation is very likely to reduce the effect. • A beneficial or positive effect that results in partial or temporary enhancement of the character and/or setting of a feature of archaeological or cultural heritage significance in a clearly noticeable manner.
Minor	• An effect which causes changes in the character of the environment, such as visual effect, which are not high or very high and do not directly effect or affect an archaeological feature or monument. • An effect that causes some minor change in the character of architectural heritage of local or regional importance without affecting its integrity or sensitivities. Although noticeable, the effects do not directly effect the architectural structure or feature. Effects are reversible and of relatively short duration. Appropriate mitigation will reduce the effect. • A beneficial or positive effect that causes some minor or temporary enhancement of the character of an architectural heritage significance which, although positive, is unlikely to be readily noticeable.
Negligible	• An effect on archaeological features or monument capable of measurement but without noticeable consequences. • An effect on architectural heritage of local importance that is capable of measure merit but without noticeable consequences. • A beneficial or positive effect on architectural heritage of local importance that is capable of measurement but without noticeable consequences.

13.3.6. Assessing effects on setting

The definition of setting follows the guidance set by English Heritage as they have developed a range of comprehensive guidance on this subject specific to heritage assets (English Heritage 2005; 2008). Hence setting is not simply the visual envelope of the asset in question. Rather, it is those parts of the asset's surroundings that are relevant to the significance of the asset and the appreciation thereof, and in which a heritage asset is experienced.

In most instances setting will relate to the historical value of the asset, where an appreciable relationship between the asset and an element of its surroundings helps the visitor understand and appreciate the asset. This may be in terms of a physical relationship, such as between a castle and the natural rise that it occupies, or a more distant visual relationship, such as a designed vista or the view from, for example, one ringfort to another. The former is referred to as immediate setting and the latter as landscape setting. Many assets will only have an immediate setting. Some assets will have aesthetic value that relates to the surrounding landscape, such as in the case of a designed view incorporating a distant hill, or that relates to the contribution the asset makes to the local landscape, for example a church spire providing a focal point in a view down a valley.

English Heritage has provided a list of factors to be considered when assessing effects upon setting. These are broad factors and have been taken into consideration when assessing magnitude of effect and sensitivity. They are summarised in Table 13.5.

Table 13-5 - Factors to be considered when assessing effects upon setting (after English Heritage 2005)

Factor	Discussion
Visual dominance	Where an historic feature (such as a hilltop monument or fortification, a church spire, or a plantation belonging to a designed landscape) is the most visually dominant feature in the surrounding landscape, adjacent construction of the proposed development may be inappropriate.
Scale	The extent of a proposed development and the number, density and disposition of its associated elements will also contribute to its visual effect.
Intervisibility	Certain archaeological or historic landscape features were intended to be seen from other historic sites. Construction of a proposed development should respect this intervisibility.
Vistas and sight-lines	Designed landscapes invariably involve key vistas, prospects, panoramas and sight-lines, or the use of topography to add drama. Location of a proposed development within key views, which may often extend beyond any designated area, should be avoided.
Movement, sound or light effects	The movement associated with a proposed development may be a significant issue in certain historic settings. Adequate distance should always be provided between important historic sites and proposed developments to avoid the site being overshadowed or affected by noise.
Unaltered settings	The setting of some historic sites may be little changed from the period when the site was first constructed, used or abandoned. Largely unaltered settings for certain types of sites, particularly more ancient sites, may be rare survivals and especially vulnerable to modern intrusions such as wind turbines. This may be a particular issue in certain upland areas.

The following are guides to the assessment of magnitude of effect on setting:

- Obstruction of or distraction from key views. Some assets have been sited or designed with specific views in mind, such as the view from a country house with designed vistas. The obstruction or cluttering of such views would reduce the extent to which the asset could be understood and appreciated by the visitor. Developments outside key views may distract from them and make them difficult to appreciate on account of their prominence and movement. In such instances the magnitude is likely to be greatest where views have a particular focus or a strong aesthetic character. Sympathetic development may improve key views by removing features that obstruct or distract from key views and hence preserve or enhance the importance of the asset.
- Changes in prominence. Some assets are deliberately placed in prominent locations in order to be prominent in the surrounding landscape, for example prehistoric cairns are often placed to be silhouetted against the sky and churches in some areas are deliberately placed on ridges in order to be highly visible. Developments can reduce such prominence and therefore reduce the extent to which such sites can be appreciated or the contribution that they make to the local landscape. Similarly, sympathetic development can enhance the setting of such sites by, for example, removing modern forestry that would otherwise compromise the setting of a cairn that had been placed on a skyline.
- Changes in landscape character. A particular land use regime may be essential to the appreciation of an asset's function, for instance the fields surrounding an Improvement period farmstead are inextricably linked to its appreciation. Changes in land use can leave the asset isolated and reduce its value. In some instances, assets will have aesthetic value or a sense of place that is tied to the surrounding landscape character. Conversely, sympathetic development may restore or preserve the relevant land use and hence preserve or enhance the relevant value of the asset.
- Duration of effect. Effects that are long term or permanent are generally of greater magnitude than those that are short term.

Readily reversible effects are generally of lesser magnitude than those that cannot be reversed. Effects upon the defined setting will be of greater magnitude than those that affect unrelated elements of the asset's surroundings or incidental views to or from an asset that are unrelated to the appreciation of its value. The magnitude of effects can be rated from Negligible to Major using a similar scale to that for physical effects.

13.3.7. Methodology used for assessing significance level of effects

The significance level of a construction or operation effect on a feature is assessed by combining the magnitude of the effect and baseline value of the feature. The matrix in Table 13.6 provides a guide to decision-making, but it is not a substitute for professional judgement and interpretation, particularly where the baseline value or effect magnitude levels are not clear or are borderline between categories. The permanence of the effects are also taken into account, with irreversible effects being more significant while temporary or reversible changes are likely to be less significant.

Table 13-6 - Criteria for assessing significance level of effects

Magnitude of Effect	Baseline Value				
	Very High	**High**	**Medium / High**	**Medium / Low**	**Low**
Severe	Very significant	Very significant	Significant	Moderate	Slight
Major	Significant	Significant	Moderate	Slight	Slight
Moderate	Moderate	Moderate	Slight	Slight	Negligible
Minor	Moderate	Slight	Slight	Negligible	Negligible
Negligible	Slight	Slight	Negligible	Negligible	Negligible

13.3.8. Limitations of EIAR

There were no significant limitations or restrictions encountered during the compilation of this EIAR. All third-party reports, data and mapping are assumed to be correct for the purposes of this EIAR.

13.4. Receiving Environment

The proposed development site forms part of an already-developed operational airport that entirely comprises modern terminal buildings and modern apron surfaces, and an existing Flight Catering Building with associated parking and yard space.

13.4.1. Topographical and location details

The proposed development site is located within the Dublin Airport complex, crossing Collinstown and Corballis townlands in the parishes of Santry and Cloghran respectively. The surrounding environment generally comprises, low-lying flat lands with no notable prominences or significant landscape features, and with the landscape falling gently to the east toward Portmarnock and the North Dublin coast. There are no significant rivers or other landscape features within the study area.

13.4.2. Archaeological and historical context

13.4.2.1. Prehistoric period

The coastal area of north County Dublin has produced relatively large quantities of flints, many of which may date to the Mesolithic Period, (c. 7000–5000 BC). Within the wider landscape of the project, Mesolithic and Neolithic activity has been noted at the raised beaches at Sutton (Mitchell 1990; Stout & Stout 1992) and Portmarnock Football Club in Robswall townland (Keeling & Keeley 1994). Further north, systematic field walking at a proposed site for Malahide Football Club in 1999 revealed lithic material (Keeling & Keeley 1994; Purcell 1999). Other evidence for Mesolithic activity along the coast derives from fishing, such as fish traps. Wooden fish traps were recently discovered on the Mesolithic shoreline 5m below current ground level in the Spencer Dock area of Dublin City (McQuade 2008). The fish traps were constructed almost exclusively of hazel, with evidence of tool marks, and dated between 6100–5720BC. There are no recorded Mesolithic sites within the study area of the proposed development.

There is some evidence for activity within the wider north County Dublin area during the Neolithic period (c. 4,000BC– c 2,300 BC). Evidence includes a large, well preserved portal tomb at Howth Demesne, while excavations at Feltrim Hill revealed Neolithic ceramics and worked lithics, though no apparent remains of structures. Recent excavations on Lambay Island revealed areas of Neolithic activity associated with stone axe and flint tool manufacturing, some of which was of extremely high quality (Cooney 2000). The highest points of Lambay Island also have at least two cairns, mounds of stone that often cover burials, which may also date to the Neolithic. Stray finds of stone axeheads are common with examples recorded throughout Fingal.

Records held by the National Museum of Ireland indicate the presence of a Neolithic population in Fingal due to the discovery of stray artefacts dating to this period. Flint scatters dating to the Neolithic Period are commonly found along the north Dublin coastline, the largest of which is located at Paddy's Hill, Robswalls, south-east of Malahide and approximately 3.4 km northeast of the proposed project. Nearly 3,000 stone tools, including axeheads, flint scrapers, blades, knives and arrowheads, were recovered from this area.

The archaeological evidence surrounding the study area points to activity here during the Bronze Age. Two ring ditches (a funerary monument) are noted in the townlands Shanganhill (DU03905) and St. Doolagh's (DU00725). Barrows are burial monuments of the Bronze Age and Iron Age and usually consist of a circular central area, which may be flat or slightly dished (a ring-ditch) or domed (a ring-barrow), enclosed by a ditch and occasionally by an external bank. In the Belcamp Hall development, on the eastern side of the proposed route, a circular cropmark that was thought to represent a possible ploughed-out barrow (SMR DU015-116), was subsequently identified by archaeological testing as an early modern designed landscape feature.

Although the most common archaeological site throughout Ireland with over 7000 known sites (Waddell 2010), no fulachtai fia/burnt mounds have been identified within the study area, with only two examples known in close proximity to the project in the townlands of Fosterstown South (DU11151) and Ballymun (DU141119). Fulachtaí Fia consist of a low mound of burnt stone commonly in horseshoe shape and are found in low-lying marshy areas or close to streams. The presence of fulachtaí fia is often indicative of Bronze Age seasonal communal activity in river valleys, lakeshores and boggy ground; scientific dating of a randomly excavated sample has shown a predominance of second millennium BC dates for their use (Brindley & Lanting 1990). There is no agreement that burnt mounds were cooking places, although it does seem that they were used to prepare large quantities of boiling water and that they were repeatedly used, resulting in a large mound of heat shattered stones accumulating. Other theories for the use of these sites include bathing, saunas or sweathouses, washing or dyeing large quantities of cloth, the preparation of leather and brewing.

13.4.2.2. Early Medieval Period

The early medieval period saw the development of a mixed-farming economy managed by kings, nobles and free farmers. There was an increase in settlement during the early medieval period (c. AD 500–AD 1200), and the ringfort, otherwise known as the 'rath' or 'fairy fort', is the best-known native monument of this period (Stout 1997).

Ringforts are essentially enclosed farmsteads dating to the early medieval period. The majority of these sites are univallate, surrounded by one ditch and bank, but some are surrounded by two and, to a lesser extent, three enclosing ditches and banks (known as bivallate and trivallate raths respectively). Although ringforts are the most common archaeological site in the country, they are a site type that is relatively scarce in the archaeological record for County Dublin. This is partly because of the urban or suburban nature of much of the county, but also because of the intensive agricultural practices carried out in north County Dublin, which has destroyed surface traces of these sites. The survival of destroyed ringforts or enclosures sub-surface has been demonstrated in the surrounding townlands, where geophysical survey and testing have identified the remains of several possible early medieval enclosed settlements, some of which are quite substantial in size (e.g. SMR sites DU015-117 & DU015-134 in Drumnigh townland). In addition, cropmarks have been recorded in Saint Doolaghs townland which may represent the remains of a ringfort and associated field system (DU015-123 & 124). In total there are seven enclosure sites within 2km of the proposed development site.

There are two significant ecclesiastical sites of possible early medieval foundation located within 3 km of the proposed development site. Early Medieval monastic settlements are often defined by a large curvilinear bank and ditch or stone enclosure (topography permitting), enclosing an area circa 90-120m in diameter, often preserved in the line of townland or field boundaries and roads (Swan 1998). The majority of ecclesiastical settlements had one or more concentric curvilinear enclosures, with the church placed at the centre, in the inner sanctum (frequently preserved in the surviving graveyard boundary), with more secular activities (domestic, commercial and industrial) reserved for the outer enclosures. They usually had a network of radiating roads, with the principal approach road (often from the east) terminating in a triangular marketplace.

One such example is the ecclesiastical settlement associated with St Doolagh's Church located east of the proposed development site. Not much is known about the founder of the church, St Doolagh; the earliest reference to him is found in the 9th century Martyrology of Oengus where he is referred to as 'Duilech of Clochar', though he probably lived in the early 7th century (Appleyard 1985). The church itself was constructed in the same style as Cormac's Chapel at Cashel and St Kevin's at Glendalough. The site incorporates most of the other features commonly associated with an ecclesiastical settlement including a burial ground, a Holy Well, a cross and an enclosure. There may have been occupation of the site from the 6th or 7th century (Moss 2003, 124). A geophysical surve (Nichols 2009) identified several gullies, pits and possible kiln locations which points to human industry having taken place there. To the South of the church is a sub-rectangular network of ditches (DU015-009008-) which are likely enclosure remains contemporary with early settlement at St Doulaghs. West of the

church is the possible remains of a sub-circular enclosure (DU015-009009-) which is not contemporary with the current settlement location of St Doolagh's.

To the west of the proposed development site in the townland of St. Margaret's there is another ecclesiastical settlement of possible early foundation; (DU00578) represent the remains of the medieval parish church and associated features which lie in the western end of a graveyard (DU00579/11348001) north of St. Margaret's village. This site has been described as the 'old church' in the Civil survey (1654-6) Simington 1945, 209; Tutty 1979, 155-157). The church was originally called Donaghmore and probably fell into ruin between 1630 and 1650.

The proposed development is located within the bounds of Fingal, the regional name applied to the northern half of County Dublin and although there is no direct evidence for Viking settlement within the study area, the Fingal area has strong Viking connections. According to Ball (1920), the name Fingal is used to denote the district into which predatory excursions were made by the Vikings. In the 9th century, a colony of Ostmen, or Northmen, was established in Dublin, ultimately settling in the tract lying northwards along the coast, which became known as Fine Gall or 'the territory of the strangers'. Bradley suggests Viking Dublin should be looked at as part of 'the rurally settled area of the Dublin Scandinavians' rather than as a number of successful trading settlements strategically located along the coast (in Simms & Fagan 1992). It is known that the Vikings used Baldoyle (to the east of the proposed development) as a harbour base and the placename probably derives from this settlement (baile dubh gaill or 'place of the dark stranger' is likely to be a reference to the Vikings of Danish origin, as they were darker-haired than the Norwegians. The early Viking settlement was located further inland than the present-day village, as the seashore was at a higher level than it is today (Hurley 1983).

13.4.2.3. Later Medieval Periods

From the 12th century, the Anglo-Normans, with a keen eye for good agricultural land, superimposed the manorial system of landholding they had acquired from England and the Welsh borderlands onto their newly conquered territory in Fingal. The majority of Anglo-Norman manors were on, or close to, rivers, and they often preferred established sites with an existing infrastructure (whether secular or ecclesiastical). The manor of Balgriffin was founded on land granted to a Welsh man by the name of Griffin at the end of the 12th century (it was originally known as Baile Hamund, becoming Baile Grifin – Balgriffin – after the new landowner; Walsh 1888). The manorial castle and church (DU015062 and DU015012) were erected in the lands of the present Balgriffin Park, which is located on the opposite side of the R107 road. It was a strategic location, on the north bank of the River Mayne and close to the established ecclesiastical settlement of St Doolagh.

The only RMP located within the study area relates to this period: CH001 represents the site of an unclassified castle. The location of this castle is known only from the 1st Ed 6-inch Ordnance Survey sheet. A variety of historical and cartographic evidence combine to suggest that the building may have been razed in 1641/2 by the forces of the Earl of Ormond. The castle's occupant at that time was involved in the provisioning of Confederate troops besieging Drogheda late in 1641, and Ormond repaid such participation, in Fingal and parts of County Meath particularly, with targeted violence. The demise of the structure in the early 1640s is also implied by the discovery of reused dressed medieval stones in the original, mid-17th-century, vernacular cottage at Corballis House.

13.4.2.4. Toponomy of Townlands

The Irish landscape is divided into approximately 60,000 townlands and the system of landholding is unique in Western Europe for its scale and antiquity. Research into the names (toponomy) of these land units frequently provides information relating to the townland's archaeology, history, folklore, ownership, topography or land use. Most placenames (including townland names) were anglicised by the time the Ordnance Survey began in the 1830s. However, despite some inaccuracies in translation, the Gaelic, Viking, Anglo-Norman and English origins of place names are generally recognisable. A study of the townland names can provide information on aspects of cultural heritage including descriptions of the use of the landscape by man and the potential presence of archaeological or cultural heritage sites or features.

The proposed development extends through or effects on two townlands.

Table 13-7 - Townlands within the proposed development site.

English Name	Irish Name	Glossary
Corballis	An Corrbhaile	Townland, town, homestead of the round hill, pointed hill, hollow; pointed, conspicuous, odd
Belcamp	Baile Choilin	N/A

13.4.2.5. Recent Excavations

The Excavations Bulletin is an annual account of all excavations carried out under license. The database is available online at www.excavations.ie and includes excavations from 1985 to 2020. This database was consulted as part of the desktop research for this report to establish if any archaeological investigations had been carried out within the townlands of the proposed development. The database produced four examples of licensed archaeological investigations undertaken within the townlands incorporated by the study area. Of these four investigations, two sites did not identify any archaeological deposits. The remaining archaeological investigations comprised two excavations, both in the vicinity of the site of Corballis House.

In 2006, test excavation and monitoring was carried out on the proposed site of a new terminal building at Dublin Airport. The works on site included the monitoring of geotechnical site investigations, monitoring the removal of plaster render from Corballis House and the excavation of test-trenches around the site of Corballis House and within the constraint area of a 'castle site' (DU014–011).

Nothing of archaeological interest was uncovered during the monitoring of the geotechnical site investigations. The test-trenches indicated that a layer overlying subsoil consisted of made ground containing a mix of clays and post-medieval artefacts, including red brick, modern glass, wood and post-18th-century pottery. The area has been levelled in recent times and resurfaced as a carpark.

Test excavation adjacent to the castle, described as a 'castle in ruins' on the OS maps, focused on establishing if any remains survived subsurface. The test locations in this area were confined to the grassy margins, as the remainder of the areas function as existing airport catering facilities, aircraft hangars and car parking bays. As uncovered in Trenches 1 and 2, an extensive network of services supply the surrounding buildings. Trenches 4–6 were halted at varying depths above active service conduits supplying power, heating and telephone services to the existing airport buildings. As a consequence, the soil profiles in many instances consisted of modern landscaped ground over backfilled trenches.

At the eastern end of Trench 3, natural ground at 0.4–0.5m was located below present ground level. It lay directly beneath a layer of made ground that included plastics and other modern material. There was no evidence of a buried sod horizon, suggesting that the ground was scarped and levelled in this area. Much of the surrounding area is occupied by buildings and roads.

Trench 9 uncovered a post-medieval field ditch, suggesting that elements of the old ground surface still survive in places. As a consequence, it was recommended that an area measuring 50m by 50m centred on the site of the 'castle' as marked on the OS maps be opened as an archaeological exercise in advance of the development proceeding.

The architectural investigations and opening up works at Corballis House were undertaken to assess the structural stability of the house and to examine the fabric of the walls as part of a condition survey. In addition to the removal of plaster render, the opening up works involved the excavation of two test-pits around the foundations of the house.

Test-trench 1 measured 0.9m along the north–south rear wall of Corballis House. It was 0.85m wide (east–west) at the base and was excavated to a depth of 1.2m below the existing ground level. The trench revealed that the foundation of the rear wall of Corballis House extended 0.76m below the existing ground level. This wall was built upon a shallow narrow foundation plinth, 0.22m deep. The plinth was set 0.05m out from the line of the wall and had a slight basal batter. A cobbled surface extended from the foundation plinth, 0.96m below the ground level, laid above the boulder clay. The cobbling (measuring 0.06 by 0.07m by 0.04) included fragments of red brick in its fabric. A shallow depression/drain was present in the cobbles, indicating that water drained along the axis of the house wall. A fragment of an 18th-century wine bottle and a single sherd from a blackware milk pot were recovered from the green sandy clay fill above the cobbles, indicating that the cobbling dates from at least the late 18th/early 19th century. Various other rubble drains and pits were located in the upper 0.6m of the trench. The wall revealed in section was a roughly coursed limestone masonry wall. The boulder clay consisted of a compact and stiff blue/brown natural boulder clay mixed with gravel.

Test-trench 2 measured 1m north–south by 1.2m and was excavated to a depth of 1.15m below the existing ground level. The trench revealed a rectangular sectioned foundation set 0.16m out from the external line of the house wall. The foundation was roughly coursed (with three courses) and was constructed from stones measuring c. 0.15m by.015m to 0.16m by 0.28m. Red brick was occasionally used in the fabric of the foundation. The foundation was 0.43m deep and was identified 0.4m below the existing ground level. The foundation was built upon a compact and stiff blue/brown natural boulder clay mixed with gravel.

Plaster render was removed from key surfaces at Corballis House. The removal of plaster render from the building confirmed the suspicion that an earlier structure was contained within the later extended late 18th/early 19th-

century house. This early building appears to be a simple rectangular stone structure; it is likely to have functioned as a dwelling and appears to be the structure illustrated on the Down Survey map in the mid-17th century.

The definitive identification of the c. ad 1600 building is based upon a number of observations. The floor level in the rear kitchen of the house is lower than the floor in the remainder of the building, such as the hall and bow. There is no obvious explanation why this would be so if the building dated principally from the late 18th/early 19th century. The ground plan of the house is unusual and irregular and suggests that the building was constructed sequentially; the unusual ground-floor plan is reflected in the plan of the roof. The wall fabric in the rear house wall is exclusively fashioned from limestone masonry. The wall fabric in the front façade and in the hexagonal bow (adjacent to Test-trench 2) is made from combinations of masonry and red brick. The differential fabric of the walls suggests that these elements of the house belong to two separate phases within the building's history. Clearly the bow, with its decorative plasterwork, is late 18th/early 19th-century in date. Accordingly, the rear walls are likely to be earlier.

The main dating evidence for the earlier structure is based upon the chamfered masonry identified when plaster render was stripped from the external face of the rear house wall. These architectural fragments, when considered in combination with the wall thickness, suggest a building that dates from the early post-medieval period (c. ad 1600). The building is also illustrated on Rocque's map of 1760, before it was extended in the late 18th/early 19th century. It is possible that the chamfered stone has been taken from another building, the most likely candidate being the castle site (DU014–011).

The early elements of Corballis House that have survived extensive remodelling are fragmentary and hidden within the later fabric of the building. There is no record of an earlier building in the National Inventory of Architectural Heritage report on the house. The walls of the earlier building appear to survive to roof level, where they have been incorporated into the present house. Further opening-up works will establish this for certain.

Subsequent to the 2006 investigations, excavations were undertaken in February–April 2007 in response to a joint request from the National Monuments Service and the Heritage Policy and Architectural Protection Unit, DoEHLG, to gather data on aspects of Corballis House, particularly its origins and pre-1700 history. The investigations were restricted by the necessity of leaving the building intact and restorable until a planning decision could be made about its future.

The investigations involved the excavation of six 'keyhole' trenches inside Corballis House a large open excavation to the west of the building, a slot-trench along the south of the building (restricted by the proximity of numerous, active, modern underground services), a trench to the north of the building and an open area excavation to the east (for a total outside excavated area of over 975m^2). The investigations also involved analysis of the surviving, upstanding building fabric, both a re-examination of fabric examined previously for the earlier building survey and scrutiny of new fabric (including 60m^2 of interior wall, from which plaster was removed, and more than a third of the exterior walls, from which render was removed). Once a picture began to emerge of the dimensions and appearance of the earlier phases of Corballis House, a survey of comparative vernacular structures in the surround area was undertaken by Tim Murphy and the writer to provide a context for understanding the building at that time.

Following the granting of planning permission for Terminal 2, additional investigations were carried out at Corballis House in October–November 2007. These included further analysis of the standing building and the removal of much larger areas of wall plaster/render, as well as the excavation of exterior areas that were not previously accessible (totalling an additional 168m^2). The further standing building analysis was undertaken in coordination with the conservation architect and specialist contractors involved in salvaging and removing the building's architectural features (window surrounds; plaster niches; doors, door surrounds and fanlights; stairway balusters, newel posts and rails; Victorian encaustic tiles). Once all this work was complete, the building was demolished in a phased manner to allow further archaeological analysis of its remains during the process. Finally, following demolition and the removal of the standing structure, excavation of the remaining interior area not previously accessible was undertaken.

13.4.2.6. DU014–011 ('castle, site of')

Early historical maps depict the location of a ruinous castle (tower-house) in the corner of a field, some 220m south-east of Corballis House. A variety of historical and cartographic evidence combine to suggest that the building may have been razed in 1641/2 by the forces of the Earl of Ormond. The castle's occupant at that time was involved in the provisioning of Confederate troops besieging Drogheda late in 1641, and Ormond repaid such participation, in Fingal and parts of County Meath particularly, with targeted violence. The demise of the structure in the early 1640s is also implied by the discovery of reused dressed medieval stones in the original, mid-17th-century, vernacular cottage at Corballis House.

While groundworks across the Terminal 2 site were being archaeologically monitored/inspected, work in the vicinity of the former castle site – beneath tarmac, and modern concrete block and corrugated steel buildings –

was overseen with particular scrutiny in December 2007 and early 2008. The very bottom of a former late post-medieval boundary ditch was identified, but the ground across the area had been heavily truncated by airport works, including trenches for services feeding the terminal, the control tower and various neighbouring buildings. No archaeology was identified in the vicinity of the RMP site.

13.4.3. Designated archaeological and architectural sites.

13.4.3.1. Record of Monuments and Places (RMPs)

Section 12 (1) of the National Monuments Act 1994 made provision for the establishment and maintenance of a Record of Monuments and Places (RMP). Under this Act, each site recorded in the Record of Monuments and Places is granted statutory protection. When the owner or occupier of a property, or any other person proposes to carry out, or to cause, or to permit the carrying out of any work at or in relation to a recorded archaeological monument they are required to give notice in writing to the Minister for Housing, Local Government and Heritage 2 months before commencing that work.

There is one RMP located within the study area:

Table 13-8 - RMPs located within the study area

CH Number	Type	Number	Townland
CH001	Unclassified Castle (Site of)	DU014-011----	CORBALLIS (Coolock By.)

CH001 represents the only RMP located within the study area. A variety of historical and cartographic evidence combine to suggest that the building may have been razed in 1641/2 by the forces of the Earl of Ormond. The castle's occupant at that time was involved in the provisioning of Confederate troops besieging Drogheda late in 1641, and Ormond repaid such participation, in Fingal and parts of County Meath particularly, with targeted violence. The demise of the structure in the early 1640s is also implied by the discovery of reused dressed medieval stones in the original, mid-17th-century, vernacular cottage at Corballis House.

13.4.3.2. National Monuments

National monuments are broken into two categories; National Monuments in the ownership or guardianship of the state and National Monuments in the ownership or guardianship of a local authority. Section 8 of the National Monuments (Amendment) Act 1954 as amended provides for the publication of a list of monuments, the preservation, of which, are considered to be of national importance. Two months' notice must be given to the Minister for Housing, Local Government and Heritage where work is proposed to be carried out at, or in relation to, any National Monument.

There are no National Monuments incorporated by the study area.

13.4.3.3. Sites with Preservation Orders

The National Monuments Act 1930-2014, as amended provide for the making of Preservation Orders and Temporary Preservation Orders in respect of National Monuments. Under Section 8 of the National Monument Act 1930-2014, as amended the Minister for Housing, Local Government and Heritage, can place a Preservation Order on a monument if, in the Ministers' opinion, it is a National Monument in danger of being or is actually being destroyed, injured or removed or is falling into decay through neglect. The Preservation Order ensures that the monument shall be safeguarded from destruction, alteration, injury, or removal, by any person or persons without the written consent of the Minister.

There are no sites with preservation orders incorporated by the study area.

13.4.3.4. Protected Structures

The Dublin City Development Plan (2022-2028) and Fingal County Council Development Plan (2023-2029) was consulted for schedules of Protected Structures. These are buildings that a planning authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, and/or technical point of view. Protected Structures receive statutory protection from injury or demolition under Section 57 (1) of the Planning and Development Act 2000 (as amended). Protected structure status does not exclude development or alteration but requires the developer to consult with the relevant planning authority to ensure that elements which make the structure significant are not lost during development.

There are two Protected Structurse incorporated by the study area.

Table 13-9 - Protected Structures incorporated by the study area

CH Number	Type	Number	Townland
CH003	Church	RPS No.864	CORBALLIS
CH004	Airport Terminal	RPS No.612	COLLINSTOWN

13.4.3.5. Architectural Conservation Areas

The Dublin City Development Plan (2022-2028) and Fingal County Council Development Plan (2023-2029) was consulted for records relating to Architectural Conservation Areas (hereinafter 'ACAs'). The stated objective of ACAs is to conserve and enhance the special character of the area, including traditional building stock and material finishes, spaces, streetscapes, landscape and setting.

There are no areas listed as ACAs incorporated by the study area.

13.4.3.6. National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (hereinafter the 'NIAH') is a state initiative under the administration of the DHLGH and was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently, as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

There are three structures listed in the NIAH incorporated by the study area:

Table 13-10 - Structures listed in the NIAH incorporated by the study area

CH Number	Type	Number	Townland
CH002	House	11349002	CORBALLIS (Coolock By.)
CH003	Church	11349001	CORBALLIS (Coolock By.)
CH004	Airport Terminal	11349006	COLLINSTOWN

13.4.4. Undesignated cultural heritage sites

This section deals with sites that are considered to be of cultural heritage value but which do not fall within the above categories as they are not registered. Such sites may include lime kilns, dwellings / outhouses, trackways or townland boundaries etc. identifiable on the 1st edition 6-inch/25-inch OS maps. Aerial photography from the 1995, 2000, and 2005 fly-overs was inspected, as well as the latest OSI images, Google Earth and Bing Maps satellite imagery. In addition, publicly available LiDAR data published by TII and OPW was also consulted.

13.4.4.1. Undesignated cultural heritage sites that comprise extant remains

Undesignated cultural heritage sites which comprise extant remains are typically, though not always, post-1700 in date. The majority of these sites are represented on the 6" and/or 25" Ordnance Survey maps. Many constitute country houses and associated lodges, while others may be bridges or industrial features, hollow-ways, mass rocks etc.

There are no undesignated cultural heritage site that comprises extant remains within the study area.

13.4.4.2. Undesignated cultural heritage sites that do not comprise extant remains

Undesignated cultural heritage features which do comprise extant remains typically include features such as lime kilns, dwellings, outhouses, trackways, etc. which are identifiable on maps such as the 6" and / or 25" Ordnance Surveys but which no longer have an above-ground presence.

Table 13-11: Undesignated cultural heritage sites that do not comprise extant remains located within the study area.

CH Number	Type	Number	Townland
CH010	Laneway	UCH01	CORBALLIS (Coolock By.)

There is one undesignated cultural heritage sites that do not comprise extant remains located within the study area.

Townland boundaries

A townland is the smallest official land unit in the country. Ireland is made up of approximately 60,000 townlands. As a result, townland boundaries are ubiquitous in the Irish countryside, and have been incorporated into the modern agricultural landscape. Many townlands predate the arrival of the Anglo Normans, and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. This suggests that many the boundaries of many of these territorial units preserve landscape divisions from the medieval period and perhaps earlier. The townland names and boundaries were standardised in the nineteenth century when the Ordnance Survey began to produce large-scale maps of the country. Research into the name of these land units frequently provides information relating to its archaeology, history, folklore, ownership, topography or land use.

The proposed development site overlies one townland boundary.

Table 13-12: Townland boundaries intersected by the proposed development.

CH No	Location	Summary
CH009	Collinstown/Corballis	Shown as a roadway on the 1st ED OS sheet

13.4.5. Areas of archaeological potential.

Areas of archaeological potential (AAPs) are areas or locations whose landscape characteristics suggest a higher potential for unknown archaeological features to be present e.g. riverine, estuarian or peatland environments. There are no areas of archaeological potential within the proposed development site.

13.5. Likely Significant Effects of the Proposed Development

13.5.1. Construction Phase

Direct Effects: Most effects during construction phase are likely to be direct effects as a result of sub-surface disturbance or construction works. All effects at this phase which result in the demolition or alteration of a cultural heritage receptor are considered to be adverse and permanent. These are summarised in Table 13.13. In accordance with the EIA Directive as implemented through national legislation and regulations, avoidance of significant adverse effects through the preservation of Cultural Heritage Receptors where possible should be sought in the first instance, with an emphasis on preserving the more important receptors.

The proposed development site is located within an already developed and industrialised airport setting. The proposed development is located immediately adjacent to, and within the Zone of Notification of, CH001 (DU014-011----Unclassified Castle (site of)). Whilst the construction phase of the proposed development will not effect directly on the indicated location of this RMP, it is noted that this location is known only from historic mapping with limited accuracy. Furthermore, though the surrounding area comprises an industrialised airport setting, archaeological testing and monitoring of recent past developments in the vicinity of the current site (Dublin Airport Terminal 2 development - see 13.4.2) have uncovered sub-surface archaeological deposits, demonstrating the potential for the survival of sub-surface remains, even within the airport complex.

Table 13-13 - Summary of CH Sites subject to Direct Effects at Construction Phase

Proposed Development	Descriptor (and Townland)	Construction Phase Effects
The partial demolition, refurbishment and upgrade of the existing two-storey South Apron Support Centre (SASC)	(CH001) DU014-011----Unclassified Castle (site of)	Direct
Reconfiguration and expansion of the existing 2-storey US Customs and Border Protection (CBP) pre-clearance facility	(CH009) Collinstown/Corballis townland boundary - shown as a roadway on the 1st ED OS sheet	Direct
Reconfiguration and expansion of the existing 2-storey US Customs and Border Protection (CBP) pre-clearance facility	(CH010) A straight laneway marked on the 1st Ed 6-inch OS sheet approaching the site of a castle (unclassified) from the west. It forms part of the Corballis House Demesne at this time	Direct

Table 13-14 - Description of Effects to CH sites at Construction Phase

CH No	Summary	Description of Effect	Magnitude of Effect prior to implementation of mitigation measures	Baseline Value	Significance of Effect prior to implementation of mitigation measures
CH001	(CH001) DU014-011----Unclassified Castle (site of)	The partial demolition, refurbishment and upgrade of the existing two-storey South Apron Support Centre (SASC) resulting in potential ground-disturbance within the statutory zone of notification for this RMP. Potential direct impact to any subsurface remains given the uncertain location of the caslte which is known only from historic mapping.	Major	Very high	Slight
CH009	Collinstown/Corballis townland boundary	The proposed expansion of the existing 2-storey US Customs and Border Protection (CBP) pre-clearance facility resulting in potential ground-disturbance	Major	Medium/Low	Slight
CH010	A straight laneway marked on the 1st Ed 6-inch OS sheet approaching the site of a castle (unclassified) from the west.	The proposed expansion of the existing 2-storey US Customs and Border Protection (CBP) pre-clearance facility resulting in potential ground-disturbance	Major	Medium/Low	Slight

Indirect Effects: It is not proposed to consider any effects on setting for any sites either within the development site or the wider study area during the construction phase, as construction works constitute a short-term alteration to the landscape.

13.5.2. Operational Phase

In accordance with the EIA Directive as implemented through national legislation and regulations, avoidance of significant adverse effects through the preservation of Cultural Heritage Receptors where possible should be sought in the first instance, with an emphasis on preserving the more important receptors.

Direct Effects: Subject to the implementation of the appropriate archaeological mitigation during the construction phase, there will be no additional direct effects on archaeological, architectural or cultural heritage sites at operational phase. CH001, CH009, and CH010 have no current above surface expression. Any effects on these cultural heritage receptors would occur at the construction phase only.

Indirect Effects: Any potential indirect effects at operation stage would largely occur as a result of effects on the setting of site (notably visual effects) and on the integrity and character. The proposed development is located within an operational airport and screened from view by the surrounding airport buildings, with no potential for visual effects. As a result, no indirect effects or effects on setting have been identified at operational phase.

13.5.3. Do nothing

The 'do-nothing' scenario will have no effect on archaeological, architectural or cultural heritage. There are currently no threats to the cultural heritage receptors identified, and maintaining the present environment would have no impact on this situation.

13.5.4. Cumulative effects

Effects to archaeology and cultural heritage as a result of the proposed development are direct effects limited to its boundaries so any potential for cumulative effect is restricted to developments whose boundary overlap with the proposed development or with receptors that will be affected by the proposed development.

Cumulative effects in respect of known projects have been excluded on the basis that there is no overlap in boundary. The present development is to take place in an already developed and industrialised airport setting with a marginal increase in building footprint on the context of the Dublin airport complex. In addition to this, there is to be no increase in building height. Subject to the implementation of the appropriate archaeological mitigation measures during the construction phase of the development, no residual cumulative effects on archaeological, architectural and cultural heritage are predicted.

13.6. Mitigation and Monitoring measures

The mitigation strategies outlined in this section detail the techniques to be adopted to avoid, reduce or offset the effects that the proposed development may have on features of archaeological, architectural and / or cultural heritage within the study area during both the construction and operation phases of the proposed development.

The following proposed mitigation measures are subject to approval by the relevant planning authorities and the National Monuments Service of DHLGH.

The proposed development site comprises an existing airport terminal building and adjacent modern apron, and an existing former Flight Catering Building with associated parking and yard space. The western portion of the development site comprises parts of Dublin Airport Terminal 2, developed between 2008 and 2013. Archaeological monitoring undertaken during this development identified the base of a late post-medieval boundary ditch truncated by airport services. Given the proximity of the proposed development site (within the statutory zone of notification) to RMP DU014-011----, and the potential for archaeological deposits to remain *in situ*, despite later development, the following mitigation strategy will be implemented during the construction phase of the development.

- A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.

13.7. Residual Effects

Subject to the implementation of the appropriate archaeological mitigation measures during the construction phase of the development, no significant residual effects on archaeological, architectural and cultural heritage are predicted.

Table 13-13 - Residual Effects to CH sites once mitigation measures have been implemented

Ch. No	Phase	Effect Type	Mitigation Measures	Magnitude of Effect after implementation of mitigation measures	Significance of Effect after implementation of mitigation measures
CH 001	Construction	Direct	A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.	Moderate	Slight
CH 009	Construction	Direct	A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.	Moderate	Negligible
CH 010	Construction	Direct	A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.	Moderate	Negligible

14. Material Assets

14.1. Introduction

According to relevant EPA guidance (EPA, 2022) the following topics warrant consideration under material assets:

- Built Services;
- Roads and Traffic; and
- Waste Management.

Roads and traffic have been assessed separately as part of this EIAR. Refer to Chapter 10 – Traffic. Therefore, this chapter identifies describes and assesses the likely significant effects on material assets serving the proposed development specifically in relation to existing and proposed built services (i.e., foul sewerage, surface water drainage, water supply, gas, electricity, and telecommunications utilities), and waste management; both of which are assessed separately within this section.

14.2. Built Services

14.2.1. Assessment Methodology

The methodology used to prepare this section of the EIAR is in accordance with the EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*' (2022). The study area for assessment of built services is the redline boundary of the project sites as depicted in Figures 1-1 and 1-2. The following sources have been used to collate information on built services within the study area :

- South Apron CBP Extension Below Ground Services Combined, drawing ref: 60592409-ACM-00-XX-DR-BS-020023 (Aecom, 2023); and
- South Apron Support Centre Below Ground Services Combined drawing ref: D00001-DAA-ING-XX-XXX-DR-F-055-0000-EXTRACT CATERING 230321 (daa, 2023);

Surface water runoff, foul drainage discharge and water supply requirements have also been designed in accordance with the following guidelines / policies:

- Dublin Airport Drainage Policy;
- Greater Dublin Strategic Drainage Study (GDSDS, 2005) Volume 2 – New Developments; and,
- Uisce Éireann's Code of Practises and Technical Standards (IW-CDS-5030-03 & IW-TEC-800).

14.2.2. Receiving Environment

The proposed development is located entirely on land owned by daa, within Dublin Airport. Consultation with relevant bodies has been undertaken to determine existing utilities present within the study area. A combined set of all underground services in the general vicinity of the study area is presented in the planning drawings submitted to support this planning application.

14.2.2.1. Storm Water Drainage

Existing surface water drainage infrastructure is presented on the planning drawings submitted. Surface water run-off from the CBP and SASC project sites are currently attenuated, with existing petrol interceptors in place along the drainage system to remove potential residual contaminants from storm water run-off across these areas.

14.2.2.2. Foul Water Drainage

The Dublin Airport Local Area Plan states that Dublin airport lies within the catchment of the North Fringe Sewer with effluent treated at Ringsend Wastewater Treatment Plant (FCC, 2020). There is an existing foul water network along the northern and eastern boundaries of the CBP site and through the centre of the CBP site from the northern boundary to the south-eastern boundary and from the northern boundary to the southern boundary. The foul water network runs adjacent to the northern, eastern and southern boundary of the SASC site.

14.2.2.3. Water Supply & Distribution

Located within Ballycoolin Reservoir Supply Area, the current airport demand is met from an internal reservoir and boosting system that is controlled by daa (FCC, 2020). There is an existing potable water supply running east to west through the northern portion of the CBP site and running north to south in the western portion of the CBP site. A potable water supply runs adjacent to the western and southern boundaries of the SASC site.

14.2.2.4. ESB Supply

Dublin Airport is supplied by the Dardistown substation which has 2no. 40-megavolt amp transformers supplying 4no. Airport ring networks; Terminal 1, Terminal 2, campus, and the airfield (FCC, 2020). There are no overhead ESB lines running through the CBP site, however, there are 4no. daa 10kV underground lines running north to south through the CBP site. There is also a daa 10kV underground line running through the eastern most corner of the northern CBP site boundary. There are no overhead lines running through the SASC site, however a daa 10kV line enters the site in the lower section of the eastern boundary. Refer to the planning drawings submitted to support this planning application.

14.2.2.5. Gas Supply

The Airport is currently served by a 19-bar gas main (feeding a 315mm diameter 4-bar ring main within the Airport) from the Cloghran Ground Installation located on Swords Road (FCC, 2020). There are no existing gas utilities within the CBP site boundary. There are 2no. existing gas lines running along the western boundaries and southern boundaries of the SASC site. Refer to the planning drawings submitted to support this planning application.

14.2.2.6. eir Network

Dublin Airport is serviced by a mixture of copper and fibre networks served by 2no. public node operator points within the airport, operated by eir. There are a number of other telecom service providers, utilised by daa, who are granted access over eir's existing network within the airport. eir services enter the airport via the R132 Swords Road (FCC, 2020). There are 2no. communication lines running along the western and northern boundaries of the CBP site, with a third line running along the northern boundary. There are 2no. communication lines that enter the SASC site boundary, 1no. line at the northern boundary of the site and 1no. line on the eastern boundary.

14.2.2.7. Lighting

There are a significant number of existing lighting structures and associated cable ducting within the CBP site boundary. There is an underground services tunnel, carrying lighting and associated cable ducting, that enters the SASC site at the midpoint of the eastern boundary and 1no. line of lighting structures adjacent to the southern boundary of the site.

14.2.3. Impact Assessment

14.2.3.1. Characteristics of the proposed development

A detailed description of the proposed development is presented in Chapter 2 - Project Description. In order to identify, describe and assess the likely significant effects from the proposed development, the characteristics of the proposed built services / utilities are considered, as summarised below.

14.2.3.2. Surface Water / Storm Water Drainage

The existing 750mm diameter surface water network pipeline for the CBP site will be diverted and rerouted prior to foundation construction. Roof runoff from the proposed CBP building will be collected and conveyed by the diverted network pipeline and will be discharged to the existing 750mm pipeline at a location farther downstream. Slot drains will be constructed to collect the excess runoff along the 'head-of-stand' road, which runs inside the northern and eastern perimeter of the CBP site (i.e redline boundary of the proposed development). The construction of a section of 600mm clean-only surface water drainage pipeline will be put in place to future-proof for the potential future diversion of clean roof runoff to the Cuckoo Supply Channel, in a separate pipeline to the potential contaminated runoff from the adjacent paved area.

The clean-only surface water pipeline is inert and will form part of the future drainage network at Dublin Airport. This will avoid repeat construction at the CBP building in the future. The overall future drainage network, of which the clean-only surface water drainage pipeline will form part, will be the subject of a future planning application. Until then, it will, if permitted, serve no function unless and until the future drainage network receives planning permission.

The surface water network for the CBP site has been subject to hydraulic modelling, the results of which confirmed that the existing downstream network has sufficient hydraulic capacity to receive flows from the CBP drainage network (AECOM, 2023). The design of all surface water drainage collection and conveyance systems includes an uplift factor of 20% to all rainfall data/events (AECOM, 2023).

It is proposed to attenuate surface water flows for the SASC site and discharge the attenuated surface water run-off by gravity via a new 225mm diameter surface water outfall that will discharge into the existing 500mm diameter surface water sewer running in an easterly direction towards Corballis Park Road. .

14.2.3.3. Foul Drainage

The existing drainage system for the CBP site will be diverted and rerouted prior to foundation construction. For the SASC site, it is proposed to discharge the wastewater effluent from the proposed development by gravity via a new 225mm via a single point of connection to the existing network. All foul drainage related works will be carried out in consultation with Uisce Éireann and in accordance with all relevant Uisce Éireann guidelines and any Site-specific additional requirements.

14.2.3.4. Water Supply and Distribution

Existing water mains and hydrants within the CBP site will be diverted and rerouted prior to construction. It is proposed to service the proposed SASC development via a new 50mm diameter watermain connection off the existing 150mm diameter watermain that runs along a portion of the site boundary.

14.2.3.4.1. ESB

Prior to CBP foundation construction, existing low voltage power distribution will be diverted and rerouted. Prior to commencement of SASC construction, an internal substation will be demolished during the demolition phase.

Power supply, and the requirement for any alterations to the existing power supply network for the development of the subject Site, will be agreed with ESB Networks in advance of construction. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.

14.2.3.4.2. eir Network

There will be no telecommunication supply related works for the CBP site or SASC site.

14.2.3.4.3. Lighting

Diversion and rerouting of existing low voltage power distribution and light fittings will take place prior to CBP construction.

There will be no lighting supply related works for the SASC site.

14.2.3.5. Potential Effects during the Construction phase

The following potential impacts could occur during the Construction phase: -

- Damage to existing major foul water network, within the CBP or SASC site boundary;
- Damage to existing underground power supply which runs through the CBP site and around the SASC site;
- Potential power outages to existing services in the surrounding area during the diversion and rerouting of the supply networks within the CBP site; and,
- Contamination to the existing public water supply network during diversion and rerouting of the water supply network within the CBP site boundary.

Given the nature and scale of proposed development and the fact that a CEMP will be prepared and implemented by the contractor during construction and demolition these potential effects are considered to be unlikely and should they occur, would be temporary and moderate adverse in nature. There will be no likely significant effects regarding built services during construction.

14.2.3.6. Potential Effects during the Operational Phase

As previously stated, all power, telecommunications networks and lighting will be diverted and rerouted within the proposed development in accordance with the relevant service providers guidelines and requirements and standard best practice guidelines. There will be no likely significant effects regarding built services during the operational phase.

14.2.4. Do Nothing Effect

The Material Assets Assessment assumes that under the 'Do-Nothing' scenario the proposed scheme would not be developed. Thus, there would be a neutral effect on built assets within the vicinity of the proposed development. There will be no likely significant effects regarding built services under the 'Do-Nothing' scenario.

14.2.5. Cumulative Effects

Due to the nature and scale of the proposed development, no cumulative impacts are anticipated during the construction or operational phases of the proposed development associated with built services. There will be no likely significant effects regarding built services due to cumulative effects.

14.2.6. Proposed mitigation measures

14.2.6.1. Construction Phase

The following mitigation measures will be implemented during the construction phase;

- A Construction Environmental Management Plan (CEMP) has been prepared to support this planning application. Prior to the commencement of construction works the appointed contractor will alter, if necessary, in light of conditions which may be imposed on the permission, the CEMP further. This CEMP will take account of all of the environmental considerations (including water, dust and noise nuisance control; soil / stockpile management; temporary groundwater management; appropriate Site management of compound area; fuel, oil and chemical storage and use; and waste management) set out in the CEMP submitted as part of this planning application;
- Diversion and rerouting of the following services will take place prior to foundation construction; existing watermains and hydrants, existing drainage system, existing LV power distribution and light fittings, and existing fuel line;
- The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply;
- All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned;
- Connections to the existing and proposed foul networks will be coordinated with the relevant utility provider. All works associated with the existing utilities for the proposed development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, eir and Uisce Éireann), Health and Safety Authority and any additional site-specific requirements;
- A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the proposed development. The underground power lines and foul and water mains within the existing Uisce Éireann services, located onsite will be clearly marked and all Site personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; and,
- Local drainage will be surveyed and, where necessary, blocked off to prevent runoff of potentially contaminated surface water entering the surface water drainage system. A detailed Surface Water Management Plan will be included in the CEMP to be prepared by the Contractor, to deal with the treatment of surface water runoff prior to discharge to the site drainage system.

14.2.6.2. Operational Phase

No mitigation measures are required during the operational phase.

14.3. Waste Management

14.3.1. Assessment Methodology

This section of the EIAR has been prepared in accordance with the EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' (2022), 'and '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*' (EPA 2021).

This assessment has also been informed by findings of the Chapter 11 – Land, Soils and Geology section of this EIAR.

14.3.2. Receiving Environment

Based on a review of available historic mapping and aerial photography, historic land-use at the Site was greenfield before being developed as an airfield. The GSI bedrock geology 100k map identified the underlying bedrock of the site as the Tober Colleen Formation, comprised of calcareous shale, and limestone conglomerate. The Waulsortian Limestone Formation, comprised of massive, unbedded limestone, lies to the north of the site. Based on all available evidence, including soil analytical data and findings from the geotechnical investigation (as detailed in Chapter 11 – Land, Soils and Geology), and taking account of proposed mitigation measures, soils beneath the Site are not considered likely to have a significant effect on human health, building and services, or environmental receptors.

14.3.3. Impact Assessment

14.3.3.1. Characteristics of the proposed development

A detailed description of the proposed development is presented in Chapter 2 – Project Description. The following summary relates to the characteristics of the proposed development specifically in relation to waste management. The proposed development will be designed, planned, constructed and operated to minimise waste generation at every stage.

The management of waste generated during the construction of the proposed development will be in accordance with the CEMP submitted as part of this application. The scope of works for the project includes demolition of 2,561m^2 of the existing SASC footprint. The following waste streams will be generated during the construction and demolition phases: concrete, mechanical, electrical containment, wood, glass, aluminium, iron and steel, insulation material, construction material containing asbestos and, soils.

14.3.3.2. Potential Effects during Construction phase

During the construction phase, it has been estimated that the various waste streams will be generated and managed as follows (refer to the CEMP submitted as part of this application). Table 14-1 identifies the estimated volume of waste for each key stream that will be generated during the construction and demolition phase of the proposed development.

Table 14-1 - Estimated Volume of waste generation

Waste Stream	Estimated Volume (tonnes)
Soils	4,500
Concrete	120
Mechanical	25
Electrical Containment	10
Wood	3
Glass	0.3
Aluminium	1
Iron and Steel	5
Insulation Material	3
Construction Materials Containing Asbestos	5
Total Demolition Waste	4,672

It is estimated that approximately 50m^3 water will be used each month for general construction activities, excluding any water-intensive activities such as commissioning.

The waste management strategy during the construction phase of the proposed development has been developed in accordance with the waste management hierarchy and relevant EU and Irish policy. The overarching objectives of the Eastern-Midlands Region Waste Management Plan 2015-2021 have been incorporated into the latest development plans pertinent to this Site i.e., Fingal County Council Development Plan 2023 – 2029 and Dublin Airport Local Area Plan 2020. According to FCC (2023), the Regional Waste Management Plan has the following objectives:

- Prevent or minimise the production of waste in the first instance;

- Reduce, re-use and recycle to the maximum extent possible;
- Endeavour to recover energy from waste where possible; and
- Ensure the efficient and safe disposal of any residual waste.

The Fingal Development Plan 2023-2029 sets out the following objective with regards to construction and demolition waste management:

> *'CAP25 – Have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these Guidelines in order to ensure the consistent application of planning requirements.*

The Dublin Airport Local Area Plan 2020 sets out the following objectives with regards to waste management:

> *'WM01 – Support, where appropriate, the provision of proposals to aid the transition from a waste management economy to a green circular economy.*
>
> *WM02 – Promote a waste prevention and minimisation programme to target all aspects of waste in the LAP boundary area, focusing on all airport, commercial and domestic waste producers.'*

As with any construction project, there is potential for nuisance issues to arise during the construction phase, associated with dust or waste materials impacting roads and footpaths adjacent to the proposed development. Therefore, while waste will be generated during the construction of the proposed development, all waste streams will be managed in accordance with statutory waste management and environmental requirements, regional waste related policy, best practice waste management guidance, and a project specific Resource and Waste Management Plan (RWMP) which will be developed by the Contractor in advance of the commencement of construction or demolition works. The potential effects of waste generated during the construction phase (via. transport and disposal / recovery to appropriately permitted / licenced facilities; and potential nuisance issues) will be temporary and slight adverse in nature. Mitigation measures will be implemented as required to further manage these potential effects. There will be no likely significant effects associated with waste management during construction.

14.3.3.3. Potential Effects during Operational Phase

During the operational phase all waste materials will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All such waste will be transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Acts 1996 to 2011.

Therefore, while waste will be generated during the operational phase of the proposed development, all such waste will be managed in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance. The potential effects of waste generated during the operational phase (via. transport and disposal / recovery to appropriately permitted / licenced facilities;) will be long-term and imperceptible. There will be no likely significant effects associated with waste management during operation.

14.3.4. Cumulative Impacts

Based on the scale and nature of the proposed development, and given that a RWMP will be prepared and implemented for the construction phase, no cumulative effects are anticipated during the construction or operational phases of the proposed development associated with waste generation. There will be no likely significant effects associated with waste management and / or generation.

14.3.5. Proposed mitigation measures

14.3.5.1. Construction Phase

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

- All waste management procedures implemented onsite during the construction phase will be in accordance with the Outline CEMP submitted as part of this planning application, and a project specific RWMP to be prepared by the Contractor, in accordance with the '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*' (EPA 2021). The RWMP will take account of the relevant requirements of the Outline CEMP, the EIAR and any relevant planning conditions etc., and will be prepared by the Contractor in advance of the commencement of any construction or demolition works.
- Precondition surveys will be conducted including asbestos surveys (as required). All recommendations arising from these surveys will be completed in advance of the commencement of any demolition works.

- The contractor will supply all waste containers / skips, as required, for each of the identified waste streams. Waste will be segregated and removed to licensed facilities by licenced hauliers and all containers will be emptied before they are full to avoid overflowing. The contractor is to provide a waste forecast for waste types and quantities expected to be generated.
- Good working practices and take back schemes will be used to reduce the amount of waste generated, as an initial step, with waste management routes for each waste stream to be recorded in the site Waste Management Plan. There is a target of 98% diversion of construction waste from landfill to be achieved with a minimum diversion of 90%. In order to reduce waste generation as far as possible, off cuts, surplus materials and packaging is to be returned to suppliers for closed loop recycling, single used plastics are to be avoided where possible and all materials are to be stored correctly to avoid waste generation from damage and contamination of incorrectly stored materials.
- All waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. All waste will be removed from Site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the construction phase will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All waste removed offsite will be appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996 and 2001, as amended and all subsequent waste management regulations). All waste management and disposal / recovery records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (FCC, EPA) as required.
- Scheduling and planning the delivery of materials will be carried out on an '*as needed*' basis to limit any surplus materials;
- Materials will be ordered in sufficient dimensions so as to optimise the use of these materials onsite, and will be carefully handled and stored so as to limit the potential for any damage;
- Where feasible, sub-contractors will be responsible for the provision of any materials they require onsite in order to help reduce any surplus waste;
- All loaded trucks entering and exiting the Site will be appropriately secured and covered;
- Dust will be controlled at entry and exits to the Site using wheel washes (as required) and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel / road sweeper washings will be contained and treated prior to discharge;
- Secure lockable and controlled storage to be provided for the storage of chemicals and other hazardous materials, e.g., asbestos;
- The Contractor is to provide details of proposed measures to be implemented to mitigate against Foreign Object Debris (FOD) and windblown materials; and,
- All waste containers are to be enclosed and lockable to prevent FOD.

14.3.5.2. Operational Phase

Waste management during the operational phase of the development will be undertaken by private waste contractors (in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance), and regulated by Fingal County Council. Therefore, no further mitigation measures are required with regard to the transport and disposal or recovery of all waste streams which will be generated during the operational phase.

14.4. Residual Effects

Cumulative effects on built services and waste management have been considered between both project elements and with other proposed / committed future developments within the vicinity of the study area. Further details are provided in Chapter 17 – Future Airport Development, and Chapter 18 – Cumulative Effects. It has been determined that there will be no likely significant as a result of cumulative effects.

Taking account of the proposed mitigation measures for Material Assets, specifically built services the residual effects of the proposed development will be short-term and slight adverse during the construction phase, and long-term and not significant during the operational phase. There will be no likely significant residual effects associated with waste management and / or generation.

Taking account of the proposed mitigation measures for Material Assets, specifically waste management, the residual effects of the proposed development will be short-term and imperceptible during the construction phase, and long-term and imperceptible during the operational phase. There will be no likely significant residual effects associated with waste management and / or generation.

14.5. Do Nothing Scenario

The Material Assets Assessment assumes that under the 'Do-Nothing' scenario the proposed development would not be developed. Thus, the disposal of excavation and other construction waste associated with the Proposed Development would not occur. The do-nothing scenario will have a neutral and imperceptible effect on the Site with regards to Material Assets. There will be no likely significant residual effects associated with the 'Do Nothing' scenario.

14.6. Monitoring Requirements

The Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (FCC, EPA) as required.

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

15. Interactions

15.1. Introduction

This chapter describes interactions between impacts on different environmental factors. All potential interactions have been addressed as required throughout the EIAR. During the scoping, baseline assessment and impact assessment stages of this report, contributors (as set out in Chapter 1 of the EIAR) have liaised with each other where relevant to ensure that all such potential interactions have been assessed. A detailed description of the proposed development is presented in Chapter 2 – Project Description.

15.2. Summary of Interactions

The interactions between each of the topics as discussed within Chapter 4 to Chapter 14 of this EIAR have been considered in order to determine the potential direct and indirect environmental impacts, via various pathways, which could arise as a result of the proposed residential development. This section of the EIAR has been prepared in accordance with EPA 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022) which states the following;

> 'Some topics could be placed under more than one heading, for example where hydrogeology is a relevant topic it may be relevant under the heading of 'Aquatic Ecology' as well as under 'Water' or 'Ground Water.' Another example would be amenity which may be relevant under 'Population and Human Health' and 'Landscape'. The requirement for the EIAR to consider 'Interactions' addresses this issue by ensuring that effects are cross-referenced between topics, thus reducing the need to duplicate coverage of such topics.'

A summary matrix showing significant interaction and interdependencies between environmental attributes specifically in relation to the proposed development is presented in Table 15-1. Each environmental topic considered within this EIAR is further discussed below, in Section 15.3 (Population and Human Health) to Section 15.12 (Material Assets).

Table 15-1 – Summary Interactions Matrix

	Chapter 4 - Population & Human Health		Chapter 5 - Biodiversity		Chapter 6 - Landscape and Visual		Chapter 7 - Air Quality		Chapter 8 – Climate		Chapter 9 - Noise & Vibration		Chapter 10 - Traffic		Chapter 11 - Land, Soils & Geology		Chapter 12 - Water		Chapter 13 - Cultural Heritage		Chapter 14 - Material Assets	
	Con.	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***	***Con.***	***Op.***
Chapter 4 - Population & Human Health			×	×	×	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	×	×	×	×
Chapter 5 - Biodiversity	×	×			×	×	✓	✓	✓	✓	×	×	×	×	×	×	✓	✓	×	×	×	×
Chapter 6 - Landscape & Visual	×	×	×	×			×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Chapter 7 - Air Quality	✓	✓	×	×	×	×			✓	✓	×	×	✓	✓	✓	✓	×	×	×	×	×	×
Chapter 8 – Climate	×	×	×	×	×	×	×	×			×	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓
Chapter 9 - Noise & Vibration	✓	✓	×	×	×	×	×	×	×	×			×	×	×	×	×	×	×	×	×	×
Chapter 10 - Traffic	×	×	×	×	×	×	✓	✓	✓	✓	✓	✓			×	×	×	×	×	×	×	×
Chapter 11 - Land, Soils & Geology	✓	✓	×	×	×	×	✓	✓	✓	✓	×	×	×	×			✓	✓	×	×	✓	✓
Chapter 12 - Water	✓	✓	✓	✓	×	×	×	×	×	×	×	×	×	×	✓	✓			×	×	×	×
Chapter 13 - Cultural Heritage	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			×	×
Chapter 14 - Material Assets	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×	✓	✓	✓	✓	×	×		

15.3. Population & Human Health

Population and human health attributes interact with other environmental attributes as outlined in Chapter 4 of this EIAR and summarised as follows:

- **Air Quality & Climate** - Potential impacts on the receiving air quality and climate environment could also result in associated human health impacts. However, the mitigation measures referenced in Chapter 4 – Population and Human Health, and those relevant in Chapter 7 – Air Quality & Chapter 8 – Climate, once in place, will result in no potential for impact when these topics do interact.
- **Noise & Vibration** - Potential impacts on the receiving noise and vibration environment could also result in associated human health impacts. However, the mitigation measures referred to in Chapter 4 – Population and Human Health, and those relevant in Chapter 9 – Noise and Vibration, once in place, will result in no potential for impact when these topics do interact.
- **Land, Soils & Geology** - Potential impacts on the receiving land, soils and geology environment could also result in associated human health impacts. However, the mitigation measures referenced in Chapter 4 – Population and Human Health, and those relevant in Chapter 11 – Land, Soils and Geology, once in place, will result in no potential for impact when these topics do interact.
- **Water** - Potential impacts on the receiving water environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 4 – Population and Human Health, and those relevant in Chapter 12 – Water, once in place, will result in no potential for impact when these topics do interact.

15.4. Biodiversity

Biodiversity attributes interact with other environmental attributes as outlined in Chapter 5 of this EIAR and summarised as follows:

- **Air Quality & Climate** - Potential impacts on the receiving air quality environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 7 – Air Quality and Chapter 8 – Climate, once in place, will result in no potential for impact when these topics do interact.
- **Water** – Potential impacts on the receiving hydrology and hydrogeology environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 10 – Water, once in place, will result in no potential for impact when these topics do interact.

15.5. Landscape and Visual

Refer to Chapter 5 - Biodiversity for further information on the effects of the development on vegetation.

15.6. Air Quality

- **Population and Human Health** - 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 impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is negative, direct, short-term, localised and imperceptible in the construction stage and long-term, direct, negative and imperceptible with respect to population and human health in the operational phase.
- **Climate** – Generally Air Quality impacts are linked to climate impacts. However, the mitigation measures described Chapter 7 – Air Quality and Chapter 8 - Climate will ensure that any potential impacts are minimised.
- **Traffic** - Interactions between air quality and traffic can be significant. With increased access to the site, comes 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. None of the road links impacted by the

proposed development satisfy the TII criteria for a detailed air quality assessment. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

- **Land, Soils and Geology -** Construction phase activities such as stockpiling materials and movement 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. No other significant interactions with air quality and climate have been identified.

15.7. Climate

Climate attributes interact with other environmental attributes as outlined in Chapter 8 of this EIAR.

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and will contain the 1 in 100-year event plus 20% climate change allowance.

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling.

The risk to building design in terms of material vulnerability to climate change, specifically extreme heat and cold, has been considered. Building design will also take into account energy efficiency measures to reduce operational carbon emissions.

15.8. Noise and Vibration

In compiling the impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and traffic flow projections associated with the development provided by the traffic consultants.

- **Population and Human Health –** There is an interaction with Human Health, which has informed Chapter 4 - Population and Human Health of this EIAR.
- **Traffic -** Interactions between noise quality and traffic can be significant. With increased access to the site, comes increased traffic movements and increased noise levels. However given the likely traffic volumes during the construction stage in this assessment, the impact of the interactions between traffic and noise quality are considered to be imperceptible

15.9. Traffic

All interactions with traffic during both Construction and Operational Phases have been identified in the relevant Chapters and where appropriate, mitigation measures have been applied. The following provides a summary of the identified interactions:-

- **Air Quality and Climate** - During the construction stage, on-site construction works will contribute to a temporary decrease in air quality. In the development operational stage traffic generation associated with the development will contribute to increased traffic volumes on the surrounding network which in turn will decrease air quality. Further details in relation to direct impacts are addressed in Chapter 7 – Air Quality and Chapter 8 - Climate.
- **Noise and Vibration** - During the construction stage, development of the Site will result in a short-term increase of construction traffic. Further details in relation to direct impacts and mitigation are addressed in Chapter 9 – Noise and Vibration.

15.10. Land, Soils and Geology

- **Potential human health** risks associated with quality impacts to soils arising from the proposed development during the Construction Phase have been identified as follows;
  - Potential risk to receptors (i.e., construction workers) through direct contact, ingestion or inhalation with any soils which may potentially contain hydrocarbon concentrations from Site activities (potential minor leaks and spills of fuels, oils and paint). However, this risk will be addressed by implementation of the mitigation measures outlined fully in Chapter 11 – Land, Soils and Geology.

- Taking account of the baseline environmental setting and the proposed mitigation measures during the Construction Phase, minimal human health risks associated with exposure to contaminants (via. direct contact, ingestion or inhalation) resulting from the proposed development are anticipated.

- **Air Quality & Climate** - Potential impacts on the receiving Land, Soils and Geology environment could also impact on air quality conditions present. However, the mitigation measures described in Chapter 11 – Land, Soils & Geology, and those relevant in Chapter 7 - Air Quality and Chapter 8 – Climate, once in place, will result in no potential for impact when these topics do interact.
- **Water** - Potential impacts on the receiving land, soils and geology environment could also impact on hydrology and hydrogeology conditions present. However, the mitigation measures described in Chapter 12 – Water, and those relevant in Chapter 11 – Land, Soils & Geology, once in place, will result in no potential for impact when these topics do interact.
- **Material Assets** – Resource and waste minimisation and management play a key role in minimising Land Soils and geology impacts. Mitigation measures described in Chapter 8 – Climate, and those relevant in Chapter 14 – Material Assets, once in place, will result in no potential for impact when these topics do interact.

15.11. Water

Water attributes interact with other environmental attributes are summarised as follows: -

- **Population & Human Health** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on human health. However, the mitigation measures described in Chapter 12 – Water, and those relevant in Chapter 4 – Population and Human Health, once in place, will result in no potential for impact when these topics do interact.
- **Biodiversity** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on biodiversity conditions present, due to indirect connectivity. However, the mitigation measures described in Chapter 12 – Water, and those relevant in Chapter 5 – Biodiversity will ensure that this will not occur.
- **Land, Soils & Geology** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on land, soils and geology conditions present. However, the mitigation measures described in Chapter 12 – Water, and those relevant in Chapter 11 – Land, Soils and Geology will ensure that this will not occur.

15.12. Cultural Heritage

The authors of the Cultural Heritage chapter compiled preliminary constraint reports on the known archaeological and architectural heritage assets within the study area at the outset of the project to inform the design team of their location, extent and designations in order to ensure that they were factored into the development design at an early stage and to assist in considerations of potential interactions with other environmental attributes. While a number of archaeological investigations have concluded that the current industrialised setting, the proposed development boundary is located immediately adjacent to, and within the Zone of Notification of, an RMP (CH001 (DU014-011----Unclassified Castle (site of)), but the indicated location of this RMP is only known from historic mapping with limited accuracy. In addition, archaeological testing and monitoring of recent past developments in the vicinity of the current site (Dublin Airport Terminal 2 development - see 13.4.2) have uncovered sub-surface archaeological deposits, demonstrating the potential for the survival of sub-surface remains, even within the airport complex. There are no impacts on Cultural Heritage at the operational phase. The authors also liaised with the design team in relation to incorporating its alignment as part of the design of the proposed development.

15.13. Material Assets

Traffic is one of the environmental attributes typically assessed under Material Assets. For the purposes of this EIAR a full Traffic Impact Assessment has been undertaken and is presented in Chapter 10 – Traffic, along with all relevant mitigation measures.

Material Assets attributes interact with other environmental attributes as outlined in Chapter 14 of this EIAR and summarised as follows: -

- **Land, Soils and Geology** – Potential impacts could arise from waste soils / materials generated during the proposed development. However, the mitigation measures described in Chapter 14 – Material Assets, and those relevant in Chapter 11 – Land, Soils and Geology, once in place, will result in no potential for impact when these topics do interact.

- **Water** – Potential impacts from the development may affect the existing major foul water network and existing public water supply network during the rerouting of the water network within the CBP boundary. This impact is considered unlikely, but, if occurred, would be temporary and moderately adverse. Mitigation measures described in Chapter 12 – Water, once in place, will result in no potential for impact when these topics do interact.
- **Climate** – Resource and waste minimisation and management play a key role in minimising climate related impacts. Mitigation measures described in Chapter 14 – Material Assets, and those relevant in Chapter 8 – Climate, once in place, will result in no potential for impact when these topics do interact.

16. Schedule of Environmental Commitments

All mitigation and monitoring commitments detailed within this EIAR have been included in a separate compendium and are presented in Table 16-1 and 16-2 below. Together these tables form the Schedule of Environmental Commitments which will be implemented as required during the construction and operational phases of the proposed development at Dublin Airport. In addition, the following reinstatement commitments must be fully implemented upon completion of the construction phase:

- All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings;
- All construction waste and / or scrapped building materials are to be removed from the Site on completion of the construction phase;
- Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase; and,
- Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

All of the mitigation and monitoring commitments detailed below have been incorporated into the Outline Construction Environmental Management Plan (CEMP) submitted as part of this planning application; this is a live document which will be further added to in the Detailed CEMP prepared by the Contractor and will include any future additional mitigation measures as may be required.

Table 16-1 - Schedule of Environmental Commitments – Mitigation Measures (Construction and Operational Phases)

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 4 – Population and Human Health	The proposed development will have minor adverse effects during the construction phase of the proposed development on population and human health as stated above in Table 4-3. However mitigation measures as presented within the relevant technical chapters (Chapter 7 - Air Quality; Chapter 8 – Climate; Chapter 9 – Noise and Vibration; Chapter 11 – Land, Soils and Geology; and Chapter 12 – Water) and Chapter 16 - Schedule of Commitments, will be implemented as part of the proposed development.		
Chapter 5 – Biodiversity	Construction phase ecological mitigation measures shall be developed and undertaken in relation to sensitive receptors (e.g. the Cuckoo Stream) in close proximity to the proposed development site. **Protection of Sites Designated for Nature Conservation** Protection of sites designated for conservation, and the features of interests associated with designated sites, is through prevention of potential impacts to the aquatic environment during the construction phase. Mitigation measures as set out in Chapter 11 – Land, Soils and Geology; and Chapter 12 – Water will be implemented during the Construction phase, ensuring water quality of the Cuckoo Stream is not negatively affected during the construction phase of the proposed development. These mitigation measures will ensure that surface water run-off quality is appropriately treated and ensured before it discharges to the stream. Works will follow best practice guidance as outlined in Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). **Prevention of pollution to surface waters** Mitigation measures as set out in Chapter 11 – Land, Soils and Geology; and Chapter 12 – Water will be implemented during the Construction phase. Works will follow best practice guidance as outlined in Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016) to prevent water pollution. The following measures for the protection of the Cuckoo Stream are outlined in the CEMP for the SASC and CBP: • No discharge to existing infrastructure/watercourses/ground are permitted to take place without the appropriate consents or approvals. • The Contractor will identify, and risk assess existing drainage systems and put in place measures to prevent possible contamination from surface run-off emanating from the works. • All plant and equipment brought to site is to be in good working order with no leaks and maintained as such during the course of the Works.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 5 – Biodiversity	• Fuelling of plant and equipment is to be carried out within compound and material storage areas only (unless agreed otherwise with the Client – may be necessary in the case of mobile task lighting or generators) by a trained operative using double skinned bowsers with a designated fuelling area and bunded fuel storage. • Drip trays to be used during all fuelling operations and a fully maintained spill kit located within the designated fuelling area. • All fuels, chemicals or liquids will be stored in a lockable cabinet that will be located within a bunded area. • The Contractor is to comply with all national laws and regulations controlling pollution of the environment. Necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials will be taken. • Ditches and water streams will be clearly identified on site and shown on method statements and site plans. • Storage of materials will be located at least 4 metres away from water bodies, within designated and bunded areas. • All discharged water from pumping will be treated and tested as required to prevent any pollutants entering groundwater. Such water will be disposed of as construction site run off having first passed through a settlement tank or filtration system where appropriate. **Invasive species prevention** No legally restricted invasive species, such as Japanese knotweed, have been recorded within the proposed development site. Strict bio-security protocols will be implemented during the construction phase so as to ensure no imported materials potentially contaminated with invasive plant species are brought to site. **Additional Construction Phase Ecological Mitigation Measures** With regard to potential impacts on ecological features the following mitigation measures are proposed: • The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice On-site Guide (CIRIA, 2018 revised with errata 2019, 2020); • The construction management of the site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides 'Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice' to minimise as far as possible the risk of pollution; • The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the Cuckoo Stream from construction activities. The mitigation measures for prevention of potential surface water impacts as detailed in Chapter 12 - Water shall be implemented;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 5 – Biodiversity	• The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the Cuckoo Stream via the local groundwater body. All groundwater mitigation measures as outlined in Chapter 12 - Water shall be implemented; and, • The Contractor shall take all necessary precautions to prevent potential impact upon habitats and species from dust generated during the construction phase. All air quality mitigation measures as outlined in Chapter 7**Error! Reference source not found.**- Air Quality & Chapter 8 Climate shall be implemented. The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further added to by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.		
	Surface Water Drainage With regard to groundwater and surface water quality effects the following mitigation measures which are mentioned in Chapter 12 are proposed; • All of the mitigation measures (for the protection of soils and geology) listed in Chapter 11-Land Soil and Geology will be implemented onsite during the Detailed Design Stage and Construction. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented. • All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and, • A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 5 - Biodiversity	**Foul Disposal** Foul water from the proposed development will discharge to the existing foul sewer network. Foul water from the proposed development will be discharged to Ringsend WwTP.		
Chapter 6 – Landscape and Visual	There would be no significant landscape and visual effects as a result the proposed development. Therefore no further mitigation measures are recommended to avoid, reduce or offset significant effects.		
Chapter 7 – Air Quality	The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following mitigation measures have been recommended by drawing on best practice guidance from Ireland, 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 Construction Environmental Management Plan (CEMP) prepared for the site. ***Site Management*** The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies. At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 7-1 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors. Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions: • The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust effects and nuisance are minimised; • During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 7 – Air Quality	• 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; • 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; • It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein; • At all times, the procedures put in place will be strictly monitored and assessed. The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below. ***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. • Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping. **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.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 7 – Air Quality	• Impose and signpost a maximum-speed-limit of 20 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, where appropriate). **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 Demolition** • Prior to demolition blocks should be soft striped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). • During the demolition process, water suppression should be used, preferably with a hand-held spray. Only the use of cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used. • Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed. **Measures Specific to Earthworks** • Re-vegetate earthworks and exposed areas/soil stockpiles to inimizat surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once. • During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 7 – Air Quality	**Measures Specific to Construction** • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. **Measures Specific to Trackout** Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002). • A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles. • Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used. • 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 (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10 m from receptors where possible.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 7 – Air Quality			
Chapter 8 – Climate	During the construction phase vehicles, generators etc., will give rise to some GHG emissions, however the proposed development's effect on climate due to traffic can be minimised through mitigation measures. The following mitigation measures will be put in place to minimise emissions: • Implement a policy which prevents idling of vehicles both on and off-site including HGV holding sites; • Construction Phase traffic shall be monitored to ensure construction vehicles are using the designated haul routes; • All plant and machinery will be maintained and serviced regularly; • Efficient scheduling of deliveries will be undertaken to minimise emissions; and • Construction vehicles shall conform to the latest EU emissions standards and where reasonably practicable, their emissions should meet upcoming standards prior to the legal requirement date for the new standard. This will ensure emissions on haul routes are minimised.		
Chapter 9 – Noise and Vibration	Construction Noise Mitigation **Communication with Neighbours** The Contractor will be proactive in engaging with the occupants of neighbouring properties with potential for construction impacts and will be obliged to notify them of any works forecast to generate appreciable levels of noise, explaining the nature and duration of the works. A designated noise liaison will be appointed by the contractor for the duration of the construction works. This person should log any issues and follow up promptly. **Noise Control Audits** It is recommended that noise control audits be conducted at regular intervals throughout the construction programme. The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions. To this end, consideration should be given to issues such as the following (note that this list is not intended to be exhaustive): • Hours of operation being correctly observed; • Opportunities for noise control "at source"; • Optimum siting of plant items; • Plant items being stopped when not in use;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 9 – Noise and Vibration	• Correct use of proprietary noise control measures; • Materials handling; • Poor maintenance, and; • Correct use of screening provided and opportunities for provision of additional screening. **Selection of Quiet Plant** Careful consideration will be given to the noise emission levels of plant items when they are being considered for use on the site. This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative. **Control of Noise Sources** If the use of low noise plant or replacing a noisy item of plant are not viable or practicable options, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods, often in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures that could be moved around site as necessary may also be used to screen operatives using hand tools such as angle grinders. In practice, a balance may need to be struck between the use of all available techniques and the resulting costs of doing so. It is therefore proposed to adopt the concept of "Best Available Techniques" (BAT). BAT is defined as follows in Directive 2010/75/EU: *'"...the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole."* In this context "best" means "the most effective in achieving a high general level of protection of the environment as a whole".		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 9 – Noise and Vibration	The expression "available techniques" means "those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator". The term "techniques" includes "includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned". In specifying or otherwise determining BAT, consideration should be given to a specified list of considerations and also to "the likely costs and advantages of measures" as well as "the principles of precaution and prevention". Thus, the concept of BAT requires a degree of balance between the attainment of environmental benefits and the likely cost implications. In the identification of BAT, regard should be had to a wide range of factors, however, emphasis should be given to "practical suitability" and the need "to reduce an emission and its impact on the environment as a whole". Proposed techniques should also be evaluated in light of their potential effect on occupational health and safety. BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are relevant and hence are reproduced below. These recommendations should be implemented on the site. *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.* *Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.* *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.* *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.* *Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.* *Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."*		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 9 – Noise and Vibration	The following outline guidance in relation to specific plant will also be considered: • For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling. • For percussive tools such as pneumatic concrete breakers, rock drills and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. • For all materials handling ensure that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. • For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. • Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary. • All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. • Where practicable, metal on metal or rock on metal impacts should be avoided during night works. This can be achieved through the use of rubber mallets or impact linings etc. on site. • White noise reverse alarms should be utilised on vehicles where practicable to reduce potential annoyance of tonal noise emissions from site, particularly during the more sensitive evening and night periods. **Screening** The use of screens can be effective in reducing the noise level at a receiver location and should be employed as a complementary measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. The height and length of any screen should, where practicable, be such that there is no direct line of sight between the source and the receiver. BS5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the screen should be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the barrier rather than the transmission through the barrier itself. Screens constructed of materials with a surface mass greater than 10 kg/m typically offer adequate sound insulation performance.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 9 – Noise and Vibration	Wherever practicable, at static sites, a 2.4 m site hoarding is installed at the perimeter of the site to screen line of sight from receptor to the source of the noise. Where construction works are more fluid and locations are not fixed, an effort should be made where practicable to use demountable screens to surround the site works to provide an element of screening to the surrounding receptors. Annex B of BS5228 (Figures B1, B2 and B3) provides typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials. BS5228 Figure B2 is included here for information purposes.		

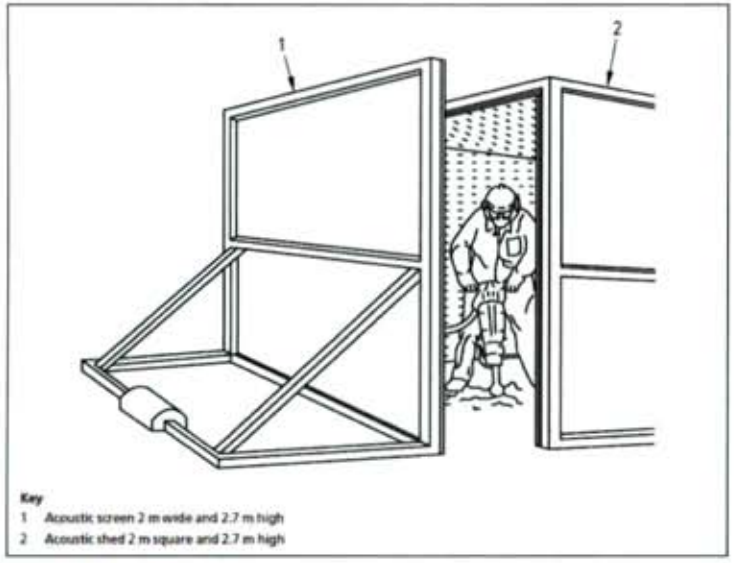


Table B.4 **Measured sound reduction given by types of partial enclosure**

Type of enclosure (see Figure B.3)	Reduction dB(A)		
	Facing the opening(s)	Sideways	Facing rear of shed
Open-sided shed lined with absorbent material; no screen	1	9	14
Open-sided shed lined with absorbent material; with reflecting screen in front	10	6	8
Open-sided shed lined with absorbent material; with absorbent screen in front	10	10	10

Figure 9.4 Typical acoustic screen/shed detail

<table>
<tr><th>Environmental Topic</th><th>Schedule of Environmental Commitments – Mitigation Measures</th><th>Construction Phase</th><th>Operational Phase</th></tr>
<tr><td rowspan="2">Chapter 9 – Noise and Vibration</td><td>Construction Vibration Mitigation
Non percussive demolition methods are to be employed where practicable. Vibration from construction activities will be limited to the values set out in Section 9.3.2 to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values set out in Section 9.3.2.</td><td></td><td></td></tr>
<tr><td>Façade Sound Insulation Performance
To achieve appropriate intrusive noise level, the elements of the façade will need to offer a minimum level of sound insulation performance as summarized in Table 9-15.

Table 9-15 – Minimum Sound Reduction Indices for Façade Elements (R, dB)
<table>
<tr><th rowspan="2">Element</th><th colspan="6">Octave Band Centre Frequency (Hz)</th><th rowspan="2">R_w</th></tr>
<tr><th>125</th><th>250</th><th>500</th><th>1k</th><th>2k</th><th>4k</th></tr>
<tr><td>Glazed Elements</td><td>30</td><td>26</td><td>34</td><td>42</td><td>40</td><td>50</td><td>37</td></tr>
<tr><td>Cladding Elements</td><td>29</td><td>41</td><td>48</td><td>53</td><td>48</td><td>47</td><td>48</td></tr>
</table>
For the glazed elements this level of performance can be achieved using an appropriately selected high performance double glazed system. For illustrative purposes the specification is based on the following glass build-up,
8mm glass – 18mm cavity – 8mm toughened glass
Selecting the façade to provide the sound insulation values listed above will ensure that the internal ambient noise design goals discussed in Section 9.3.3.2 will be achieved. Note that this specification is indicative and will be confirmed at the detailed design stage to ensure that the internal criteria will be achieved, there are other combinations of glazing build-ups and façade designs that may also meet the internal noise criteria.</td><td></td><td></td></tr>
<tr><td>Chapter 10 – Traffic</td><td>Construction Routes
It is recommended that construction traffic access be facilitated using the following routes:
• via Old Airport Road/R132-Swords Road Junction and Corballis Road South, or
• via Airport Roundabout, R132-Swords Road and Corballis Road South</td><td></td><td></td></tr>
</table>

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 10 – Traffic	**Environmental Control Measures** There is the potential that construction debris, particularly from site clearance, soil removal and dirty water run off may have an effect on footpaths and roads adjoining a construction site. In order to mitigate against this risk, the contractor is to monitor footpaths and road pavement surfaces throughout the project duration. Further to this a Construction Environmental Management Plan (CEMP) will be developed by the contractor, which will include control measures for construction debris, prior to the commencement of the work on the proposed development site. **Hours of Operation** Working hours on the Dublin Airport campus will take place 24/7. Work will be carried out on day shifts as far as possible however a considerable part of the works is expected to be undertaken during night shifts to minimise disruption to airport operations. Sunday, Public holidays and night shift working are subject to acceptance in advance by the daa Project Owner. A Noise Management plan will be required for all night works including plant details and scheduling of works. Contractors shall also abide by the Organisation of Working Act Time in relation to working hours. Mitigation Measures Maintaining the safety of the general public is a priority. With a series of robust controls, proactive measures and development of a detailed Traffic Management Plan, the risk of this key interface can be mitigated. The following measures will be adopted around the perimeter of the project for security and protection purposes: • All site access will be well lit, clean, robust level hard-standings, well signed and controlled by experienced gatemen. Doors and gates will be closed at all times when not providing access. • The traffic management team will be clean and well presented at all times. The contractors detailed Traffic Management Plan will address the following key issues: • Maintaining free traffic flow along the local road networks. • Ensuring all footpaths and road surfaces are always free from debris. • Ensuring the efficient free flow of operatives entering and exiting the proposed development site. • Managing the distribution flow of materials within the building and debris removal to maintain the required levels of productivity whilst achieving the high-quality standards expected. • Plant and operative segregation during all stages of the proposed development. • Robust traffic management principles and practices will need to be enforced to ensure construction traffic does not create congestion and cause inconvenience to the adjacent tenants and the public.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 10 – Traffic	• Accommodating the welfare of circa 120 construction personnel at the peak of construction activity. • Protection to the public for the duration of the project construction phase on all elevations. All deliveries will be through Corballis Park to Security Gatepost 9 for aggregates and concrete, and Gatepost 4 for other building materials such as steel, cladding, glazing and roofing. The contractor will develop a detailed Logistics Plan to identify the delivery schedule requirements for every delivery. Where necessary the deliveries will be held in a pre-screening area in the SASC compound prior to accessing the site through the Gatepost 9, and Gatepost 4. It is anticipated that the contractor will operate a "Just in Time" delivery philosophy to minimise materials stored on site and reduce congestion in and around the works compound.		
Chapter 11 – Land, Soils and Geology	Stripping of hardstanding, made ground, and subsoil will be carried out in a controlled and carefully managed way, coordinated with the proposed staging for the development, and will be removed from Site as soon as possible. This material (ca. 2,500m^3) will be removed for offsite disposal to a suitably licenced / permitted waste facility. The Contractor, in consultation with the Client and the Engineer, will be responsible for removing and replacing with suitable material as required. The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. All waste soils (including made ground) will be classified in accordance with the EPA Guidance Document '*Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation. It will be the Contractors responsibility to ensure that a project specific Detailed Resource and Waste Management Plan (developed in accordance with relevant 2021 EPA Guidance) is fully implemented onsite for the duration of the project. Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 12 - Water are also applicable to the protection of soils and geology during the construction phase:		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 11 – Land, Soils and Geology	• Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development; • The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site; • Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods; • All excavated materials will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m; • A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site; • The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001) which are also detailed in Chapter 12 – Water; and, • Specifically, regarding pollution control measures, the following will be adhered to; - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice; - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling; - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of; - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area; - All machinery will be serviced before being mobilised to Site; - Refuelling will be completed in a controlled manner using drip trays at all times; - Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water; - Ancillary equipment such as hoses and pipes will be contained within the bund;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 11 – Land, Soils and Geology	- Taps, nozzles or valves will be fitted with a lock system; - Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage; - Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills; - Only designated trained operators will be authorised to refuel plant on Site; - Procedures and contingency plans will be set up to deal with emergency accidents or spills; - An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment; - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and, - The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively. The above mitigation measures will be incorporated (as required) during Detailed Design Stage and form part of the Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works). The CEMP submitted as part of this application may be altered, if necessary, in light of conditions which may be imposed on the planning permission.		
	No mitigation measures will be required during the operational phase.		
Chapter 12 – Water	With regard to groundwater and surface water quality effects the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented: • The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines '*Control of water pollution from construction sites. Guidance for consultants and contractors (C532)*' and '*Groundwater control: design and practice (second edition) (C750)*' and CIRIA 2015 '*Environmental good practice on site guide (fourth edition) (C741)*' to minimise as far as possible the risk of pollution. • All of the mitigation measures (for the protection of soils and geology) listed in Chapter 11 will be implemented onsite during the construction phase.		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 12 – Water	• The Contractor will be responsible for ensuring that the existing drainage network will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required). • In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented: - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice; - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling; • A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation; - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area. - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity. - All oil stored on Site for construction vehicles will be kept in a locked and bunded area; - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination; - All Site vehicles used will be refuelled in bunded areas; - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and, - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes. • In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site; - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed perched water or the Cuckoo stream;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 12 – Water	- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed; - Any spillages will be cleaned up and disposed of correctly; - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening; - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete; - Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and, - Surplus concrete will be returned to batch plant after completion of a pour. • Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations. • In the unlikely event that ground contamination is encountered beneath the site during the construction works, all works will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance '*Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites*' (EPA, 2013) and UK Environment Agency Guidance *'Land contamination risk management (LCRM)'* (UK EA, 2021). The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.		
	With regard to groundwater and surface water quality effects the following mitigation measures are proposed; • All of the mitigation measures (for the protection of soils and geology) listed in Chapter 11-Land Soil and Geology will be implemented onsite during the Detailed Design Stage and Construction. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented. • All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 12 – Water	will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented; • In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and, • A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.		
Chapter 13 – Cultural Heritage	The mitigation strategies outlined in this section detail the techniques to be adopted to avoid, reduce or offset the effects that the proposed development may have on features of archaeological, architectural and / or cultural heritage within the study area during both the construction and operation phases of the proposed development. The following proposed mitigation measures are subject to approval by the relevant planning authorities and the National Monuments Service of DHLGH. The proposed development site comprises an existing airport terminal building and adjacent modern apron, and an existing former Flight Catering Building with associated parking and yard space. The western portion of the development site comprises parts of Dublin Airport Terminal 2, developed between 2008 and 2013. Archaeological monitoring undertaken during this development identified the base of a late post-medieval boundary ditch truncated by airport services. Given the proximity of the proposed development site (within the statutory zone of notification) to RMP DU014-011----, and the potential for archaeological deposits to remain *in situ*, despite later development, the following mitigation strategy will be implemented during the construction phase of the development. • A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.		
Chapter 14 – Material Assets	**Built Services** The following mitigation measures will be implemented during the construction phase; • An Outline Construction Environmental Management Plan (CEMP) has been prepared to support this planning application. Prior to the commencement of construction works the appointed contractor will develop this CEMP further into a detailed Construction Environmental Management Plan (CEMP) and will include for measures		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 14 – Material Assets	required to adhere to any planning conditions, as required. This CEMP will take account of all of the environmental considerations (including water, dust and noise nuisance control; soil / stockpile management; temporary groundwater management; appropriate Site management of compound area; fuel, oil and chemical storage and use; and waste management) set out in the Outline CEMP submitted as part of this planning application; • Diversion and rerouting of the following services will take place prior to foundation construction; existing watermains and hydrants, existing drainage system, existing LV power distribution and light fittings, and existing fuel line; • The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply; • All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned; • Connections to the existing and proposed foul networks will be coordinated with the relevant utility provider. All works associated with the existing utilities for the proposed development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, eir and Uisce Éireann), Health and Safety Authority and any additional site-specific requirements; • A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the proposed development. The underground power lines and foul and water mains within the existing Uisce Éireann services, located onsite will be clearly marked and all Site personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; and, • Local drainage will be surveyed and, where necessary, blocked off to prevent runoff of potentially contaminated surface water entering the surface water drainage system. A detailed Surface Water Management Plan will be included in the CEMP to be prepared by the Contractor, to deal with the treatment of surface water runoff prior to discharge to the site drainage system. **Waste Management** The following mitigation measures will be implemented during the construction phase: • All waste management procedures implemented onsite during the construction phase will be in accordance with the Outline CEMP submitted as part of this planning application, and a project specific RWMP to be prepared by the Contractor, in accordance with the '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*' (EPA 2021). The RWMP will take account of the relevant		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 14 – Material Assets	requirements of the Outline CEMP, the EIAR and any relevant planning conditions etc., and will be prepared by the Contractor in advance of the commencement of any construction or demolition works. • Precondition surveys will be conducted including asbestos surveys (as required). All recommendations arising from these surveys will be completed in advance of the commencement of any demolition works. • The contractor will supply all waste containers / skips, as required, for each of the identified waste streams. Waste will be segregated and removed to licensed facilities by licenced hauliers and all containers will be emptied before they are full to avoid overflowing. The contractor is to provide a waste forecast for waste types and quantities expected to be generated. • Good working practices and take back schemes will be used to reduce the amount of waste generated, as an initial step, with waste management routes for each waste stream to be recorded in the site Waste Management Plan. There is a target of 98% diversion of construction waste from landfill to be achieved with a minimum diversion of 90%. In order to reduce waste generation as far as possible, off cuts, surplus materials and packaging is to be returned to suppliers for closed loop recycling, single used plastics are to be avoided where possible and all materials are to be stored correctly to avoid waste generation from damage and contamination of incorrectly stored materials. • All waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. All waste will be removed from Site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the construction phase will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All waste removed offsite will be appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996 and 2001, as amendedand all subsequent waste management regulations). All waste management and disposal / recovery records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (FCC, EPA) as required. • Scheduling and planning the delivery of materials will be carried out on an '*as needed*' basis to limit any surplus materials; • Materials will be ordered in sufficient dimensions so as to optimise the use of these materials onsite, and will be carefully handled and stored so as to limit the potential for any damage; • Where feasible, sub-contractors will be responsible for the provision of any materials they require onsite in order to help reduce any surplus waste; • All loaded trucks entering and exiting the Site will be appropriately secured and covered;		

Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
Chapter 14 – Material Assets	• Dust will be controlled at entry and exits to the Site using wheel washes (as required) and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel / road sweeper washings will be contained and treated prior to discharge; • Secure lockable and controlled storage to be provided for the storage of chemicals and other hazardous materials, e.g., asbestos; • The Contractor is to provide details of proposed measures to be implemented to mitigate against Foreign Object Debris (FOD) and windblown materials; and, • All waste containers are to be enclosed and lockable to prevent FOD.		
	Built Services No mitigation measures are required during the operational phase. **Waste Management** Waste management during the operational phase of the development will be undertaken by private waste contractors (in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance), and regulated by Fingal County Council. Therefore, no further mitigation measures are required with regard to the transport and disposal or recovery of all waste streams which will be generated during the operational phase.		

Table 16-2 – Schedule of Environmental Commitments – Monitoring Requirements (Construction and Operational Phases)

Environmental Topic	Schedule of Environmental Commitments – Monitoring Measures	Construction Phase	Operational Phase
Chapter 4 – Population and Human Health	The proposed development will have minor adverse effects during the construction phase of the proposed development on population and human health as stated above in Table 4-3. However monitoring measures as presented within the relevant technical chapters (Chapter 7 - Air Quality; Chapter 8 – Climate; Chapter 9 – Noise and Vibration; Chapter 11 – Land, Soils and Geology; and Chapter 12 – Water) and Chapter 16 - Schedule of Commitments, will be implemented as part of the proposed development.		
Chapter 5 – Biodiversity	Given that the proposed development site is made up entirely of existing buildings and built land there is no suitable habitat for mammals such as badgers. Therefore, there is no need for the site to be assessed by an ecologist prior to the proposed works commencing. Given that the proposed development site is within a busy area within Dublin Airport and that the proposed development site and surrounding area is well lit, it is not likely that bats would be found roosting in the existing buildings. Therefore, no monitoring or survey is required for bat species.		

	Operational phase monitoring shall be undertaken by those in charge of the maintenance and management of the development.		
Chapter 8 – Climate	The assessment of effects on climate as a result of the construction, operation and maintenance and decommissioning phases of the proposed development are predicted to be not significant in EIA terms. Based on the predicted effects it is concluded that no additional monitoring beyond that given in Section 8.8.1 is required.		
Chapter 9 – Noise and Vibration	**Noise & Vibration Monitoring** The following ongoing noise monitoring programme is recommended for the site in relation to construction activities: • One unattended noise meter installed near the boundary of the Aer Lingus Office Building. Vibration meters should be installed in a secure location within the adjoining properties (i.e. the Aer Lingus building or the Dublin Airport pier) where possible, or in a suitable alternate location that can be used to gauge vibration impacts on the adjoining properties. Note that these locations are yet to be confirmed, alternative locations may prove to be more suitable or practicable once the construction programme has been fully realised.		
Chapter 11 – Land, Soils and Geology	A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site.		
Chapter 12 – Water	Regular checks and maintenance of the proposed surface water drainage system should be implemented.		
	daa carries out monthly monitoring of key surface water locations across the airport campus and at key downstream locations including the Cuckoo Stream. This monitoring programme will continue during both the construction and operational phases of the proposed development.		
Chapter 13 – Cultural Heritage	A suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the Fingal County Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.		
Chapter 14 – Material Assets	The Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (FCC, EPA) as required.		

17. Future Airport Development

17.1. Introduction

This chapter is intended to give an overview of future developments within Dublin Airport so that the environmental impacts of future plans can be assessed as far as practically possible as part of this EIAR, consistent with the purpose of the EIA Directive.

The proposed development is designed to ensure that Dublin Airport can cater more efficiently for the CBP, subject to planning permission being granted. It is considered appropriate that the competent authority assessing the proposed development would have an overview of long-term Dublin Airport plans, so that the proposed development can be viewed and assessed in the wider context.

There are numerous development proposals currently being prepared. A number of these development proposals will be required to seek planning permission for future airport growth to 40 mppa Future development proposals will require a grant of planning permission in order to be realised, which in itself will entail planning and environmental impact assessment.

The proposed development is a standalone application and is not reliant on any other project or future airport growth to be realised. The proposed development is designed to ensure that it will have capacity to cater for the planned growth subject to planning permission, Best practice in design of large infrastructure means that it is designed not just to cater for existing requirements but that it is fit for purpose over the entire life of that infrastructure so far as practically foreseeable.

An awareness of future airport plans is relevant in considering the proposed development given the potential for interaction in the future. The future development plans discussed hereafter are listed in relation to the future development in Dublin Airport and do not form part of the current application for the proposed development.

For the purposes of clarity, it is noted that all relevant committed developments i.e. consented developments and planned projects currently pending a planning decision, are assessed in terms of potential cumulative impacts with the proposed development within Chapter 18 – Cumulative Impacts. This chapter (Chapter 17 – Future Development), focuses on all relevant projects / schemes which warrant consideration with respect to potential environmental effects, but which have not yet been consented or lodged and are subject to change before final design is confirmed.

17.2. Assessment Methodology

Preceding chapters in this report have identified the assessment methodology and current State of the Environment in relation to the proposed development. Desk studies (including available surveys) have informed the understanding of current environmental conditions.

The proposed development is assessed, with regards to the potential for environmental effects to arise from other future projects. Projects are broadly described under the following key categories:

- **Planned Upcoming Projects** – Projects with advanced design though not yet finalised and not lodged; and,
- **Planned Future Projects** – Future projects that are known but have not yet undertaken assessment or have been finalised.

Typically, the level of design information available for each of the above categories of projects decreases, as per the above list order. Accordingly, an assessment of the potential environmental effects has been carried out, for each of the above groups of projects as far as is practically possible. It is noted that the assessment is not an EIA and that each project will be subject to assessment when planning application is made.

17.2.1. Limitations & Assumptions

There are numerous future proposals that are still under development and proposed for Dublin Airport with the potential that final proposals may be subject to change in scale, scope and / or nature from those listed below.

Factors include budgetary constraints, safety and security reviews, and the need to ensure proposals meet the constantly evolving needs of passengers and airlines. In the period 2020-2022, the Covid-19 pandemic demonstrated that circumstances, and hence plans, can change unexpectedly and significantly. Such global events and other significant matters external to the aviation sector but which affect the sector are most often unpredictable in advance.

17.3. Future Development Overview

17.3.1. Planned Upcoming Projects

17.3.1.1. Airfield Drainage Project (ADP)

The Drainage Master Plan (DMP) is a holistic long-term masterplan for drainage infrastructure at Dublin Airport. The DMP contains daa's commitments to undertaking incremental actions now and as the Airport grows in the future, in line with the masterplan, ensuring that any impacts on water quality of the waterbodies surrounding the airport campus will be positive and support compliance with the water quality objectives of the Water Framework Directive (WFD).

The Airfield Drainage Project (ADP) has been designed to meet all of the objectives of the DMP at project level. The purpose of the ADP will be:

- To provide a nett improvement in the degree of protection afforded to the receiving waters by the surface water management system;
- To optimise the performance of the surface water management system at Dublin Airport for improved efficiency, greater operational flexibility and resilience to a broad range of extreme weather events; and,
- To improve the hydraulic capacity of the surface water network and alleviate historic capacity issues.

At this point in time the ADP is at preliminary design stage, and it is intended for the ADP to propose the following:

Upgrades to existing drainage infrastructure and construction of additional drainage infrastructure to improve performance of the surface water management system at Dublin Airport including:

- a contamination detection and response (CD&R) system comprising detection devices, network decision points (DPs), control kiosks, and ancillary infrastructure including local access roads, local drainage and communications and power ducts;
- clean water supply pipelines consisting of large diameter trunk pipelines;
- airfield contaminated pipelines consisting of large diameter trunk pipelines;
- upgrades to the West Apron surface water collection network including reconfiguration of the existing network, construction of an underground attenuation tank, installation of a local CD&R system, network DPs and a control kiosks, construction of an underground pollution storage tank, a pumping station, and ancillary development including local ductwork, local access roads and local drainage;
- upgrades to the existing surface water collection network in the vicinity of the South Apron including reconfiguration of the existing network, construction of network DPs, upgrade of the existing flow diversion structure (FDS) and reconfiguration of the existing Cuckoo supply channel;
- a central pollution control facility (CPCF) consisting of underground pollution control storage tanks, a pumping station, a discharge pipeline to the Uisce Éireann network, mechanical and electrical equipment, a control building, an electrical substation, and ancillary development including a local access road, local drainage, and ducting;
- a CPCF pipeline consisting of a large diameter trunk pipeline; h) a central supervisory control and data acquisition (SCADA) system comprising kiosks and associated electrical power and signal connections;
- repurposing of the central section of the existing Airfield Trunk Culvert (ATC) as a contaminated pipeline; and
- ancillary and associated development including pipework, mechanical and electrical service connections and upgrades, temporary compounds and site works.

17.3.2. Planned Future Projects

17.3.2.1. Capital Investment Programme 2020+

Dublin Airport has been a regulated entity as of 2011, required periodically to submit its proposals for capital investment to the Commission for Aviation Regulation (CAR). In February 2019, the plans for investment to commence the next stage of Dublin Airport's development were submitted to CAR as the Capital Investment

Programme (CIP 2020+)[29], with the objective of transforming the airport into a major European airport, welcoming 40 mppa and continuing as one of the top five European transatlantic hubs.

daa is undertaking the CIP with significant infrastructural investments that are intended to improve the built environment, from 2022-2026. This programme of incremental infrastructure replacement and upgrades will be delivered in a sustainable manner to enable Dublin Airport maintain existing and future operations subject to planning permission were relevant. The CIP inform the projects that should be considered in the Planned Future Projects section of this Chapter.

17.3.2.2. Infrastructure Application

The Infrastructure Application (IA) is a project to increase the passenger capacity of the airport to 40mppa and the infrastructure required to facilitate that growth, likely to be reached post 2030, whilst maintaining service levels at the airport.

Currently at the design stage, in broad terms the IA would include:

- New Apron 7;
- South Apron Expansion;
- North Apron Development;
- Terminal 1 Central Search;
- Long Term Car Parking Red;
- New Staff Car Park North;
- Terminal 2 Multi-Storey Car Park;
- Underpass beneath Runway 16/34;
- Surface Access Infrastructure;
- Airfield Drainage Project; and,
- Construction Compounds.

Of note, the IA would also seek permission to raise the annual passenger capacity (currently 32mppa) to 40mppa. Surveys for the IA are ongoing and no assessments have yet been completed. Further work is required on the assessment of effects.

The principal operational environmental impact of the IA is likely to be the increase in air and ground traffic movements from Dublin Airport, with associated aircraft / ground noise and greenhouse gas emissions. Construction waste will be generated during the construction phase and this will entail and increase in traffic volumes, including HGV traffic on the major roads around the airport. As data/assessment are not currently available, it unknown as to whether this would lead to significant, albeit, temporary air or noise effects in the vicinity of the airport during the construction period but mitigation of any such impacts is a key focus for the environmental assessment work to be undertaken for the IA. The timeline for the construction programme of the IA is anticipated to be ca. 10 - 15 years, offering opportunities to manage the timing of potential impacts to limit their cumulative effects.

17.4. Assessment of Upcoming and Future Projects

17.4.1. Planned Upcoming Projects

17.4.1.1. Airfield Drainage Project (ADP)

The ADP in its current form has been assessed against the proposed development to consider the likely significant cumulative environmental effects.

While the proposed project is located within the same surface water management catchment at Dublin Airport, i.e. the Cuckoo Stream Sub-catchment, and so surface water run-off from the Proposed Development ultimately discharges to the same receiving surface waters as the ADP, the following key points should be noted:

- The Proposed Development is located up hydraulic gradient of the proposed ADP development;
- There is no overlap in the red-line boundary of either project. There will be no construction works within the Proposed Development site boundary; and,

[29] https://www.dublinairport.com/corporate/airport-development/cip-2020

- An EIAR is currently being prepared for the proposed ADP project which will assess any likely potential significant environmental effects which may arise from the ADP project, and which will also take account of potential cumulative effects including the proposed development.
- Based on the justification presented in Table 17.2 it is not likely that significant cumulative environmental effects will arise.

Table 17-1 - Potential Environmental Effects of the Airfield Drainage Application

Environmental Factor	Potential Demolition Effect	Potential Construction Effect	Potential Operational Effect	Comments
Population and Human Health	Not Significant to slight	Not Significant to slight	Insignificant	There is the potential for future airport developments including the ADP There is also potential for loss of amenity associated with traffic, noise, dust and vibration during construction, however this would be minimised through the introduction of construction environmental management and construction traffic management measures. A full assessment of the effects on population and human health will be undertaken as part of any future planning application. Taking into account this information it is unlikely that there would be a change to the conclusion of this EIAR. i.e., that effects from the Proposed Development on the Population & Human Health factor would not likely be significant.
Traffic and Transport	Moderation, negative and short-term.	Moderation, negative and short-term.	Insignificant	Traffic around the airport is likely to increase as a result of construction traffic associated with the proposed ADP application. However based on the location, scale and nature of the proposed ADP project and any likely associated effects with regards to traffic (based on available information and taking account of proposed mitigation measures), the conclusions of this EIAR in respect of construction traffic would be unaffected. Accordingly the cumulative effects from the Proposed Development on Traffic, are not likely to be significant.
Major Accidents and Disasters	Low to Moderate Risk identified. Mitigation will reduce risk to low.	Low to Moderate Risk identified. Mitigation will reduce risk to low.	Insignificant	There would be no change to the conclusions of this EIAR in respect of Major Accidents & Disasters as risks of such to the Proposed Development from offsite hazards are considered unlikely and the nature of such offsite hazards would not change. Similarly, risk from the Proposed Development to offsite receptors is considered unlikely. Accordingly the cumulative effects from the Proposed Development in relation to major accidents and disasters, are not likely to be significant.
Air Quality & Climate	Temporary, direct, negative and imperceptible, with mitigation (Air Quality). Climate effects will be temporary,	Temporary, direct, negative and imperceptible, with mitigation (Air Quality). Climate effects will be temporary, neutral, and imperceptible.	Neutral, long-term and imperceptible.	There is potential for increase in public exposure to short-term concentrations of small particles and pollutants during construction, although construction impacts would be managed by a CEMP. Based on available information, any likely effects with regards to Air Quality and Climate arising from the proposed ADP application, once proposed mitigation measures are in place will not likely be significant, and the conclusions of this EIAR in respect of Air Quality and Climate would be unaffected. Accordingly the cumulative effects from the Proposed Development on Air Quality and Climate, are not likely to be significant.

	neutral, and imperceptible.			
Noise & Vibration	Not Significant to Slight & Not Significant to Moderate (NSL4), with mitigation.	Not Significant to Slight & Not Significant to Moderate (NSL4), with mitigation.	Neutral, imperceptible and long term.	Based on available information, any likely effects with regards to Noise Quality and Vibration arising from the proposed ADP application, once proposed mitigation measures are in place, will not likely be significant, and the conclusions of this EIAR in respect of Noise Quality and Vibration would be unaffected. Accordingly the cumulative effects from the Proposed Development on Noise Quality and Vibration, are not likely to be significant.
Landscape and Visual	Moderate/Minor and not significant adverse effects on character, with mitigation. Minor/negligible or Negligible and not significant effects on views, with mitigation.	Moderate/Minor and not significant adverse effects on character, with mitigation. Minor/negligible or Negligible and not significant effects on views, with mitigation.	Not significant.	Based on available information, any likely effects with regards to Landscape and Visual arising from the proposed ADP application, once proposed mitigation measures are in place, will not likely be significant, and the conclusions of this EIAR in respect of Landscape and Visual would be unaffected. Accordingly the cumulative effects from the Proposed Development on Landscape & Visual, are not likely to be significant.
Cultural Heritage	Insignificant effects	Insignificant effects	Not significant.	Assuming the implementation of proposed mitigation measures, based on available information, no significant residual effects are predicted to occur in relation to cultural heritage, archaeological or architectural heritage, and the conclusions of this EIAR in respect of Cultural Heritage would be unaffected. Accordingly the cumulative effects from the Proposed Development on Cultural Heritage, are not likely to be significant.
Land, Soils and Geology	Not significant and Imperceptible, with mitigation.	Not significant and Imperceptible, with mitigation.	Imperceptible	There is potential for the mobilisation of contaminants via numerous pathways to subsurface during construction, but such impacts are capable of mitigation through the application of a CEMP. Also potential for loss of soil cover, soil erosion and compaction during construction, but again this can be mitigated through application of a CEMP. The conclusions of this EIAR in terms of the Land & Soils factor would be unaffected based on the following key points: There will be no impacts with regards to land (including land take), soils or geology during the operational phase.

				During the construction phase, taking account of proposed mitigation measures, effects with respect to offsite soil removal is likely to be slight negative and permanent. During the construction phase, taking account of proposed mitigation measures, effects (with the exception of offsite soil removal) will be slight negative and short term in duration. Accordingly, based on available information, the cumulative effects from the Proposed Development on Land, Soils and Geology, are not likely to be significant.
Biodiversity	No significant effects.	No significant effects.	No significant effects.	An Appropriate Assessment will be submitted for the ADP to determine whether effects to designated conservation sites may occur. Construction phase controls and mitigation measures (as per the EIAR and NIS) will be implemented during the proposed ADP development. Based on available information it is likely that there will be no significant ecological effects arising from construction works proposed for the ADP project, once mitigation measures are in place. Designated conservation sites will not likely be impacted by the proposed development during construction. The conclusions of this EIAR in terms of the Biodiversity factor would be unaffected based on the following key points: The proposed development site is comprised of existing buildings within a built-up area of Dublin Airport and is of low ecological value. Taking account of proposed mitigation measures, the residual ecological impacts of the development proposals are not expected to be significant and are expected to be localised to the proposed works site and immediate environs. Taking account of proposed mitigation measures and any monitoring requirements, especially in relation to surface water run-off, no cumulative impacts are expected as a result of the proposed development. Accordingly the cumulative effects from the Proposed Development on Biodiversity, are not likely to be significant.
Water	Imperceptible, with mitigation.	Imperceptible, with mitigation.	Significant Positive long-term effects likely (improvement in quality and alteration of flows). Imperceptible neutral long-term effects (change to hydrological system).	There is potential for the mobilisation of contaminants via numerous pathways to surface waters and groundwater during construction, but such impacts are likely to be capable of mitigation through the application of a CEMP. The conclusions of this EIAR in terms of the Water factor would be unaffected as, taking account of proposed mitigation measures, any effects on surface water or groundwater will be temporary and slight adverse, during both the Construction and Operational Phase of the proposed development. Accordingly, based on available information, the cumulative effects from the Proposed Development on Water, are not likely to be significant.

Material Assets	Neutral, imperceptible, and short-term, with mitigation.	Neutral, imperceptible, and short-term, with mitigation.	Neutral, imperceptible, and long-term, with mitigation.	There is potential for additional waste to be generated during construction and operation, as well as the use of materials during the construction process. Details to assess the extent of such impacts are not yet known. The conclusions of this EIAR in terms of Material Assets (Built Services) would be unaffected based on the following key points: Taking account of proposed mitigation measures, the effects of the proposed development (in terms of built services) will be short-term and slight adverse during the construction phase, and long-term and not significant during the operational phase. Taking account of proposed mitigation measures, the effects of the proposed development (in terms of waste management) will be short-term and imperceptible during the construction phase, and long-term and imperceptible during the operational phase. Accordingly, based on available information, the cumulative effects from the Proposed Development on Material Assets, are not likely to be significant.

17.4.2. Planned Future Projects

This section addresses planned future projects that have been identified in the CIP 2020 but are still at an early design stage and no environmental assessment have been undertaken.

17.4.2.1. Infrastructure Application (IA)

According to the latest projections, provided by daa, potential passenger demand at Dublin Airport will reach 40mppa between 2027 and 2031. Therefore, it is reasonable to assume that daa would seek to have permission for and have aimed to complete construction, providing the infrastructure necessary to allow the airport to operate at 40mppa whilst maintaining service levels, by 2030.

A full Environmental Impact Assessment of the likely significant environmental effects of an airport operating at 40mppa and appropriate mitigation, as required by the EIA Directive, will be presented where appropriate, taking all planning and environmental impacts into account, when a planning application for the IA is made to FCC.

The potential for the proposed development to result in likely significant cumulative environmental effects with respect to the Infrastructure Application has been reviewed.

Based on the justification presented in Table 17.2 it is not likely that significant cumulative environmental effects will arise.

17.4.2.2. Other daa Projects

It is unlikely that any of the other daa projects will lead to significant environmental effects, although they may generate noise and some traffic on the surrounding roads during the construction phase. As these projects are 'business as usual' projects, it is reasonable to conclude that, as the works are of similar scale to current and previous works, the effects on noise and traffic are already part of the Current State of the Environment due to existing ongoing upgrade and maintenance projects.

Table 17-3 lists these projects and gives a brief description of what they entail with emphasis on any potential environmental effects. In some cases, there is potential for interaction with the construction of the proposed development, as they would occur close to or within the site. It is not likely that significant environmental effects would occur as a result of interaction due the nature of the proposed works and distance from sensitive receptors from the site and wider environs and hence will not impact the conclusion of this EIAR.

Table 17-2 - Potential Environmental Effects of the Infrastructure Application

Environmental Factor	Potential Demolition Effect	Potential Construction Effect	Potential Operational Effect	Comments
Population and Human Health	Not Known	Likely to be beneficial employment effects	Not Known	There is the potential for IA to have beneficial effects from airport operations, construction and supply chain jobs created due to increased spending in the local area by employees. There is also potential for loss of amenity associated with traffic, noise, dust and vibration during construction, however this would be minimised through the introduction of construction environmental management and construction traffic management measures. Effects upon the actual and perceived health and well-being of local residents are possible, owing to additional air traffic movements associated with an increase to 40mppa. This is not easy to quantify at this stage; although the number of passengers passing through the airport would be 25% higher than in 2018 this would not necessarily translate into 25% more flights, and aircraft in future are likely to be quieter than at present. A full assessment of the noise impacts and those on population and human health will be undertaken as part of any future planning application. Taking into account this information it is unlikely that there would be a change to the conclusion of this EIAR. i.e., that effects from the Proposed Development on the Population & Human Health factor would not likely be significant.
Traffic and Transport	Not Known	Likely to be adverse effects from construction traffic	Not Known	Traffic around the airport is likely to increase as a result of construction traffic and operation of a 40mppa airport, however the extent is not known and could be offset / reduced by the introduction of more sustainable transport options such as BusConnects and Metrolink and implementation of the forthcoming campus Mobility Management Plan. A modelling exercise is being undertaken to determine the effect. This is being prepared for the IA itself but is not available currently. The conclusions of this EIAR in respect of construction traffic would be unaffected based on the following points: From an Operational Traffic point of view, the proposed development is anticipated to replace existing services and, therefore, provide no increase in overall traffic. In accordance with the thresholds set out in TII's Traffic and Transport Guidelines, no junctions were required to be brought forward for detailed assessment and it is considered that the cumulative construction traffic impacts due to the construction activity for the proposed development is below the thresholds outlined in the TII guidelines. Accordingly the cumulative effects from the Proposed Development on Traffic, are not likely to be significant.
Major Accidents and Disasters	Probably none	Probably none	Not Known	A modelling exercise would need to be undertaken to determine the effect of changes to the number of operational air traffic movements. This will be prepared for the IA but is not available currently. There would be no change to the conclusions of this EIAR in respect of Major Accidents & Disasters however, as risks of such to the Proposed Development from offsite hazards are considered unlikely and the nature of such offsite hazards would not change. Similarly, risk from the Proposed Development to offsite receptors is considered unlikely. Accordingly the cumulative effects from the Proposed Development in relation to major accidents and disasters, are not likely to be significant.

Air Quality	Not Known	Not Known	Not Known	There is potential for increase in public exposure to short-term concentrations of small particles and pollutants most commonly associated with road traffic emissions during construction, although construction impacts would be managed by a CEMP. There is potential for increase in public exposure to pollutants most commonly associated with combustion during operation of the IA, but the likelihood is that there would be little change in assessed air quality if the airport was operating at 40mppa. However, the data to undertake the modelling is not currently available. An air quality model will be prepared for the IA in due course. The conclusions of this EIAR in terms of the Air Quality factor would be unaffected based on the following key points: Provided the mitigation measures outlined in this EIAR are in place for the duration of the construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant Cumulative impacts to air quality will be direct, short-term, localised, negative and imperceptible The operational phase of the Proposed Development is not a significant source of pollution. Accordingly the cumulative effects from the Proposed Development on Air Quality, are not likely to be significant.
Noise & Vibration	Not Known	Not Known	Adverse	Noise from the airport operating at 40mppa would be expected to increase given the growth in air traffic movements and changes in aircraft movements on the ground, taxiing and engine testing. Overall noise effects are likely to reduce over time if past trends are continued as the fleet is modernised. A full noise impact assessment will be undertaken for the IA in due course. The conclusions of this EIAR in terms of noise would be unaffected based on the following key points: With mitigation the resultant noise impact during construction is calculated to be negative, negligible to slight and temporary at residential receptors and negative, moderate to significant and temporary impact at the nearest commercial buildings. Vibration impacts at offsite residential receptors will be imperceptible. Vibration impacts at nearby commercial buildings will be a negative, brief, moderate impact. Operational noise impacts will not occur as a result of the development. Inward noise impacts with the mitigation measures outlined in place will be neutral, not significant and permanent. Accordingly the cumulative effects from the Proposed Development on Noise Quality & Vibration, are not likely to be significant.
Climate and Carbon	Probably none	Not Known	Not Known	Scope 1+2 carbon emissions from the airport operating at 40mppa would tend to increase, however this would be offset by measures in the Applicant's CRS and incorporated in the IA. The exact balance between these effects is not clear at present but could be expected to represent an improvement overall in the medium term, in line with the CRS and government policy. Emissions will be modelled for the IA in due

				course. The conclusions of this EIAR in terms of the Climate factor would be unaffected. Carbon emissions from the construction of the Proposed Development would not be affected by the IA. The cumulative effects from the Proposed Development in relation to Climate and Carbon, are not likely to be significant.
Landscape and Visual	None	None	None	Unlikely that there would be significant landscape or visual effects as development would be primarily confined to the airport campus. The conclusions of this EIAR in terms of the Landscape & Visual factor would be unaffected based on the following key points: With the adoption of mitigation measures, the overall effects on landscape character may be considered to be slight beneficial in significance for the SASC building and neutral in significance for the CBP extension. With the adoption of mitigation measures, the overall effects on visual amenity may be considered to be of slight beneficial significance for the SASC building and neutral in significance for the CBP extension. Accordingly the cumulative effects from the Proposed Development on Landscape & Visual, are not likely to be significant.
Cultural Heritage	Not Known	Not Known	Not Known	There is potential for physical and setting impacts on known cultural heritage assets, and possible physical impacts on unknown archaeological assets. However, it is unlikely that there would be significant cultural heritage effects as development would be primarily confined to the airport campus. Subject to the implementation of mitigation measures during the construction phase of the development, no residual cumulative impacts on archaeological, architectural and cultural heritage are predicted. The conclusions of this EIAR in terms of the Cultural Heritage factor would therefore be unaffected. Accordingly the cumulative effects from the Proposed Development on Cultural Heritage, are not likely to be significant.
Land, Soils and Geology	None	None	None	There is potential for the mobilisation of contaminants via numerous pathways to subsurface during construction, but such impacts are capable of mitigation through the application of a CEMP. Also potential for loss of soil cover, soil erosion and compaction during construction, but again this can be mitigated through application of a CEMP. The conclusions of this EIAR in terms of the Land & Soils factor would be unaffected based on the following key points: There will be no impacts with regards to land (including land take), soils or geology during the operational phase. During the construction phase, taking account of proposed mitigation measures, effects with respect to offsite soil removal is likely to be slight negative and permanent. During the construction phase, taking account of proposed mitigation measures, effects (with the exception of offsite soil removal) will be slight negative and short term in duration. Accordingly the cumulative effects from the Proposed Development on Land, Soils and Geology, are not likely to be significant.
Biodiversity	Not Known	Not Known	Not Known	There is potential for increased disturbance of wintering birds using functional land at the airport by increased noise / visual disturbance from increased aircraft flights and possible increase in bird strikes.

				Effects on European Sites are also possible with an increase in flights over such locations. An Appropriate Assessment will be undertaken for the IA in due course to determine whether such effects might occur. The conclusions of this EIAR in terms of the Biodiversity factor would be unaffected based on the following key points: The proposed development site is comprised of existing buildings within a built-up area of Dublin Airport and is of low ecological value. Taking account of proposed mitigation measures, the residual ecological impacts of the development proposals are not expected to be significant and are expected to be localised to the proposed works site and immediate environs. Taking account of proposed mitigation measures and any monitoring requirements, especially in relation to surface water run-off, no cumulative impacts are expected as a result of the proposed development. Accordingly the cumulative effects from the Proposed Development on Biodiversity, are not likely to be significant.
Water	None	None	None	There is potential for the mobilisation of contaminants via numerous pathways to surface waters and groundwater during construction, but such impacts are likely to be capable of mitigation through the application of a CEMP. The conclusions of this EIAR in terms of the Water factor would be unaffected as, taking account of proposed mitigation measures, any effects on surface water or groundwater will be temporary and slight adverse, during both the Construction and Operational Phase of the proposed development, Accordingly the cumulative effects from the Proposed Development on Water, are not likely to be significant.
Material Assets	Not Known	Not Known	Not Known	There is potential for additional waste to be generated during construction and operation, as well as the use of materials during the construction process. Details to assess the extent of such impacts are not yet known. The conclusions of this EIAR in terms of Material Assets (Built Services) would be unaffected based on the following key points: Taking account of proposed mitigation measures, the effects of the proposed development (in terms of built services) will be short-term and slight adverse during the construction phase, and long-term and not significant during the operational phase. Taking account of proposed mitigation measures, the effects of the proposed development (in terms of waste management) will be short-term and imperceptible during the construction phase, and long-term and imperceptible during the operational phase. Accordingly the cumulative effects from the Proposed Development on Material Assets, are not likely to be significant.

Table 17-3 - Upcoming daa projects

Project	Details	Comments
Cycle Infrastructure	Development of a number of cycle shelters and a 'cycle-port' on the airport campus.	Currently at Feasibility stage. Based the scale and nature of the Cycle Infrastructure project, no likely significant cumulative environmental effects will arise.
Cargo Relocations	Development of new cargo facilities and relocation of tenants	Currently at Feasibility stage. Based the scale and nature of the Cargo Relocations project, no likely significant cumulative environmental effects will arise.
Staff Car Park	Staff Car Park – Harristown	Currently at pre-planning stage. Based on the location of the Staff Car Park project, no likely significant cumulative environmental effects will arise.
Car Rental	Upgrade Car Rental Facilities	Currently at Feasibility stage. Based the scale and nature of the Car Rental project, no likely significant cumulative environmental effects will arise.

17.5. Summary

Given the information available at this time, an overview and broad assessment of the possible environmental effects of future development plans has been provided. It should be noted that these proposals are likely to change as many have not yet been the subject of preplanning consultations or other stakeholder engagement (including scoping) which may affect the assessment methodology and final designs. Other influencing factors include budgetary constraints, safety and security reviews, and the need to ensure proposals meet the evolving needs of passengers and airlines.

The future development plans discussed in this chapter do not form part of the proposed development and will be subject to requiring full consents and additional environmental assessments as deemed necessary before they can be implemented.

The above assessment does not give rise to any concern about the likely environmental effects of the proposed development when viewed in the context of policy and plans for the future expansion of Dublin Airport and the environmental impact. In addition, it provides the local authority with an overview of future development plans so that, consistent with the purpose of the EIA Directive and case law, account be taken of the impacts of future plans in the context of the assessment of the likely significant environmental effects of the Proposed Development.

18. Cumulative Impacts

18.1. Introduction

This chapter assesses the potential for the proposed development to act in combination with committed developments within the vicinity to result in cumulative impacts on the environment. Each of the technical chapters within this EIAR (i.e. Chapters 4 to 14) have considered the potential for cumulative impacts with committed developments in the vicinity of the proposed development.

The EIA Directive states that at EIAR should contain cumulative effects, which are defined as:

'A description of the likely significant effects of the project on the environment resulting from…the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.'

The cumulative effects assessment considers developments which have potential for cumulative effects with the Proposed Development and which have planning permission and/ or which are in the planning system but where a planning decision is not expected to have been made by the time the Proposed Development is operational. Those developments that already exist, including existing facilities in the airport itself, are part of the Current State of the Environment and therefore are already part of the assessment baseline.The assessments of interactions and cumulative effects presented in this chapter draw on the method of assessment and assessment findings reported in Chapters 4 to 14 and information available in the public domain relating to other known schemes within the study area (as described below).

18.2. Methodology

Potential cumulative impacts are defined as 'the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects' (EPA 2022) and have been considered for each environmental topic within this EIAR.

A summary of all committed development in the immediate environs of the proposed development, which have been approved by Fingal County Council and an Bord Pleanála (ABP) within the last 5 years, and/ or which are in the planning system but where a planning decision is not expected to have been made by the time the Proposed Development is operational. have been reviewed as part of the preparation of this EIAR. The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works or property retention works) or are considered to be a reasonable distance from the proposed development and do not warrant further consideration as part of this assessment.

Based on a review of planning records a list of committed developments has been compiled which require further consideration in relation to potential cumulative effects with the Proposed Development, as part of this assessment.

18.3. Cumulative Impact Assessment

Cumulative effects consider the impacts of other schemes which have potential for cumulative effects with the Proposed Development. As explained above, this chapter focusses on developments which have planning permission and / or which are in the planning system pending a planning decision, but which do not form part of the Current Receiving Environment or the Future Receiving Environment.

These projects have been assessed, as follows:

- Cumulative Impacts Assessment for Consented Projects - daa developments; and,
- Cumulative Impacts Assessment for Consented Projects – wider environs.

Refer to Table 18.1 and 18.2 respectively.

The locations of all consented development assessed are presented in Figure 18.1 to 18.3.

Those developments that already exist, including existing facilities in the airport itself, are part of the Current State of the Environment and therefore are already part of the assessment baseline. Other future airport related projects have been assessed separately within Chapter 17 – Future Airport Development.

Table 18-1 - Cumulative Impacts Assessment for Consented Projects - daa developments

Planning Application Ref	Projects	Project Summary	Cumulative Impacts Assessment
F23A/0253 – Ardgillan	Noise Monitoring Terminals at various locations (outside airport boundary)	The development on land within the car park of Ardgillan Community College, Castleland, Balbriggan, Co Dublin. the development will consist of the installation of an aircraft noise monitoring terminal on a standalone, tiltable mast structure (6m in height) along with associated works including electricity connection.	Taking into account the location, nature and scale of the proposed development, and based on available planning documentation submitted for the Ardgillan Community College project significant cumulative environmental effects (with respect to the proposed Ardgillan Community College project) are not likely to occur.
F23A/0258 – Donabate		The development will consist of the installation of an aircraft noise monitoring terminal on a standalone, tiltable mast structure (6m in height) along with associated works including electricity connection.	Taking into account the location, nature and scale of the proposed development, and based on available planning documentation submitted for the Donabate project significant cumulative environmental effects (with respect to the proposed Donabate project) are not likely to occur.
FS5/036/21	Runway 10 Line Up Project	This project comprises the construction of a new concrete pavement area connecting the existing Runway 10 and the existing northern Taxiway S to facilitate a new runway line-up point and associated drainage infrastructure, signage, road markings and lighting. This Section 5 application was lodged by daa plc. on 05/07/2021, with further information requested.	Taking into account the location, nature and scale of the proposed development, and based on available planning documentation submitted for the Runway 10 Line up project (Section 5 application), significant cumulative environmental effects (with respect to the proposed Runway 10 Line up project) are not likely to occur.
F23A/0245	Hangar 7 Project	This project comprises the development of a single-storey, part two-storey four-bay hangar designed to accommodate up to 4 no. Code C Aircraft, with associated maintenance facilities, ancillary offices and staff areas, as well as associated demolition works and ancillary works. This application was lodged by Ryanair DAC on 12/05/2023.	Taking into account the location, nature and scale of the proposed development, and based on available planning documentation submitted for the Hanger 7 project; significant cumulative environmental effects (with respect to the proposed Hanger 7 project) are not likely to occur.
F23A/0132	North Apron Extension Project	This project comprises the development of an extension of North Apron to accommodate the proposed Hangar 7 development..	Taking into account the location, nature and scale of the proposed development, and based on available planning documentation submitted for the North Apron Extension project; significant

			cumulative environmental effects (with respect to the proposed North Apron Extension project) are not likely to occur.
FW22A/0021	PV Panels	Ground mounted solar photovoltaic (PV) array with associated development and ancillary works	Due to the location (south east of the airport boundary at the R122) nature and scale of this project, it is unlikely there will be significant cumulative effects during construction of the proposed development. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur.
F19A/0084	Thermal Storage Tank	Thermal Storage Tank to the south of the Terminal 2 Energy Centre	The application is for works within the same vicinity as the Proposed Development However, due to the programme of construction, significant cumulative effects are not likely to arise. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur.
F22A/0316	Thermal Storage Tank	Thermal storage tank adjacent to Terminal 2 Energy Centre along with all associated site works including the erection of a new boundary fence around the tank, as previously permitted, be used to store excess heat and improve the energy efficiency of the existing combined Heat and Power Plant serving Terminal 2.	The application is for works within the same vicinity as the Proposed Development However, due to the nature and scale of this project, it is unlikely there will be cumulative significant effects during construction of the proposed development. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur.
F19A/0426	Airside Operational Buildings	Animal Welfare Facility, Airside Operations Facilities & Substation	The application is for works within the same vicinity as the Proposed Development However, due to the nature and scale of this project, it is unlikely there will be significant cumulative effects during construction of the proposed development. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur
F20A/0553	Terminal 1 Upgrade	Façade and office upgrade	The application is for works within the same vicinity as the Proposed Development However, due to the nature and scale of this project, it is unlikely there will be significant cumulative effects during construction of the proposed development. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur.
F20A/0550	North Apron Extension, Apron 5H	Extension of North Apron for 12 no. replacement aircraft stands & ground servicing equipment area	Due to the location (North Apron), nature and scale of the scheme, it is unlikely there will be significant cumulative effects during construction. No cumulative operational effects are likely. Therefore, no cumulative significant effects are likely to occur.