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Document Title	**Construction Environmental Management Plan**
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The Client	Microsoft	**Microsoft**
The Contractor/ PSCS	WINTHROP ENGINEERING EXCELLENCE	**Winthrop Engineering & Contracting Ltd.**
Project Scope	This document outlines the Winthrop Engineering & Contracting Ltd. Construction Environmental Management plan on the DUB 14/15 project. It details the typical management arrangements in place to facilitate the delivery of the project to the necessary environmental standards and requirements	

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1. EXECUTIVE SUMMARY

The Construction Environmental Management Plan provides the specific measures that are in place and procedures to be followed for the scope of the construction works. This document will remain a live document which will be subject to change as the plan evolves during the project. This Construction Environmental management plan will also detail how the environmental standards will be managed during works on the DUB 14/15 Project. The CEMP will cover all potentially polluting activities.

Winthrop will adhere to the noise and vibration monitoring and mitigation measures outlines in the Environmental Impact assessment.

All personnel working on the site will be trained in the implementation of the procedures. This is in keeping with industry standards for such developments.

The plan describes how environmental practices will be addressed on a day-to-day basis and details the different areas which will be addressed.

Construction Impacts

The primary impacts from construction are anticipated to include:

- Temporary impacts on the soils and geology of the site during construction
- Effects on the road network of the industrial estate and its environs due to construction workers and other staff attending site during preparation, construction and commissioning phases;
- Impacts on the flora and fauna and Biodiversity of the site i.e. removal of hedgerows and treelines for construction
- Impacts on the surface water network on site due to realignment of drainage systems;

The three main potential impacts on local residences and businesses associated with the proposed development will be in relation to traffic, noise, air (dust), and visual impact..

There will be ongoing noise generation dust and emissions as a result of construction traffic and other activities throughout the construction process. However, there will be limits on noise and hours of operation, along with implementation of appropriate noise, vibration and dust control measures, which will ensure that impact is kept to a minimum.

Furthermore, given the distance between the site and the nearest sensitive locations, negative impacts generated during construction are expected to be negligible and temporary.

Construction Phase

In accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, a safety management system will be put in place on-site to minimise any risks to both construction personnel and site visitors. The site will not be accessible to the public and will have strict procedures in place for allowing entrance to visitors and contractors.

Traffic mitigation measures proposed to reduce the impact of additional traffic to and from the development

Similarly mitigation measures to reduce impact on human health as a result of construction noise, vibration and dust emissions. Measures will reflect best construction practice including pro-active

control of dust and other air pollutants to minimise generation of emissions at source. The measures will ensure compliance with all EU ambient air quality legislative limit values..

2. PROJECT DESCRIPTION

Winthrop Engineering & Contracting Ltd. have been engaged by the client, Microsoft to service to fulfil construction project as detailed below:

Site A is the main development site which will contains the data centres, central administrative building and associated works. Site B will provide a temporary car parking for workers during the construction period of the project.

The western half of Site A borders the Griffeen River and is predominantly vacant land that also contains a hardstanding area and a temporary construction road associated with the construction of MS Data Centres DUB09, DUB10, DUB12 & DUB13 to the east and which is nearing completion.

South of the temporary road is the vacant dwelling and attendant areas which is to be removed.

Site B is located c.1.2km to the northeast of Site A and north of the main entrance to the Business Park.

This site is flat, grassed and currently vacant. It lies east of the Business Park Attenuation Lake. To the north is the Grand Canal and Greenway. A buffer of trees and planting c.45m deep separates the site from the greenway.

Demolition of existing single storey vacant house, garage, and outhouse (total gross floor area (GFA) c.291.2 sq.m) and removal of existing temporary construction car park.

- Construction of a single 1- 4 storey Central Administration Building and 2 no. 2-storey (with mezzanine) data centres (DUB14 & DUB15) all to be located west of data centres DUB9, DUB10, DUB12 & DUB13 within the MS Campus.
- The Central Administration Building (c.6.03m to c.19.85m high) will comprise central office administration, with staff cafeteria, staff gym, and reception (GFA c.3,520 sq. m), with provision of PV panels on the roof.
- Each data centre (c.15.6m high to parapet height and c.18.65m to top of roof plant) will include data halls, admin blocks (comprising offices, canteen, loading dock, storage, and ancillary areas) and a variety of mechanical and electrical plant areas/structures including Modular Electrical Rooms (MERs), battery rooms, and transformer areas. GFA of DUB 14 is c. 28,072sq.m. and GFA of DUB 15 is c.28,173 sq.m (c.56,246 sq.m in total).
- DUB14 will also include 21 no. diesel generators and associated sub-stations (E-houses) and 11 no. mechanical flues (each c.30.75m high).
- Provision of a gas generator compound (to serve DUB15) containing 20 no. generators, 5 no. E- houses,

and 5 no. flues (c.25m maximum height).

- Provision of a Gas Networks Ireland gas skid including 3 no. kiosk buildings.
- 2 no. sprinkler tank and pump house areas, 1 no. additional rainwater harvesting plant.
- Provision of 168 no. permanent car parking spaces and 40 no. cycle parking spaces.
- Provision of an additional western access to the MS Campus (to serve the Central Administration Building) from the business park estate road (including bridge over the Griffeen River) with existing temporary access to be extinguished.
- Physical integration with the remainder of the existing MS Campus (including internal access roads and landscaping) with associated modifications to the western boundary of the DUB09/DUB10/DUB12/DUB13 data centre development as permitted under SD16A/0088.
- Provision of a new temporary construction car park (with 802 no. car spaces, shuttle bus stop and shelter) on site north of the main entrance to the business park.
- The total gross floor area of the development will be c.59,766 sq.m
- All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing), and associated works.

In relation to Casement Aerodrome, located c.1.6km to the south, the application site is outside the Department of Defence Security Zone and outside the Inner Approach Areas and Critical Safety Zones where development is restricted. The site is located at the edge of the Department of Defence Inner Zone Limit

The scope of works in the contract provides for the construction of.

- Civil Works
- Completion of the site access road
- Architectural & Structural Works
- Groundwork's
- Mechanical & Electrical Installation
- Soft finishes

Civil, Structural & Building Works

The following construction & civil engineering works will be required.

- Ground disturbance works for new underground services, foundations and piles
- New structural steel supports within the building footprint
- Formation of roof penetrations
- Installation of Plant support systems

- Steel works to generator yard
- Installation of external stairs
- External Fencing
- Installation of external car park furniture, bollards, kerbing-
- external cladding and building envelope
- Internal Building partitions
- External Glazing to Admin areas
- Car Park Marking
- Excavation for underground services
- Hard standing and road finishes

Mechanical & Electrical Works

The following mechanical and electrical engineering works will be required.

Electrical

- Installation of Electrical EHouses
- Installation of Electrical generators
- Installation of MV Equipment
- Installation of Primary Plant containment, subfloor and above ceiling containment
- Installation of Remote Power Panels, Distribution boards and PDU's
- Primary & Secondary Cabling
- Lighting cabling & fittings
- Security controls, sensors and services
- Data cabling
- Testing & Commissioning of Systems
- Installation of internal power distribution and telecoms services with associated controls

Mechanical

- Installation of Air Handling Plant and associated ductwork both external and internal as detailed on the project drawings
- Installation of mechanical pipework, process and humidification
- Supply & Installation of water treatment plant
- Position and Install External Plant

- Ventilation and Fire Dampers as required
- Installation of insulation and cladding to internal/external pipework/ductwork
- Mains/ hot & cold-water services
- Installation of fire protection/ sprinkler services and associated storage

Worker Numbers & Working Hours

It is anticipated that the construction population on site will range from 250 to 400 operatives per shift with a likely peak construction stage figure of c.550.

It is anticipated that the construction of the facility will be completed during normal construction hours although these may extend during peak construction phases. Specific working hours will be agreed with the planning authority.

Construction Phasing

The works will commence in July 2021 is expected to take c.48 months to complete with a number of construction phases anticipated.

- Commence Enabling Works – July / August 2021
- Commence Site Construction works–September 2021
- Complete Construction Works – Sept 2024

Construction Parking

Construction worker parking (totalling 802 spaces) is to be provided in a dedicated temporary parking site within the Business Park. This temporary construction car park will connect with the development site for DUB 14/15 by means of a shuttle bus service operating during shift change over times and designated time periods for specialist construction operatives that are allocated specific times for implementing their section of the project delivery.

The travel distance between the temporary construction car park and the construction site is less than 5 minutes by shuttle bus.

Site Preparation

A contractor's compound will be established for the construction of the overall development. The compound will provide offices, portable sanitary facilities, equipment storage, etc for contractors for the duration of the works. The construction compound will be fenced off for health and safety reasons so that access is restricted to authorised personnel only. The compound will be moved progressively as phases of the development are completed.

Site access roads, along with some site clearance have already been completed as part of construction of DUB09/ DUB10/ DUB12 /DUB13. During the initial works required for the current proposal further vegetation clearance, surveying and setting out for structures, rerouting of etc will be required.

In advance of site preparation works, a strategy will be developed in order to efficiently move material arising from excavations to locations where landscaped berms are required around the facility. The sequence will start with clearance of the critical areas including the site access routes,

contractor's compound etc. A combination of bulldozer, excavators, trucks and other soil shifting plant will then commence the main site vegetation clearance and cutting and filling aspect.

3. ENVIRONMENTAL CONTROL MEASURES

3.1 Dust Control and Air Quality

The following measures are to be implemented on site to minimise dust emissions:

- Where soil stripping occurs the resulting soil fraction should be separated into topsoil and subsoil stockpiles
- The temporary storage of spoil is to be managed in terms of spoil height and location to prevent release of windblown dust
- All construction trafficked areas are to be dampened down by water spraying etc
- A wheel wash will be installed. This will be used during wet weather to prevent the drag of material on the under carriage of vehicles
- Local roads used by construction traffic will be continuously monitored, cleaned and maintained as appropriate to ensure that any excess material carried off site is removed immediately
- Any unsurfaced roads within the site will be restricted to essential site traffic only
- A site speed limit of 15 kph will be in place on site. Adherence to this speed limit will prevent the unnecessary generation of fugitive dust emissions.
- Bowsers or mist generators shall be used during dry weather or other periods at potential dust sources

The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of dust produced will be deposited close to the generated source.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented.

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only;
- If required, any area/road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. Indeed, on any un-surfaced site road, this will be 15-20 kph, and on hard surfaced roads as site management dictates;

- In dry conditions vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Wheel washing facilities will be provided for vehicles exiting the site in order to ensure that mud and other wastes are not tracked onto public roads;
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary;
- At all times, these procedures will be strictly monitored and assessed. In the event of dust emissions occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to bedeposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. Itis expected that climatic emissions from truck movements and the operation of generators and machinerywill not be significant

In order to ensure that no dust nuisance occurs, a series of measures will be implemented. In summary,the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimiseexposure to wind. Water misting or sprays will be used as required if particularly dusty activities arenecessary during dry or windy periods.
- During movement of materials both on and off-site, trucks carrying potentially dusty material will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will beadequately inspected to ensure no potential for dust emissions.
- At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

- Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term and temporary nature of these works the impact on climate will not be significant.

3.2 Noise & Vibration

The construction phase will create a large construction site with short to medium term impact on the immediate local environment and the amenity of existing residents as a result of noise and disturbance from construction and construction traffic.

Winthrop will ensure construction works shall be carried out, such that no noise nuisance is caused to local neighbours and facilities. It is not anticipated that any activity at the site will result in significant vibration nuisance. Noise monitoring will be conducted on site against the following limits (National Roads 2004)

Any activity that is known to result in a significant increase in ambient noise levels or increase vibration shall notify the HSE manager in advance. To minimise noise, equipment specification will include (for example):

- Stringent equipment sound power levels (the noise level at full load shall not exceed 85dBA when measured at a distance of three feet from the equipment surface in any direction)
- Acoustic cladding, enclosures and barriers

Any noisy or malfunctioning vehicles and equipment shall be repaired in a timely manner or removed from the site as early as possible. No equipment or machinery (to include pneumatic drills, construction vehicles, generators etc) shall operate on or adjacent to the construction site before 07.00 hours on weekdays and 09.00 hours on Saturdays nor after 19.00 hours on weekday and 13.00 on Saturdays, nor at any time on Sunday.

With regard to construction activities, reference will be made to BS5228: Noise control on construction and open sites, which offers detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures can be considered and applied during the construction of the proposed development, such as:

- limiting the hours during which site activities are likely to create high levels of noise are permitted, e.g. soil excavations.
- monitoring typical levels of noise during critical periods and at sensitive locations.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include:

- selection of plant with low inherent potential for generation of noise.
- erection of barriers as necessary around items such as generators or high duty compressors, and;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints.

The proposed general construction hours are 07:00 to 18:00hrs, Monday to Friday and 08:00 to 14:00hrs on Saturdays. Occasional weekday evening and night works may also be required, however evening activities will be significantly reduced in order to manage any associated noise impacts in an appropriatemanner and a more stringent construction noise criteria will be applicable during any evening works thatmay be required. As a result, noise

emissions from evening activities are expected to be significantly lower than for other general daytime activities.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the distance of any sensitive locations to the site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

There are no items of plant that would be expected to give rise to noise levels that would be consideredout of the ordinary or in exceedance of the levels outlined in the above tables or give rise to a potential significant impact. The impact on the noise environment due to construction activities will be transient and short-term in nature and mitigation measures will be implemented to minimise the impact of construction activities on the noise environment.

With regard to construction activities, reference has been made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be considered and applied during the construction of the proposed development. As an example, the following measures will be implemented on site:

- limiting the hours during which site activities likely to create high levels of noise or vibration arepermitted;
- establishing channels of communication between the contractor/developer, Local Authority andresidents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring levels of noise and/or vibration during critical periods and at critical sensitivelocations; and
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed, such as:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around items such as generators or high duty compressors;
- situate any noisy plant as far away from sensitive properties as permitted by site constraints andthe use of vibration isolated support structures where necessary.
- Soil to be separated into topsoil and subsoil stockpiles
- Temporary storage of spoil to be managed (in terms of spoil height and location) to prevent release of windblown dust
- All Construction trafficked area to be dampened down by water spraying as required
- Wheel washes to be installed to prevent the drag out of material on the under carriage of vehicles

- Local roads used by construction traffic to be continuously monitored, cleaned and maintained as appropriate to ensure that any that any excess material carried off site is removed immediately
- On-site speed restrictions (15kph) will be implemented in order to prevent the unnecessary generation of fugitive dust emissions

3.3 Hydrogeology and Drainage

Site Management recognise the site is in close proximity to the Griffeen River and will take the necessary measures to prevent the release of pollution or silt into the river.

Welfare facilities will be provided for the operatives on site during the construction works. These facilities will be connected to the existing foul drainage system on site or portable sanitary facilities will be provided until the drainage system is established.

Any surface water run-off collecting in excavations will be pumped from the excavation and treated by use of suitably sized grit chambers and a 3 chamber Class I hydrocarbon interceptor prior to discharge to the Local Authority surface water drainage network in compliance with the requirements outlined in the planning submittal.

Site management will ensure the following control measures are put in place

- Winthrop will acquire a specialist archaeologist and Arborist where required.
- A methodology and control measures will be taken to prevent the release of silt and pollution during the construction stage such as a silt fence etc.
- In order to minimise the alteration of the site topography, the site to be graded in order to promote run off and reduce ponding of water.
- To prevent contamination of surface water and ground water, uncontrolled surface water run off from soil stockpiles will be prevented through the use of bunds, mounds and drainage where required
- Refuelling and minor servicing of plant and machinery to be confined to designated and suitable protected areas
- Major servicing of plant and machinery to be conducted off site to prevent any contamination of surface and ground water
- All oils, solvents and paints used during construction to be stored within temporary bunded area
- Excavated soil will be separated into topsoil and subsoil stockpiles to prevent loss of fertility of topsoil. The topsoil will be reused during landscaping operations
- In relation to flooding it is noted that a Site Specific Flood risk Assessment has been carried out and is detailed in the EIAR Chapter 7 (Water Services). The assessment concludes that the site is not at risk of flooding and with the proper attenuation provided will ensure that flood risk to other lands upstream or downstream of the development is minimised.

- The proposed development is located within the Eastern River Basin District (ERBD). The most significant drainage system in the vicinity of the subject site is The River Griffeen.
- The temporary car parking site (Site B) currently does not have any drainage infrastructure installed. As this is a temporary car parking surface it is not proposed to install any drainage infrastructure in this site. All finishes will be permeable.

The key civil engineering works at the proposed development will involve the excavation of material for foundations and deliveries of imported engineering fill, crushed stone, concrete, reinforcement and other construction materials. Other construction activities will include site storage of cement and concrete materials, oils and fuels. The potential impacts in relation to water have been assessed under the following headings:

- Increased runoff and sediment loading
- Contamination of local water courses
- Increased Runoff and Sediment Loading

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- Spillage or leakage of oils and fuels stored on site.
- Spillage or leakage of oils and fuels from construction machinery or site vehicles.
- Spillage of oil or fuel from refuelling machinery on site.
- The use of concrete and cement

Machinery on site during the construction phase may result in contamination of the surface water. The potential impacts could derive from accidental spillage of fuels, oils, paints and solvents, which could impact surface water and groundwater quality if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses.

Concrete operations carried out near surface water bodies during construction activities could lead to a discharge of wastewaters to a watercourse.

Works associated with the temporary car parking area (Site B), are adjacent to the Grand Canal. The existing 50m setback which includes a planted buffer will not be impacted by the development.

During the construction phase the mitigation measures will ensure that no sediment contamination, contaminated runoff or untreated wastewater will enter any watercourses during the construction of the proposed development.

Increased Runoff and Sediment Loading

During the construction phase any drains carrying a high sediment load will be diverted through the settlement ponds. The settlement ponds will be located between the area of construction and the nearest field drain. Surface water runoff will not be discharged directly to local watercourses.

A drainage plan has been drawn up and submitted. The drainage system and settlement ponds will be constructed as a first step before major site clearance activities occur.

Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise potential for groundwater ingress into excavations.

Silt traps will be placed in the existing drainage network around the site to minimise silt loss. These should be inspected and cleaned regularly.

Weather conditions will be taken into account when planning construction activities to minimise risk of run off from the site.

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents, paints and fuels used during construction will be stored within temporary bunded areas and each of these areas will be bunded to a volume of 110% of the capacity of the largest tank/container within it (plus an allowance of 30 mm for rainwater ingress). Filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) will be diverted for collection and safe disposal.

No concrete batching facility will be required at the site. All concrete will be brought to site by truck. Wet concrete operations adjacent to watercourses will be avoided where possible. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to groundwater.

provision for removal of any concrete wash waters, most likely by means of tankering off-site and no such wash waters will be discharged to groundwater.

Any effluent generated by temporary onsite sanitary facilities will be taken off-site for appropriate treatment.

Some construction works on site may take place in the vicinity of watercourses in the riparian zone. A buffer area will be established to protect the riparian and aquatic zones from disturbance. The buffer area generally extends beyond the riparian zone. The width of a buffer area will be determined by the guidance set out by the Department of the Marine and Natural Recourses15, which are shown in Table 7.4:

Average slope leading to aquatic zone	Buffer zone width on each side of the aquatic zone	Buffer zone width for highly erodable soils
Moderate (even to 1in 7 / 0- 15%)	10 m	15 m
Steep (1 in 7 to 1 in 3 / 15-30%)	15 m	20 m
Very steep (1 in 3 / >30%)	20 m	25 m

Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/ equipment will take place in designated bunded areas where possible. Re-fuelling will be avoided in so far as possible at the other work sites but where necessary will take place within appropriately bunded areas at a designated distance away from watercourses (>10m).

If it is not possible to bring a machine to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. The vehicles and equipment will not be left unattended during refuelling. Spill kits and hydrocarbon absorbent packs will be stored in the cab of each vehicle and operators will be fully trained in the use of this equipment.

The generation of runoff from stockpiles of soils, excavated during construction, will be prevented from entering watercourses by diverting runoff to the settlement ponds on site, and removing the material off-site as soon as possible to designated storage areas.

3.4 Flora & Fauna & Biodiversity

In relation to Biodiversity it is noted that all works will be carried out in compliance with

- EU Habitats Directive
- EU Birds Directive
- Wildlife Acts (1976 - 2012)

Habitats

Specific local mitigation measures include the avoidance of cutting of vegetation during the bird nesting season will be deployed with regard to the construction phase.

Appropriate mitigation measures will be employed with regard to water quality and the protection of the Griffeen River during all aspect of construction.

A new access to the main data centre site will be facilitated by the placement of a clear span bridge. Significant effects on the Griffeen River could be considered in terms of local effects on water quality form elevated suspended solids or hydrocarbon pollutants potentially entering the river during construction work.

Specific measures will include maintaining the buffer zone of no development in areas outside the specific water course crossing and the protection of water quality during the access bridge construction and placement works to avoid elevated suspended solids being washed downstream.

Standard measures for the protection of fisheries will be included in the CMP per the IFI Guidelines (IFI, 2016)3.

Silt curtains will be placed along the upper bank along the river bank to prevent siltation of the Griffeen River during the bridge installation. The works area will be fenced with Terram or equivalent geo-textile fencing, secured to the ground to prevent the wash-out of suspended solids from the site to the open channel. Where possible, this will be set back from the riparian corridor of the water course to allow the retention of a buffer-zone of riparian vegetation along the channel.

There will be no stockpiling of spoil within 10m of the upper level of the river banks.

No bats were recorded roosting in the buildings to be demolished. The hedgerows on site have few features that would act as potential roosting sites.

The area of the proposed temporary car park is surrounded by access roads which are lit by street lamps located between 5 and 15m of the corridor and the proposed car park will not add to the

existing level of lighting. Therefore there will be no significant effect on bats commuting in the Grand Canal corridor.

All chemicals and hydrocarbons will be stored away from the river.

Concrete pouring will be restricted in the proximity of the open channel within and adjacent to the site.

Washing out of concrete vehicles on site will be prohibited as they are the greatest potential source of high alkalinity in watercourses. Consequently, it is a requirement that all concrete vehicles washout takes place off site.

Potential impacts on nesting birds will be avoided by timing the cutting of vegetation as required by the Wildlife Acts.

Bat friendly lighting with 0-3lux in the outer spill area of the proposed temporary car park will be employed, including design features such as directional cowls to direct the light into the car park area and away from the Grand Canal corridor.

The following guidance documents will be followed

IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters

CIRIA, 2001. Guidance Document C532 Control of Water Pollution from Construction Site: https://www.ciria.org

The CMP will be updated in consideration of standard best practice and, as expanded on by the contractor, will align with the guidance set out in the following documents:

CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001)4; and

CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004)5; and

CIRIA (2015) Environmental Good Practice on Site C692 (4th Edition) (C762)6.

- During Construction, care will be taken to protect the trees on site from both direct and indirect disturbance
- In the event of any identified habitats on site, site management will consult with specialist and take the appropriate actions such as fencing off the area etc
- Standard engineering measures will be employed to prevent potential pollutants from entering the water course in close proximity to site
- Cutting, grubbing etc of vegetation growing on uncultivated land in hedges or ditches during the nesting and breeding. If required, the removal of hedgerows will be completed outside of breeding season (1st March to 31st August) unless the site qualifies for an exemption under Section 40 of the Wildlife Act 1976 as amended by Section 46 of the Wildlife (Amendment) Act 2000 and agreed with the National Parks and wildlife services

3.4 Earthworks

Materials Sourcing, Transportation & Storage

Key materials will include steel, concrete, glass, composite cladding, piping, electrical cabling, process equipment and architectural finishes. A 'Just in Time' delivery system will operate to minimise storage of materials on site.

Where possible it is proposed to source general construction materials from the Dublin area to minimize transportation distances.

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage.

Construction materials will be brought to site by road. Construction materials will be transported in clean vehicles. Lorries / trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway.

Building Construction Works

Foundations and Structure

Following the completion of site levelling, all structures will require deep concrete pad foundations. Building structures will comprise structural steel frames with concrete floors on metal decks.

Cut and Fill

It is envisaged that all spoil generated during site preparation will be re-used in the landscaping and levelling of the site where possible. In the worst case scenario i.e. construction during a period of extended poor weather, a quantity could require removal.

Contractors will be required to submit and adhere to a method statement indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

Where stripping occurs, the resulting excavated fractions will be separated into subsoil and topsoil stockpiles. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

Roads, Services and Landscaping

The internal road system will initially be comprised of hard cored material, rolled and compacted sufficiently to support initial construction including civil/structural sub grade works.

An extensive programme of soft and hard landscaping will be undertaken in stages throughout construction works. An early phase of landscape planting will be undertaken following the initial cut and filling works to include planting of trees in selected sensitive areas. Early growth and development in these areas will promote a good screening of construction works into operational phase.

Earthworks

Excavation and Infilling: Excavation and infilling of soil and near-surface rock head will be required for levelling of the site to render it suitable for building the building platform. Where appropriate excavated material will be reused on site for infilling and landscaping works. Site investigation and laboratory analysis will identify any material which required specific treatment or landfill requirements and the necessary Waste Acceptance Criteria will be applied and implemented.

if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor.

During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Spillage or leakage of oils and fuels stored on site.
- Spillage or leakage of oils and fuels from construction machinery or site vehicles.
- Spillage of oil or fuel from refuelling machinery on site.
- Spillage of concrete and cement during pad foundation construction.

Accidental spillages may result in contamination of soils and groundwater underlying the site,

Surface Water Runoff: Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to The River Griffeen and groundwater underlying the site particularly if it is contaminated. Silt water can arise from exposed ground and soil stockpiles (prior to reinstatement).

Construction Phase

Works associated with the temporary car parking area (Site B), are adjacent to the Grand Canal. The existing 50m setback which includes a planted buffer will be retained and will not be impacted by the development. The Grand Canal is elevated above Site B and therefore contamination of this watercourse is not considered.

On completion of the development at site A, the temporary car parking facility at Site B will be made redundant and lands will be reinstated to the original landscaped profile. Surface water runoff will continue to percolate and drain as per existing site conditions.

Construction Phase

Soil Removal and Compaction: Construction works will require removal of soil cover where levelling of the site is required

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.

Fuel and Chemical Handling: To minimise any impact on the surrounding environment and underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity

of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off the site) which will be away from surface water gullies or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank.

An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. The pouring of concrete will take place within a designated area to prevent concrete runoff into the soil/groundwater media. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite. In the case of drummed fuel or other chemical which may be used during construction containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Surface Water Runoff: Water containing silt will be treated to ensure silt removal prior to disposal to disposal to storm water sewer.