Planning Engineering Report
ESB Substation SID

10360452-HDR-XX-00-RP-C-000001

Herbata Data Centre Campus

Naas, County Kildare
November 12, 2025

Prepared By: HDR & Donnachadh O'Brien Associates
Edited By: Richard Kiernan DOBA
Authorised By: Ulrich Groenewald HDR
Issue: P08
Status: Final

Document Control

Issue	Date	Status	HDR Author ([XX/XX/XX].[Initials])	HDR Approval ([XX/XX/XX].[Initials])	Notes
P01	12/07/2023	Draft 1	HDR & Donnachadh O'Brien	JM	Stage 2 Engineering Design
P02	07/09/2023	Draft 2	HDR & Donnachadh O'Brien	JM	Stage 2 Engineering Design
P03	07/06/2024	Draft 3	HDR & Donnachadh O'Brien	UG	Stage 2 Engineering Design
P04	28/06/2024	Draft 4	HDR & Donnachadh O'Brien	UG	Stage 2 Engineering Design
P05	18/07/2025	Draft 5	HDR & Donnachadh O'Brien	UG	Stage 2 Engineering Design
P06	14/08/2025	Draft 6	HDR & Donnachadh O'Brien	UG	Issued for Planning
P07	20/08/2025	Draft 7	HDR & Donnachadh O'Brien	UG	Issued for Planning
P08	12/11/2025	Final	HDR & Donnachadh O'Brien	UG	Issued for Planning

Contents

Tables

Figures

Appendices

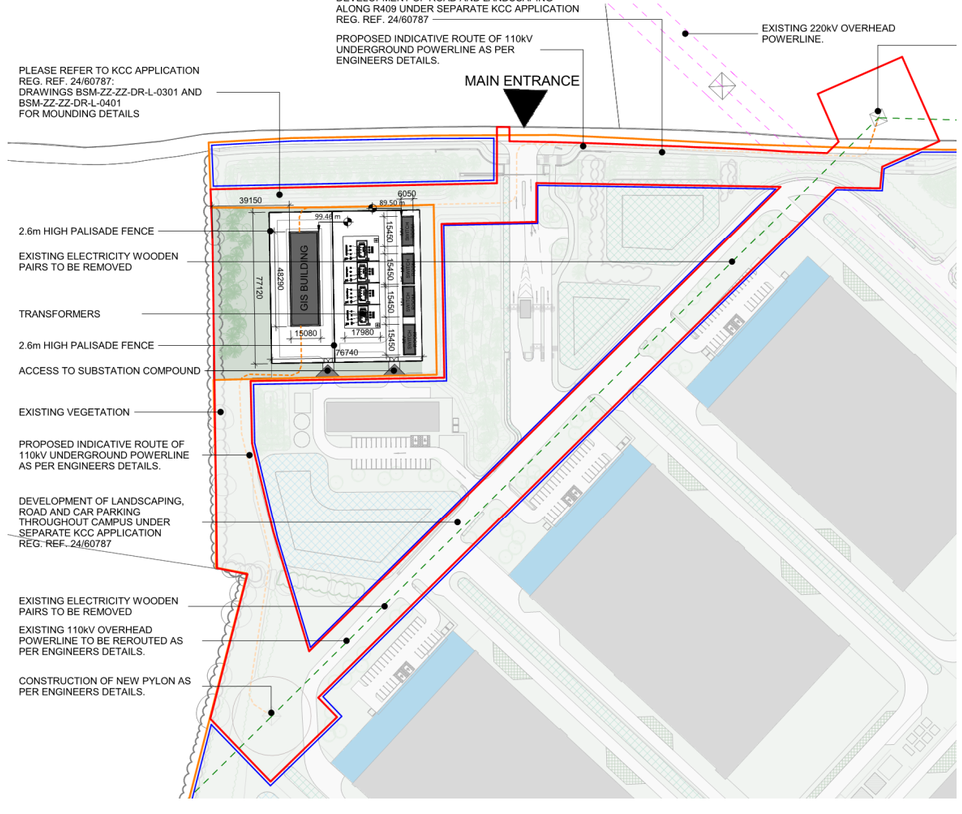
This page is intentionally left blank.

1 Introduction

This report has been prepared by Donnachadh O'Brien & Associates, Consulting Engineers, in support of the Strategic Infrastructure Development (SID) application for the proposed ESB Substation of the Herbata Data Centre Campus development to be constructed on lands at Halverstown, Naas, County Kildare. The subject lands are located on the western side of the M7 motorway, positioned between Junctions 9a and 10. The site is bound to the north by the R409 road which provides a direct link to the centre of Naas, approximately 2.5km to the east. The site is bounded to the east, west and south by agricultural lands. The agricultural lands to the east and south are the location of the proposed Herbata Data Centre Campus which is subject to a separate planning application to Kildare County Council (Ref:24/60787/ ACP Ref:*323677*).

The proposed development comprises a new electricity grid substation compound, a medium voltage switchgear and control equipment building, a building housing indoor high voltage (HV) gas insulated switchgear (GIS) equipment, high voltage busbar connections, and step-down power transformers, and underground cables connecting the proposal to the existing 110kV overhead lines that cross the proposed development site. It also includes landscape & boundary treatment works including mounding, hedgerow protection areas and security.

Figure 1-1. Proposed Substation Site Layout within Herbata Data Centre Campus



This report outlines the proposed engineering infrastructure for the development works under the following areas:

- Surface Water Drainage
- Foul Water Drainage
- Water Supply
- Roads Infrastructure (Access)

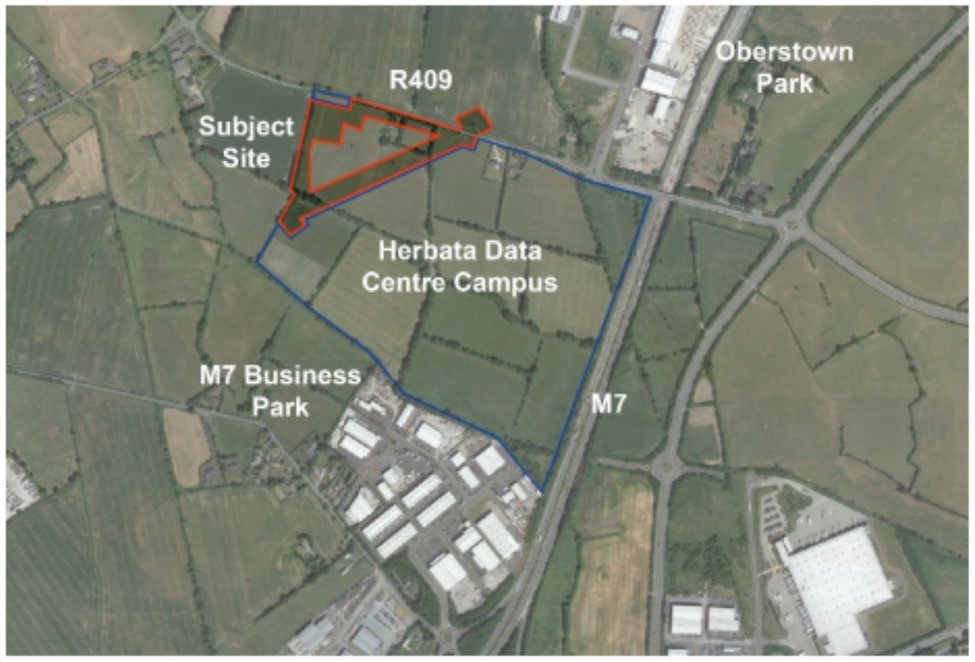
This report should be read in conjunction with the engineering drawings submitted in support of the planning application. Refer to the drawing register sheet in Appendix A.

2 Existing Site

The site, shown in the Figure 2 1 below, is located approximately 2.5km to the west of Naas town center in County Kildare. The site is bounded to the east, west and south by agricultural lands. The agricultural lands to the east and south are the location of the proposed Herbata Data center Campus which is subject to a separate planning application to Kildare County Council.

The overall red line boundary comprises approximately 3.15 hectares for the SID application. The subject site currently consists of agricultural lands to the west of the M7 and Naas town. This does not include the Data Centre Campus which forms part of a separate planning application. The site in level varies between +85.500m AOD and +81.0 AOD, and slopes generally from Northeast to Southwest.

Figure 2-1. Existing Site Layout (Source - Google map extract)

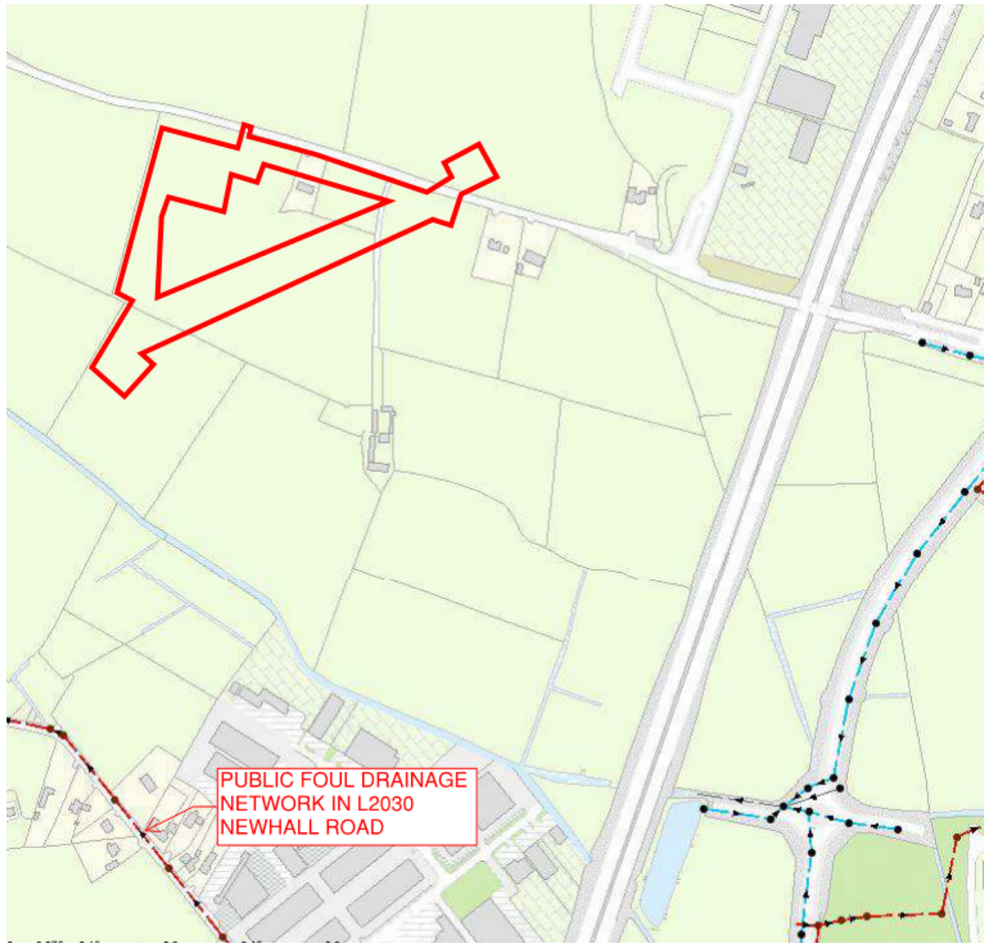


3 Existing Drainage and Water Supply Services

3.1 Existing Drainage

The existing site is not served by any public or formal surface water or foul water drainage network, as is illustrated in Figure 3-1 below which is an extract from the available Kildare County Council / Uisce Eireann public drainage mapping.

Figure 3-1. Extract from Uisce Eireann Drainage Mapping



The nearest public foul drainage network is located approximately 275m to the south of the site and runs along the L2030, Newhall Road. Uisce Eireann mapping indicates that there is an existing 300mm public drainage infrastructure to the south of the site which conveys flows along the L2030 Newhall Road. Flows are conveyed to the existing Newhall Wastewater Pumping Station which is located to the west of the proposed site as seen in Figure 3-2.

Flows from the Newhall Wastewater Pumping station are pumped via rising main to the Osberstown Wastewater Treatment Plant to the north of the site.

Figure 3-2. Existing Foul Drainage Network in L2030 / Pump Station

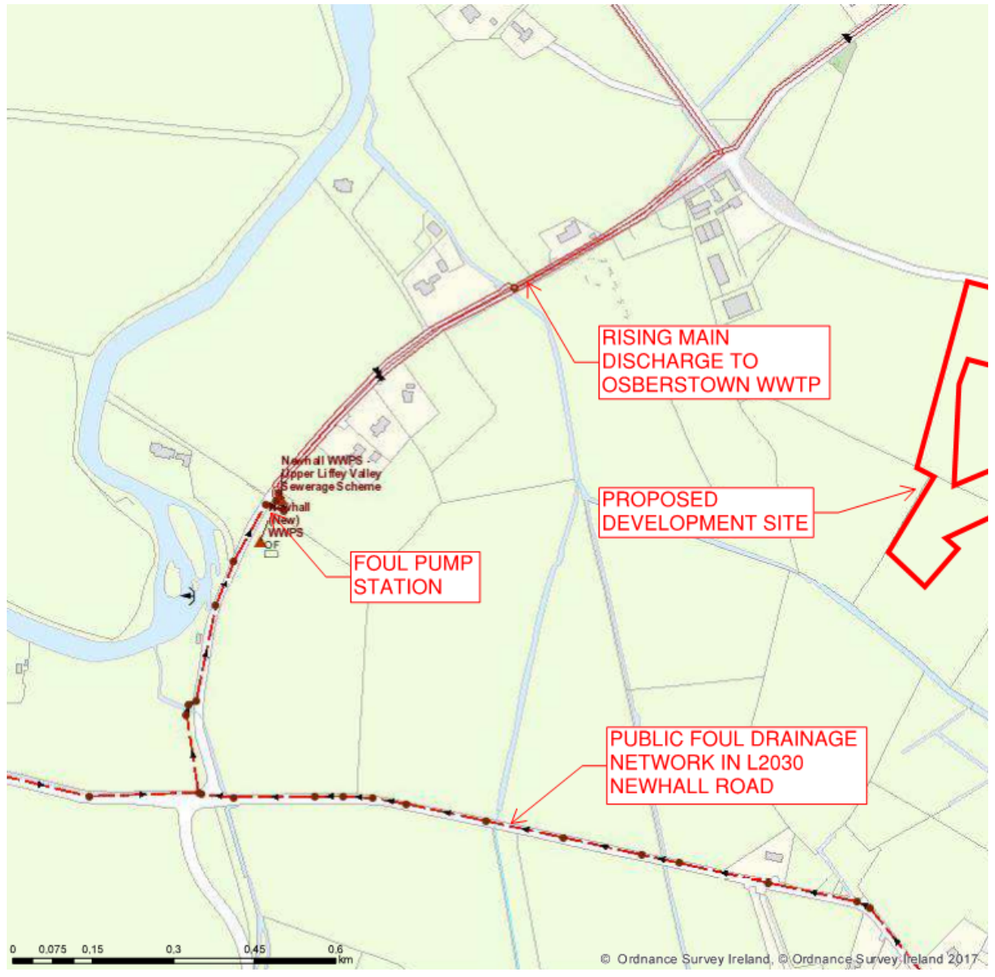
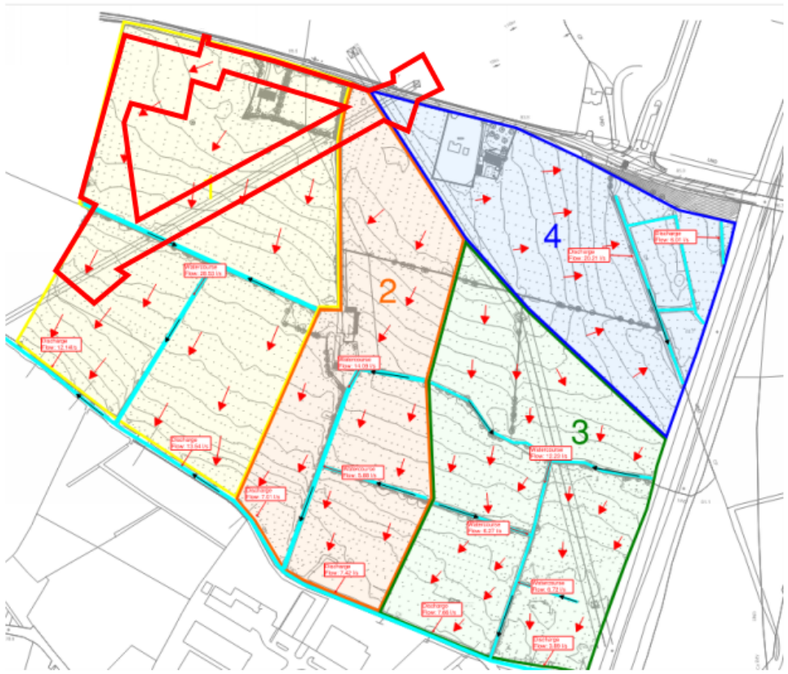


Figure 3-3 below indicates the extent of the existing field boundaries and existing ditches of the proposed substation site and adjoining agricultural lands. For the purposes of the surface water management design, we have identified below the existing discharges and the natural sub-catchments on the site. The proposed substation SID lies predominately within Catchment 1. Currently surface water from rainfall on the subject site flows across the land and is collected in several ditches which traverse the adjoining agricultural lands and discharge into the Bluebell Stream (also known as the Yeomanstown watercourse) which runs in a northwest direction along the southern boundary of the adjoining agricultural lands.

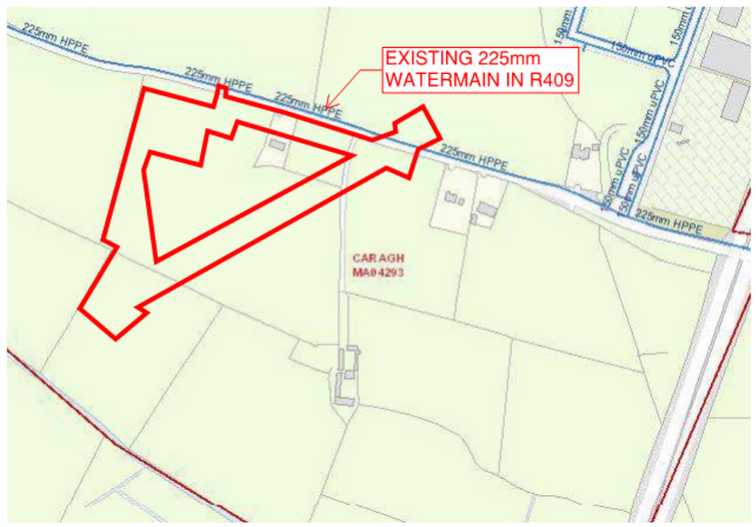
Figure 3-3. Existing Overland flow paths and Catchment areas of agricultural lands.



3.2 Existing Water Supply

The Uisce Eireann (UE) record drawings indicate the presence of a 225mm diameter HPPE watermain to the north of the site along the R409 as illustrated in Figure 3-4 below. The location of the watermain was verified following a Ground Penetrating Radar (GPR) survey of the existing site and adjacent roads which was commissioned by the Applicant.

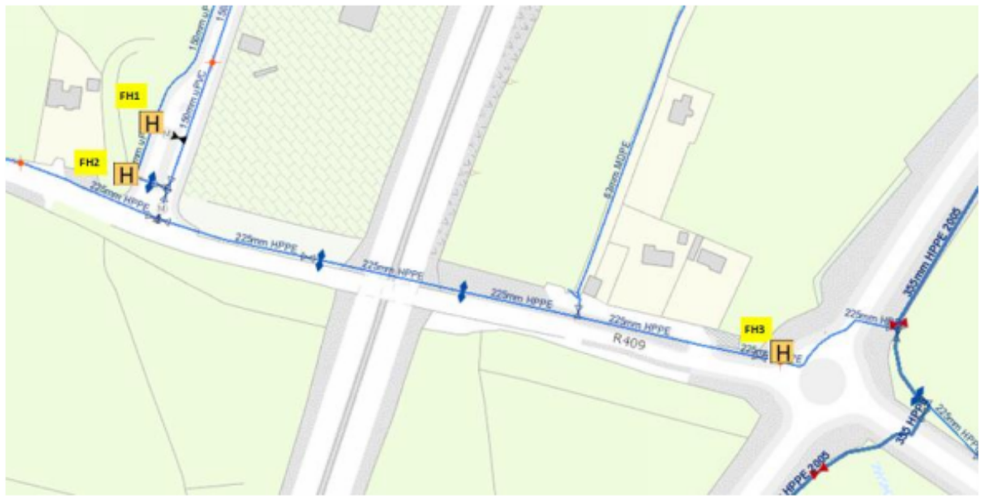
Figure 3-4. Existing Watermain Location



3.2.1 Pressure Testing

The Applicant commissioned SES Water Management to carry out Fire Flow Simulation Testing on the nearest existing hydrants to the site. The hydrant was pressure logged for a period of 7 days which determined that the existing flow rate is approximately 26 l/s. The Pressure Testing Report is included in Appendix F of this report.

Figure 3-5. Extract from Hydrant Pressure Testing Report – Hydrant Locations and Test Results



FH No.	Surface	Cover / Frame	Pit	Type	Depth	Marker / Plate	Canary Yellow	Spindle	Operating	Comments
1	Grass	Poor	Good	LUG	290	Yes	No	Good		No Plinth
2	Grass	Poor	Good	LUG	370	Yes	No	Missing		No Plinth
3	Grass	Poor	Good	LRT	520	Yes	No	Good		No Plinth

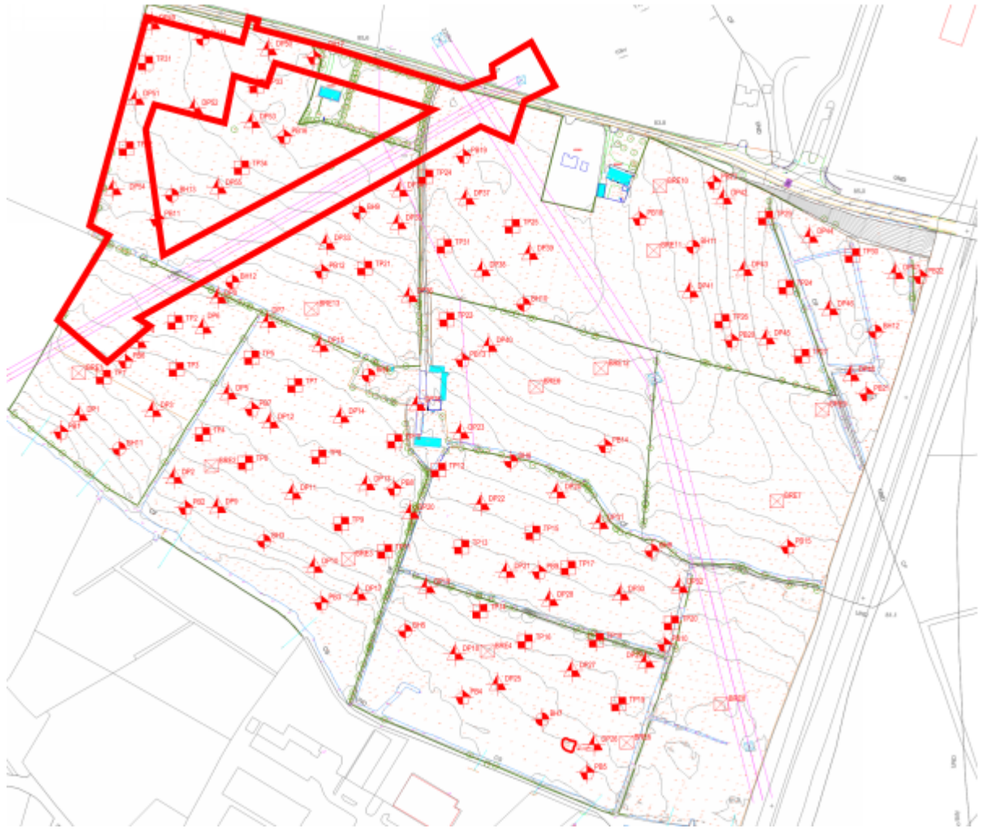
4 Proposed Surface Water Drainage

4.1 Existing Ground Conditions - Site Investigation

A suite of ground investigations, refer to Appendix B, has been carried out on the overall site by IGSL Ltd. which includes the following;

- Cable Percussive Boreholes
- Trial Pits
- BRE365 Soakaway Tests
- Dynamic Probes
- Plate Bearing Tests
- Ground Water monitoring
- Geotechnical Laboratory Testing

Figure 4-1. Extract from Site Investigation – S.I. Locations Layout.



In summary the results of the ground investigations yielded the following findings:

- The underlying strata consists of predominately silty/sandy gravelly CLAYS.
- Ground water monitoring was carried out by IGSL during the site investigation, over a 6-month period. Water strikes (seepage, slow and moderate inflows) were intercepted during shallow trial pit excavations, with groundwater also struck during borehole construction at BH01, BH02, BH04 and BH12. A well installed in BH13 later reported water. Except for TP30 and BH12 in the northeast, shallow groundwater was found towards the south of the site, near the stream boundary. For the most part the groundwater entries were reported as seepages in trial pits, frequently in gravel horizons at the base of trial pits at circa. 3.0m depth. Refer to section 5.3 of IGSL report in Appendix B.
- BRE365 soakaway testing yielded variable results across the site with poor infiltration rates to the south of the site and poor to moderate infiltration in some of the northern portions of the site with rates of approximately 5x10-6 m/s being determined (see Figure 4-2 below).

Disposal of surface water run-off to ground via infiltration will vary across the site with infiltration generally not practical across the central and southern portion of the site for significant surface water disposal. Some surface water infiltration is feasible along the northern boundary, adjacent to the R409 road.

Figure 4-2. Extract from Site Investigation – BRE 365 Infiltration Testing

Soakaway Design f -value from field tests (F2C) IGSL

Contract: Halverstown Contract No. 24330
Test No. SA06 (Cycle 1)
Client DOBA
Date: 10/10/2022

Summary of ground conditions

from	to	Description	Ground water
0.00	0.40	TOPSOIL: Soft brown sandy CLAY with rootlets. Sand is fine to	Dry
0.30	1.20	Firm brown sandy gravelly CLAY. Sand is fine to coarse. Grave	
1.20	2.00	Grey brown gravelly silty SAND with a low cobble content. Sanc	

Notes: Samples: AA181953
AA181954

Field Data

Depth to Water (m)	Elapsed Time (min)
1.12	0.00
1.13	1.00
1.14	2.00
1.14	3.00
1.15	4.00
1.15	5.00
1.16	6.00
1.16	7.00
1.17	8.00
1.17	10.00
1.17	12.00
1.18	14.00
1.18	16.00
1.18	18.00
1.19	20.00
1.19	25.00
1.19	30.00
1.20	35.00
1.20	40.00
1.21	50.00
1.22	60.00

Field Test

Depth of Pit (D)	2.00	m
Width of Pit (B)	0.45	m
Length of Pit (L)	1.60	m
Initial depth to Water =	1.12	m
Final depth to water =	1.22	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.72	m2
*Av. side area of permeable stratum over test pe	3.403	m2
Total Exposed area =	4.123	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

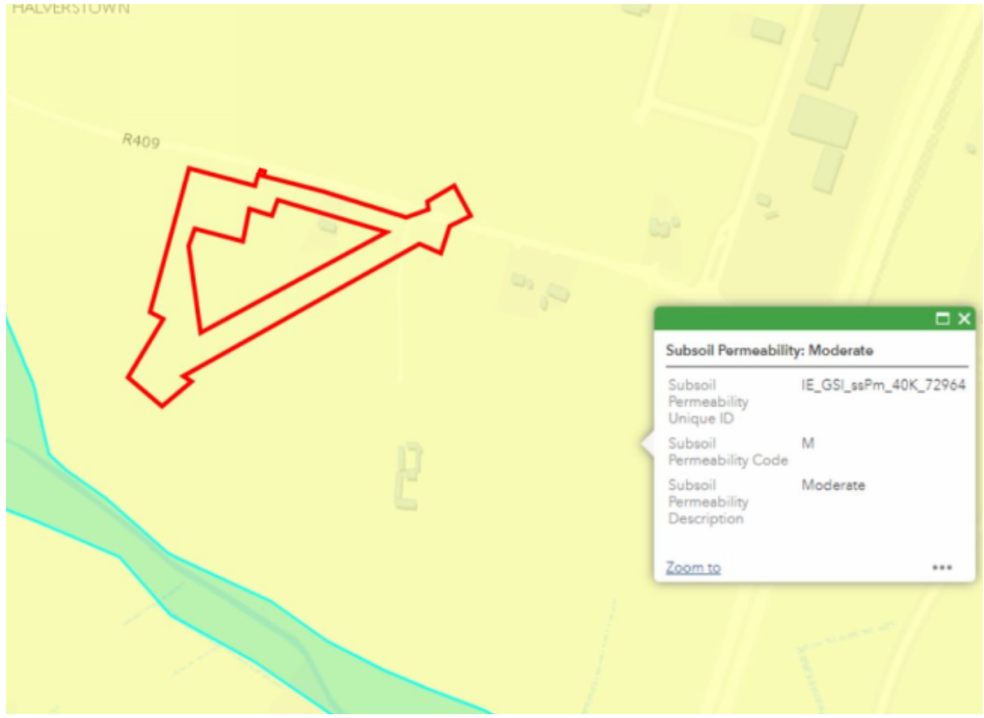
f= 0.00029 m/min or 4.851E-06 m/sec

4.2 Estimation of Greenfield Runoff Rate

4.2.1 Soil Classification

As part of the Site Investigation carried out and discussed in section 4.1 of this report above, the site comprises of predominantly silty/sandy gravelly clays with poor infiltration rates to the south of the site and poor to moderate infiltration in some of the northern portions of the site with rates of approximately 5x10-6 m/s being determined. Figure 4 3 below is an extract from the GSI website which indicates that the subsoil infiltration capacity for the site is ‘MODERATE’. Which is reflected in the IGSL site investigation conducted.

Figure 4-3. Extract from GSI Website indicating subsoil infiltration capability.



An extract from the TII publication DN-DNG-03064 (Drainage of Runoff from Natural Catchments) is shown below in Figure 4 4. This outlines the criteria for each soil type given their runoff potential. Therefore, with the Runoff potential being determined as moderate, A soil Type 3 for the Greenfield Runoff rate is deemed appropriate.

Figure 4-4. Extract from TII Publication DN-DNG-03064.

General soil description	Runoff potential	Soil class
Well drained sandy, loamy or earthy peat soils Less permeable loamy soils over clayey soils on plateaux adjacent to very permeable soils in valleys	Very low	S_1
Very permeable soils (e.g. gravel, sand) with shallow groundwater Permeable soils over rocks Moderately permeable soils some with slowly permeable subsoils	Low	S_2
Very fine sands, silts and sedimentary clays Permeable soils (e.g. gravel, sand) with shallow groundwater in low lying areas Mixed areas of permeable and impermeable soils in similar proportions	Moderate	S_3
Clayey or loamy soils	High	S4
Soils of the wet uplands: Bare rocks or cliffs Shallow, permeable rocky soils on steep slopes Peats with impermeable layers at shallow depth	Very high	S_5

In accordance with the IH24 method, the greenfield runoff for existing undeveloped sites measuring less than 50Ha can be estimated adopting the following formula and the total permissible outflow has been calculated in Table 4-1 below. Further details of Qbar calculations are included in 7.3Appendix C C.

$$Qbar_{rural}(m^3/s)=0.00108x(Area)^{0.89}(SAAR)^{1.17}(SOIL)^{2.17}$$

Table 4-1. Estimation of Greenfield Runoff Rate (Qbar)

Standard Average Annual Rainfall (SAAR)	848	mm
Soil Index	0.47	
Total Site Area	0.6	Hectares (ha)
Total Analysed Area	0.6	Hectares (ha)
Storm Return Period	100	Years
Permissible Outflow per hectare, QBAR	6.0	l/s/ha
Total Permissible Outflow	3.63	l/s

4.3 Proposed Surface Water Strategy

The proposed Surface Water Drainage Strategy is based on applying GDSDS and SuDS best practice to provide an effective drainage design that maximises sustainability and promotes Nature-based solutions for the management of surface water run-off from the post development site.

Due to the BRE 365 soakaway testing results across the site (as outlined in section 4.1 above) the opportunities for the inclusion of significant infiltration-based surface water management are limited and it is not considered a suitable solution for the site in general, although advantage will be taken of infiltration where possible. Attenuation of SW runoff from the Substation shall be provided within the Substation site.

Due to the nature of the proposed development the opportunity for the inclusion of nature-based SUDS solutions and landscaping within the substation development is limited, however, runoff from the roof and hardstanding areas shall be directed into filter drains in the gravel areas of the site to take advantage of any infiltration that may be available. The site will have large areas of gravel / crushed stone surfacing which will allow rainfall to permeate directly to ground across a large portion of the proposed substation. The filter drains will convey excess runoff from the site to the discharge point at the south of the Substation site.

It is proposed to discharge collected SW runoff from the Substation site at Qbar rates to the existing Bluebell Stream, via the Surface Water Drainage infrastructure of the proposed Herbata Data Centre Campus (Application Ref:24/60787/ ACP Ref:*323677*), the extent of which is indicated on drawing 2232-DOB-ZZ-ZZ-DR-C-0250. Attenuation storage will be provided underground within the filter drains, with a controlled discharge from the site entering the Data Centre Campus SW network. The DC campus network design has included for the runoff from the Substation SID. A flow control device will be located on the outfall manhole from the Substation, limiting discharge to Qbar rates.

4.4 Proposed SuDS Strategy

4.4.1 Proposed SuDS Hierarchy

The SuDS hierarchy outlined in Figure 4-5 below has been considered for this development in accordance with the requirements of KCC Water Services Department, with priority given to nature-based solutions.

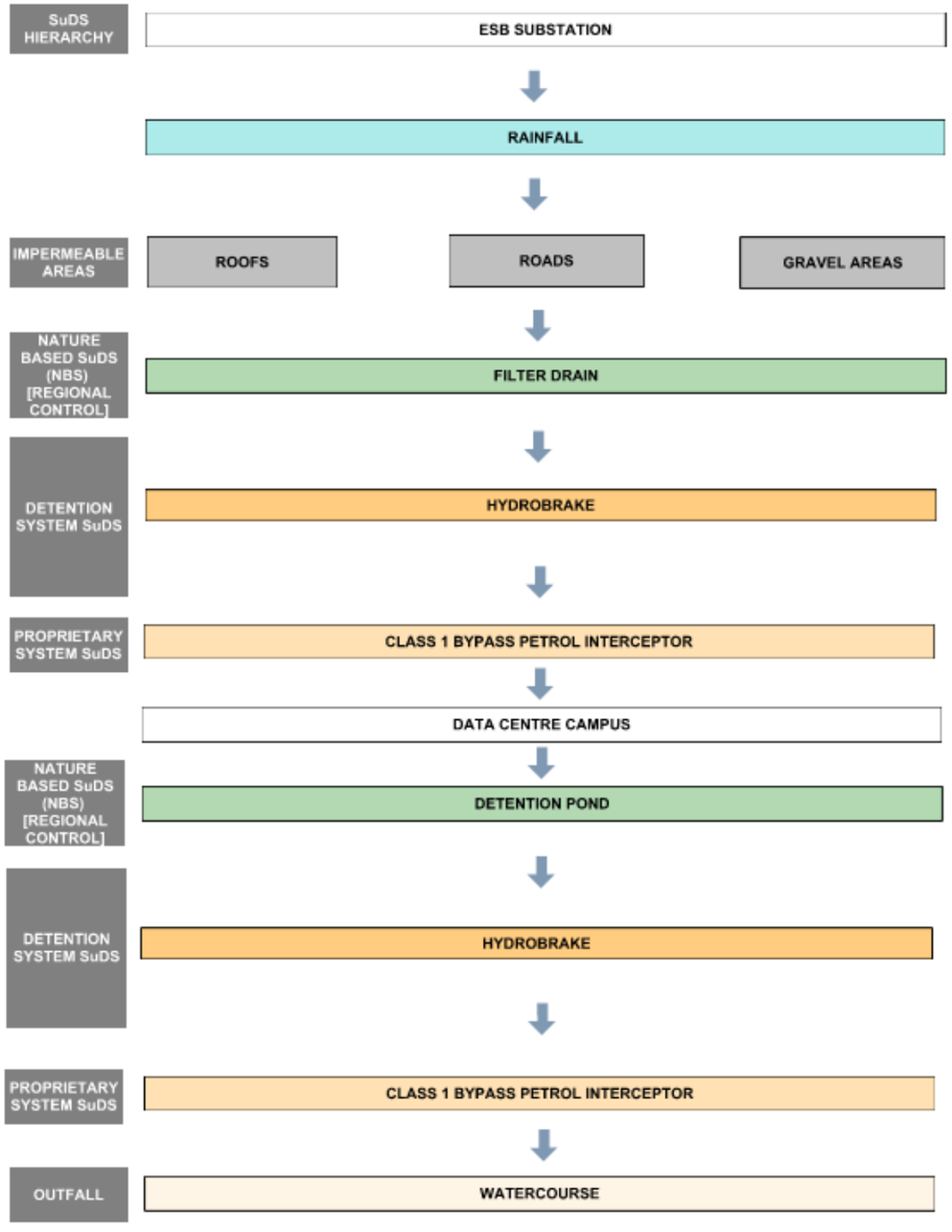
Figure 4-5. SuDS Hierarchy of Features proposed for the development

	Sustainable Urban Drainage System	Regional Control	Source Control	Site Control	Other	Proposed for the Scheme	Rationale for the provision or otherwise of proposed SuDS measures
#	**Nature Based SuDS (NBS)**						
1	Constructed Wetlands	●				N	
2	Retention Pond	●				N	
3	Bioretention Areas		●			N	
4	Bioswales		●			N	
5	Rain Gardens		●			N	
6	Blue-Green Roofs		●			N	
7	Green Walls		●			N	
8	Tree Pits		●			N	
	Infiltration System SuDS						
9	Unlined tree pits-trenches		●			N	
10	Unlined permeable paving		●			N	
11	Infiltration trenches		●			N	
	Filtration System SuDS						
12	Filter Drains		●			Y	Filter Drains are proposed as source control SuDS measures for this project and will supplement the proposed detention basins.
13	Filter Strips		●			N	
14	Lined Permeable Paving		●			N	
	Detention Systems SuDS						
15	Detention Basin			●		N	
16	Lined Underground Attenuation Tank			●		N	
17	Over-sized pipes			●		N	
	Proprietary Treatment Systems						
18	Petrol/ oil separators				●	Y	A Petrol/ oil interceptor is proposed to be placed prior to the discharge of surface water to the public surface water drainage network.
19	Rainwater Harvesting		●			N	

4.4.2 Proposed Treatment Strategy

The minimum 2 stage treatment strategy per sub-catchment proposed for the development and associated SuDS hierarchy is illustrated in Figure 4-6 below.

Figure 4-6. Proposed Treatment Train



4.5 Proposed SuDS Elements

The proposed SuDS Strategy & associated details are indicated on drawing 2232-DOB-ZZ-ZZ-DR-C-0250 and are described in detail below.

4.5.1 Filter Drains

Filter drains are shallow trenches filled with stone/gravel that create temporary subsurface storage for the attenuation, conveyance, and filtration of surface water runoff. The stone may be contained in a simple trench lined with a geotextile, geomembrane, or other impermeable liner, or within a more structural facility such as a concrete trough. Filter drains may be lined (if required) or may allow infiltration depending on the suitability of the underlying soils and the protection they afford to the groundwater.

Filter drains can help reduce pollutant levels in runoff by filtering out fine sediments, metals, hydrocarbons, and other pollutants. They can also encourage adsorption and biodegradation processes. With adequate structural protection, geocellular products can be used as an alternative to some of the stone where the component is designed principally for conveyance: they have a higher void ratio but limited treatment capacity and are often used to provide additional storage zones for high return period flow events in conjunction with other treatment components or gravel layers in the trench.

Filter drains can replace conventional pipework as conveyance systems, and the use of adjacent filter strips or flow spreaders can remove the need for kerbs and gullies when systems are located adjacent to roads or highways. They work best when incorporated into a treatment train and should be used in conjunction with other SuDS components to safely pass and store extreme storm flows.

Filter drains have been selected to be provided along the edge of the hardstanding areas to take direct discharge from the road surface and from the roofs of the buildings on the site to convey water runoff from the site. The filter drains will also provide interception storage by placing the outlet above the base of the trench and attenuation storage for extreme events.

4.5.2 Proprietary Surface Water Treatment System

Proposed Class 1 bypass petrol interceptors shall be incorporated into the drainage system to intercept run-off and improve the quality of surface water discharging into the receiving system in compliance with best drainage practice and SuDS requirements. The interceptors shall serve to provide interception of run-off and deliver removal efficiency rates of up to 80% for suspended solids and hydrocarbons. The interceptors are proposed for use within the basement surface water drainage system.

4.6 Proposed SuDS Features & Associated Management/ Maintenance

The following section of the report addresses the maintenance requirements for the proposed SuDS features to be used on the Substation site in accordance with the guidance given in the CIRIA SuDS Manual. None of the drainage infrastructure on the site is proposed to be taken in charge and will be maintained by the operator of the Substation.

4.6.1 Filtration System SuDS

Filter Drains (Source Control)

Table 4-2. Operation and maintenance requirements for filter Drains

Maintenance Schedule	Required Action	Typica Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices.	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage.	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Petrol/Oil Separators

Table 4-3. Operation and maintenance requirements for proprietary treatment system

Maintenance Schedule	Required Action	Typica Frequency
Routine maintenance	Remove litter and debris and inspect for sediment, oil, and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease, and suspended solids	As necessary – indicated by system inspections or immediately following significant spill
Remedial Actions	Replace malfunctioning parts of structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter for media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

4.7 Proposed Design of Sustainable Drainage System

The design of sustainable drainage systems, as per Chapter 6 of the Greater Dublin Strategic Drainage Study (GDSDS), is set out below and describes the performance of the proposed surface water drainage system when measured against the relevant GDSDS drainage criterion, namely;

- Criterion 1 – River Quality Protection
- Criterion 2 – River Regime Protection
- Criterion 3 – Level of Service (flooding) for the Site
- Criterion 4 – River Flood Protection

The requirements of SuDS are typically addressed through the provision of

- Interception Storage
- Treatment Storage (not required if interception storage is provided)
- Attenuation Storage
- Long Term Storage (not required if growth factors are not applied to Qbar when designing attenuation storage)

In accordance with KCC WSD requirements, a Climate Change factor of 30% will be applied to the design of the surface water system.

4.7.1 River Quality Protection

Objective

Interception storage of at least 5mm, and preferably 10mm, of rainfall where run-off to the receiving water can be prevented.

Proposal

The 10mm rainfall event on site will be intercepted without discharging to the public system. The below is a summary of the interception storage provided per sub-catchment.

Table 4-4. Summary of drained areas

Area Description	Area (m^2)
Roofs	1,344
Hardstanding	1,881
Gravel Area	2,775

Therefore, the total area draining to the discharging to the drainage system is 6,000m^2. The required interception storage volume to accommodate the 10mm rainfall event is therefore 6,000 x 0.01 = 60m^3

A summary of the interception volumes provided is as follows: -

- Filter Drain
  - o 355m x 1.5m wide x 0.3m depth of interception with 40% voids stone = 64m^3

The total provided interception storage = 64m^3, while the total required interception storage is 60m^3. Therefore, the interception storage provided on the site for the 10mm event exceeds with the requirements of GDSDS and the River Quality Projection objective.

4.7.2 River Regime Protection

Objectives

2.1 Discharge rate equal to 1-year Greenfield site peak runoff rate or 2 l/s/Ha, whichever, is the greater. Site critical duration storm to be used to assess attenuation volume.

2.2 Discharge rate equal to 1 in 100-year Greenfield site peak run off rate. Site critical duration storm to be used to assess attenuation storage volume.

Proposals

The surface water network has been designed to comply with these sub-criteria and prior to discharging to the existing Bluebell watercourse, the surface water runoff will be reduced to the existing total Greenfield runoff rate, Qbar, of 3.6l/s. To achieve this, it is proposed to limit the surface water runoff from the site via a proposed hydro brake flow control device fitted to the discharge manhole of each catchment. Site Qbar calculations are included in Appendix D. Level of Service (flooding) for the Site.

Objectives

- No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes is normally critical.
- No internal property flooding. Planned flood routing and temporary flood storage accommodation on site for short high intensity storms. Site critical duration events.
- No internal property flooding. Floor levels at least 500mm above Maximum River level and adjacent on-site storage retention.

No flooding of adjacent urban areas. Overland flooding managed within the development.

Proposal

Engineering calculations included in Appendix D demonstrate that no pluvial out-of-manhole flooding of the proposed surface network occurs for storms up to and including a 1 in 100 Year plus 30% Climate Change. Therefore, no flooding of the site, internal properties or adjacent urban areas occurs. Pipe sizes and gradients have been designed to achieve self-cleansing velocities as per the requirements of the Building Regulations Part 'H'. The lowest proposed floor level is set at +83.00mOD which is a minimum of 500mm freeboard to the top of water level in the lowest attenuated flood level. In the event of a storm exceeding a 1:100 Year plus 30% Climate Change event and the outfall becoming block, a high-level overflow is provided. Engineering Calculations included in Appendix D demonstrate that no pluvial out-of-manhole flooding occurs when the outfall is set to the high-level overflow level.

4.7.3 River Flood Protection

Objectives

- Long-term floodwater accommodated on site for development runoff volume is in excess of the Greenfield volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme flood events only. 100-year, 6-hour duration storm to be used for assessment of the additional volume of runoff.
- Infiltration storage provided equal in volume to long term storage and usually designed to operate fort all events.
- Maximum discharge rate of Qbar or 2 l/s/Ha, whichever is the greater, for all attenuation storage where separate long-term storage cannot be provided.

Proposals

As noted above, the proposed Qbar for the total site is 3.6 l/s and as the surface water run-off generated on site does not exceed Qbar there is no requirement for long-term storage to limit the impact on the receiving watercourse.

4.8 CIRIA SuDS Health & Safety Risk Assessment

A risk assessment appropriate to the planning stage design has been carried out in accordance with good practice for attenuation ponds provided on the site. Consideration has been given to both authorised and unauthorised personnel accessing the site. Health & Safety mitigation measures associated with open waterbodies on the site that have been adapted include:

- Access for normal maintenance will be provided for site personnel and H&S mitigation will form part of site-specific training for maintenance/facility staff.
- Maximum water levels will only occur during periods of severe storms (1:30 to 1:100 years events) and water levels will dissipate at Qbar run off rates over an approximate 24-hour period to return the water levels to dry weather conditions. High level overflows will be provided so that top water levels for the 1:100 + climate change design scenarios are not exceeded.

4.9 Proposed Piped Surface Water Network Design Parameters

The surface water piped network and associated attenuation design calculations have been prepared using InfoDrainage Network Design Computer software by Innovyze with the drainage parameters that can be found in Table 4-5 and Appendix D for full set of calculations. The proposed surface water drainage system has been designed in accordance with I.S. EN 12056: 2000 'Gravity Drainage Systems inside Buildings', I.S. EN 752: 2017 'Drain & Sewer Systems outside Buildings', 'The Greater Dublin Region Code of Practice for Drainage Works', the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS) and the Building Regulations Technical Guidance Document Part H applying the following parameters.

Table 4-5. Drainage Parameters

Surface water drainage design method	Modified Rational Method
Surface water drainage design method	1 in 5 year
Storm Return period (years)	3.6 l/s
Allowable outflow (l/s)	Up to and including a 1 in 100 Year + 30% CC
Flooding Period	848
Standard Annual Average Rainfall (SAAR) (mm)	
M5-60 rainfall depth (mm)	16.2
Ratio, r	0.287
Allowance for Climate Change (%)	30
Minimum self-cleansing velocity (m/s)	
Pipe roughness (mm)	0.75
Run-off coefficients	0.6
Gravel areas	
External hardstanding areas	50%

4.10 Attenuation Design

As noted in section 4.3 above, the proposed surface water attenuation on the site shall be provided in a number of underground filter drains. Attenuation will be provided on site to cater for the 1 in 100 year + 30% climate change. The proposed attenuation volume provided for the site consists of 355m of 1.5m wide by 1m deep stone filled filter drains with 40% voids. The total attenuation volume provided is 213m^3.

The results of the surface water attenuation design calculations prepared using the InfoDrainage Network Design Computer software by Innovyze, show a required attenuation volume of 130m^3 for the 1 in 100 year + 30% climate change storm events. Therefore, the provided attenuation volume is greater than the required attenuation volume.

5 Foul Drainage

5.1 Proposed Foul Drainage Strategy

Foul effluent from the site will be low as there are limited facilities and staff on the site (1 W.C. and 1 kitchenette sink). The proposed foul strategy will be to provide a new local foul drainage network to collect effluent from the substation building and from the MV room gullies and discharge from the Substation site into the adjacent Herbata Data Centre foul drainage network as indicated on engineering drawing 2232-DOB-ZZ-ZZ-DR-C-0350 which conveys flows to a pumping station located on the site and discharges, via a rising main to the existing public foul drainage network located in the L2030 road to the south of the site. The DC network has been designed with sufficient capacity to accept the effluent from the Substation and is the subject of a separate planning application to Kildare County Council (Application Ref:24/60787/ ACP Ref:*323677*).

The layout of the proposed foul drainage network is included on drawing 2232-DOB-ZZ-ZZ-DR-C-0350 included with this application.

5.2 Proposed Foul Network Design

The foul sewer network as shown on drawing 2232-DOB-ZZ-ZZ-DR-C-0350 has been designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice for Wastewater Infrastructure IW-CDS-5030-03 (Revision 1 – December 2017), IS EN 752 Drain & Sewer Systems outside Buildings, IS EN 12056 Gravity Drainage Systems inside Buildings and the Building Regulations Technical Guidance Document Part H Drainage & Wastewater.

The foul network shall convey effluent generated by the limited workforce present at the Substation. As noted in the pre-connection enquiry submitted to Uisce Eireann staff are not permanently present on the site. Occasional presence is required for maintenance and repair by a limited number of individuals. To conservatively estimate the impact of the development on the Uisce Eireann infrastructure an effluent flow has been calculated based on 2 permanent members of staff as follows:

No. of Staff on Site = 2

Waste Generated = 50 litres/person/day (Factory Equivalent)

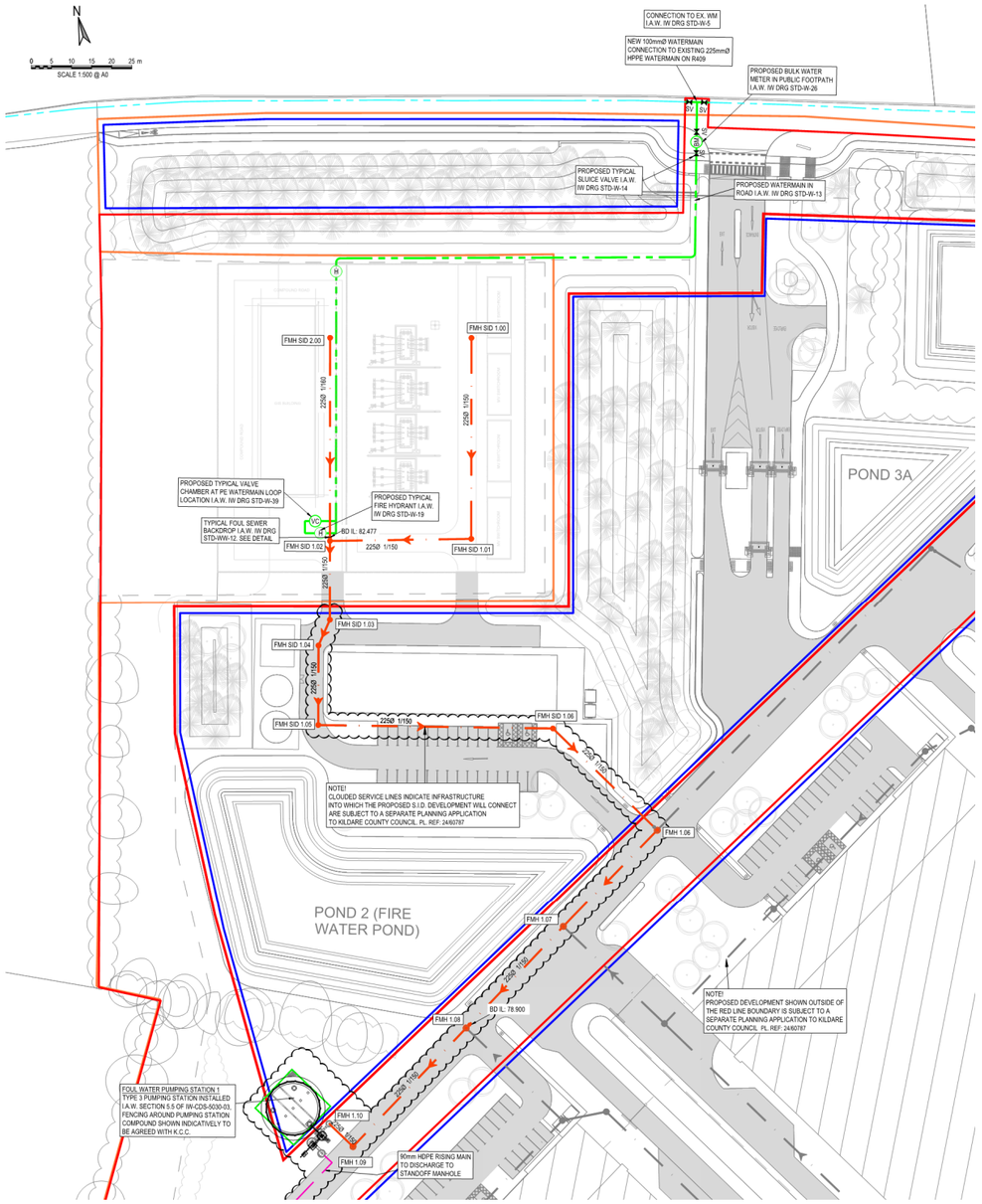
Total Daily Demand = 100 Litres

Assume 8 hour working day = 0.0035 litres/second

6 x D.W.F. = 0.021 litres/second

The effluent will discharge into the Data Centre Campus Infrastructure via a manhole at the perimeter of the Substation site as indicated on engineering drawing 2232-DOB-ZZ-ZZ-DR-C-0350. A pumped foul connection from the Data Centre Campus development shall be made via a rising main and stand-off manhole arrangement to the existing 300mm diameter public foul sewer, located to the south of the site along the L2030 (Newhall Road) as outlined under application Ref:24/60787/ ACP Ref:*323677*.

Figure 5-1. Foul Drainage Layout



5.3 Consultations with Uisce Eireann (Formerly Irish Water)

A pre-connection enquiry has been submitted to Uisce Eireann outlining the proposed strategy. Uisce Eireann have issued a Confirmation of Feasibility for the proposed development as shown in Appendix E. The Confirmation of Feasibility response has noted that a new wastewater connection can be facilitated, without any upgrades to the existing public infrastructure.

6 Water Supply

6.1 Proposed Water Supply Strategy

As noted in Section 5.1 above, there will be limited use of the proposed development from a staffing perspective and therefore water demand will be low. It is proposed that the substation development will be served by an independent water supply taken from the existing 225mm watermain that runs along the R409. A new metered 100mm connection will be provided for the development to serve the potable and firefighting demand of the substation.

Refer to engineering drawing 2232-DOB-ZZ-ZZ-DR-C-0350 for the proposed watermain layout.

6.1.1 Portable Water Supply

A new dedicated water supply is proposed to be taken from the existing 225mm dia. public water supply located along the R409 to serve the potable water supply demands of the site. As noted in section 5 the water demand will be infrequent and occasional. The estimated average hour water demand and peak hour water demand generated by the proposed development are 0.003125l/s and 0.039l/s respectively as calculated below in accordance with Uisce Eireann Code of Practice for Water.

No. of Staff on Site = 2

Water Demand = 45 litres/person/day (Factory Equivalent)

Total Daily Demand = 90 litres

Assume 8 hour working day = 0.003125 litres/second (Average Daily Domestic Demand)

1.25 X ADDD = 0.039 litres/second (Average Day / Peak Week Demand)

5.0 X AD/PW = 0.0195 litres/second (Peak Hour Water Demand)

6.1.2 Firefighting Water

The recommended firefighting water demand purposes for the proposed site is 20l/sec based on industrial site of less than 1 ha. Taken from the ‘National Guidance Document on the Supply of Water for Fighting Fire’ – Appendix E. A hydrant will be located proximate to the Substation development that is fed by the Data Centre campus infrastructure as outlined under application Ref:24/60787/ ACP Ref:*323677*.

6.2 Consultations with Uisce Eireann

A pre-connection enquiry has been submitted to Uisce Eireann outlining the proposed strategy. Uisce Eireann have issued a Confirmation of Feasibility for the proposed development as shown in Appendix E. The Confirmation of Feasibility response has noted that a new wastewater connection can be facilitated, without any upgrades to the existing public infrastructure.

7 Roads Infrastructure & Transport

7.1 Existing Road Infrastructure

The existing site is bound to the north by a public road (R409). This road provides access to residents along the R409 as well as providing access to the Osberstown Business Park. There is no existing direct access to the site of the proposed Substation currently.

7.2 Proposed Road Infrastructure and Access

The proposed access to the Substation site will be via the adjacent Herbata Data Centre Campus which is the subject of a separate planning application with Kildare County Council. The proposed access arrangements are indicated on drawing number 10360452-HDR-XX-XX-DR-C-112250. The internal roads within the Data Centre development are to remain private and will be maintained by the Data Centre management company.

The internal roads within the substation development are for occasional access of work vehicles only. Adequate roadway has been provided for fire tender access around the new substation building and within the adjacent MV room area for turning vehicles. A vehicle tracking analysis has been undertaken for the site access road and the internal roads and is included on drawings 10360452-HDR-XX-XX-DR-C-112330, 10360452-HDR-XX-XX-DR-C-112340, 10360452-HDR-XX-XX-DR-C-112370, 10360452-HDR-XX-XX-DR-C-112380.

7.3 Parking

Due to the nature of the development, there is no requirement for formal parking at the site. Incoming traffic will be limited to occasional access by work vehicles. There is adequate space provided in the hardstanding area to the south of the new building for vehicles to park.

It is not considered necessary, due to the nature of the development and the occasional access for works and maintenance only, that cycle parking be provided.

Appendix A. Register of Drawings Accompanying Application

Appendix B. IGSL Site Investigation Report

Appendix C. Surface Water Qbar Calculations

Appendix D. Surface Water Network Calculations

Appendix E. Uisce Eireann Confirmation of Feasibility

Appendix F. Fire Hydrant Flow Simulation Testing