

Data and Power Hub Services Ltd.

# GIS Substation Compound and Transformers / MV Switch Room Compound at Grange Castle

## Water Services Report

February 2021





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## SECTION 1: INTRODUCTION

- 1.1 Data and Power Hub Services Limited is applying for Planning Permission to An Bord Pleanála as part of the Strategic Infrastructure Development Application (SID) for the 110kV Gas Insulated Switchgear (GIS) Substation Compound and Transformers / MV Switch Room Compound and for a 2 No. transmission lines at Grange Castle, Co. Dublin. The proposed development will consist of the following:

The construction of the GIS Substation and Transformers / MV Switch Room Compounds along with associated ancillary works. The proposed development will include the provision of a two storey GIS Substation building, with a gross floor area of 1,430sqm, and The Transformers / MV switch room compound, including three transformers plus MV switch room, with a gross floor area of 200sqm.

The proposed development comprises one element of a wider development of the overall site of 8.2 hectares and will be located to the south of the Power Generation Facility that was permitted under SDCC Reg. Ref. SD20A/0058 and to the north of the application for 2 no. two storey Information Communication Technology (ICT) facilities under SDCC Reg. Ref. SD20A/0324 (Figure-1).

The development will be accessed from a new vehicular entrance from Peamount Road that will provide access to the GIS Substation and Transformers / MV Switch Room Compounds at the rear of the site; and will also include ancillary site development works, including changes to the attenuation pond permitted under SDCC Reg. Ref. SD20A/0058, and connection to the existing infrastructural services and network as well as car parking, lighting and fencing.

This report has been prepared in support of the Planning Application.



**Figure-1: Location of Proposed Development (Source: Google Maps, annotation by J.B. Barry & Partners)**

- 1.2 This Report addresses the following:
- Meetings with An Bord Pleanála
  - Water Supply

- Foul/Process Effluent Disposal
- Surface Water Disposal

## SECTION 2: MEETING WITH AN BORD PLEANÁLA

- 2.1 A pre-planning consultation meeting was held to discuss the proposed development with An Bord Pleanála as part of the SID application on 13 November 2020, followed by with subsequent correspondence.

## SECTION 3: WATER SUPPLY

- 3.1 The proposed development will be supplied from the existing 4" AC watermain in the public road directly outside the site as shown on drawing 19229-JBB-00-XX-DR-C-01502 (see also appendix 2 for the drainage records drawing). A new metered 150mm diameter supply will be installed to provide potable water for domestic purposes and to supply the production process. Details are shown on Drawing No. 19229-JBB-00-XX-DR-C-01502 which accompanies the planning application.
- 3.2 The daily domestic water demand for the proposed development is based on Appendix D of the Irish Water Code of Practice for Wastewater Infrastructure (July 2020 - Rev 2). The number of staff in the GIS Substation and Transformers / MV switch Room together with the Power Generation Facility that was permitted under SDCC Reg. Ref. SD20A/0058, is estimated to be 5 persons per day.

Substation/ Power Generation Facility Staff: 5 staff\*100l/employee/day = 500 l/day (0.5 m<sup>3</sup>/day)

Daily Domestic Water Demand = 500 l/day (0.5 m<sup>3</sup>/day)

Average Water Demand: 500 l/day/8\*3600 = 0.02 l/sec

Average Day/Peak Week Demand: 0.02 l/sec\*1.25 = 0.03 l/sec

Peak Demand = Average Day/Peak Week Demand\*5 = 0.03 l/sec\*5 = 0.15 l/sec

- 3.3 A Pre-Connection Enquiry form was submitted to Irish Water on 24<sup>th</sup> February 2020 as part of the Power Generation Facility, which had accounted for the GIS Substation and Transformers / MV switch Room and was permitted under SDCC Reg. Ref. SD20A/0058. A Confirmation of Feasibility was issued by Irish Water on the 14<sup>th</sup> April 2020 and a copy of this is included in Appendix 1.
- 3.4 Watermain works including firefighting requirements, Water Conservation Measures, Metering and Pressure Control will be strictly in accordance with Irish Water and the County Council's requirements, specifications and standard details.

## SECTION 4: FOUL EFFLUENT DISPOSAL

- 4.1 The proposed Development will discharge via a 225mm sewer to the exiting 375mm public sewer to the east of the site, approximately 550m away, as shown on drawing no. 19229-JBB-00-XX-DR-C-01500.
- 4.2 The estimated Domestic Foul Effluent Loading (Dry Weather Flow-DWF) from the proposed development, is based on Section 3.6 and Appendix D of the Irish Water Code of Practice for

Wastewater Infrastructure (July 2020 - Rev 2). As noted previously, the number of staff in the GIS Substation and Transformers / MV Switch Room, together with the Power Generation Facility that was permitted under SDCC Reg. Ref. SD20A/0058, is estimated to be 5 persons per day.

Total Daily Foul Flow:

Substation/ Power Generation Facility Staff: 5 staff\*100 l/employee/day = 500 l/day (0.5 m<sup>3</sup>/day)

1 Dry Weather Flow (DWF): 500 l/day/8\*3600 = 0.02 l/sec

3 Dry Weather Flow (DWF - Peak Flow): 0.02 l/sec\*3 = 0.06 l/sec

- 4.3 A Pre-Connection Enquiry form was submitted to Irish Water on 24th February 2020 as part of the Power Generation Facility which had accounted for the GIS Substation and Transformers / MV switch Room and was permitted under SDCC Reg. Ref. SD20A/0058. A Confirmation of Feasibility was issued by Irish Water on the 14th April 2020 and a copy of this is included in Appendix 1.
- 4.4 Foul sewer construction will comply with the County Council's and Irish Water's requirements, specification and standard details.

## SECTION 5: SURFACE WATER DISPOSAL

- 5.1 Details of the proposed surface water network and SuDS measures for the proposed development are shown on drawing no. 19229-JBB-00-XX-DR-C-01500. It is proposed to connect to the existing public surface water network to the exiting 450mm public sewer to the east of the site, approximately 550m away. This will necessitate laying a 225mm outfall pipe through the public roads, the R120 and R134.

- 5.2 The foul and storm sewer networks will be on separate systems, see Drawing No. 19229-JBB-00-XX-DR-C-01500.

- 5.3 SuDS (Sustainable Urban Drainage Systems) is defined in The SuDS Manual, CIRIA 753, 2015 as follows:

*"Drainage systems that are considered to be environmentally beneficial, causing minimum or no long-term detrimental impact."*

The SuDS strategy adopted for the Development provides a comprehensive approach to the management of storm water on the site in line with the SuDS triangle namely, water quality, water quantity and amenity/biodiversity. The treatment train approach has been adopted for the design of the storm water system for the Development. This approach uses suitable SuDS measures in providing source, site and regional controls.

- 5.4 The various SuDS measures proposed for the Development are as follows, see appendix 3 for SuDS measures considered:

- Bio Retention
- Swales and Filter Drains
- Attenuation/Detention Ponds
- Permeable Paving
- Silt and Hydrocarbon interceptors for road carriageways/carpark areas

- 5.5 Flows from the development will be attenuated in the Detention Pond which is sized to cater for all three developments for the 100 year critical storm event plus 20% for climate change in accordance with GSDS requirements. The main Attenuation/Detention Pond will have an effective storage volume of 2,903m<sup>3</sup> with an additional 325m<sup>3</sup> storage available in a 2nd pond located to the East. Flows from the overall development will be limited to 56.3 l/sec via hydro-brake flow control device for the 100 year critical storm event (refer to calculations in appendix 4).
- 5.6 All SuDS measures will be agreed with South Dublin County Council.
- 5.7 A hydrocarbon interceptor will be provided for the proposed development as shown on drawing no. 19229-JBB-00-XX-DR-C-01500.
- 5.8 The storm water run-off from the Development will pass through a minimum of 3 SuDS Devices. The SuDs approach complies with Volume 2, New Development, GSDS and the LAP including Appendix 3.
- 5.9 The storm water system will be in accordance with "The Regional Code of Practice for Drainage Works and South Dublin County Council requirements.

## SECTION 6: SECTION 6 RELATED REPORT

- 6.1 A Site-Specific Flood Risk Assessment have been prepared as a separate document.

## SECTION 7: RELEVANT DRAWINGS

7.1	Drawing No	Title
	19231-JBB-00-XX-DR-C-01500	Foul & SW Layouts
	19231-JBB-00-XX-DR-C-01501	Road and Block Levels
	19231-JBB-00-XX-DR-C-01502	Watermain Layout
	19231-JBB-00-XX-DR-C-01503	Typical SW Drainage Details
	19231-JBB-00-XX-DR-C-01504	Typical Foul Drainage Details
	19231-JBB-00-XX-DR-C-01505	Typical Watermain Details Sheet 1
	19231-JBB-00-XX-DR-C-01506	Typical Watermain Details Sheet 2
	19231-JBB-00-XX-DR-C-01507	Typical SuDS Devices

# **APPENDIX 1**

## **IRISH WATER – CONFIRMATION OF FEASIBILITY STATEMENT**





Andrew Monahan  
JB Barry & Partners Ltd  
Classon House  
Dundrum Business Park  
Dundrum  
Dublin 14  
D14T9T0

14 April 2020

Dear Andrew Monahan,

Uisce Éireann  
Bosca OP 448  
Oifig Sheachadta na  
Cathrach Thosaí  
Cathair Chorráil

Irish Water  
PO Box 448,  
South City  
Delivery Office,  
Cork City

[www.water.ie](http://www.water.ie)

**Re: Connection Reference No CDS20001484 pre-connection enquiry -  
Subject to contract | Contract denied**

**Connection for Business Connection of 1 unit(s) at Peamount Road, Newcastle, Co. Dublin**

Irish Water has reviewed your pre-connection enquiry in relation to a water and wastewater connection at Peamount Road, Newcastle, Co. Dublin.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

**Water:**

In order to accommodate the proposed connection to Irish Water network at the Premises, upgrade works are required as follows:

- Connection main - (Approx.) 50m of new 200mm pipe main to be laid to connect the site development to the existing 700 mm main. Bulk meter to be installed on the connection main to be linked with telemetry online. See red thick-line in the figure below;
- On site storage for the average day peak week demand of the commercial section. Storage is required to supply this demand for 24 hours and have a re-fill time of 12 hours.

Irish Water currently does not have any plans to extend its network in this area. Should you wish to progress with the connection you will be required to fund this network extension.

This Confirmation of Feasibility to connect to the Irish Water infrastructure also does not extend to your fire flow requirements. Please note that Irish Water cannot guarantee a flow rate to meet fire flow requirements and in order to guarantee a flow to meet the Fire Authority requirements, you may need to provide adequate fire storage capacity within your development.

In order to determine the potential flow that could be delivered during normal operational conditions, an onsite assessment of the existing network is required.

**Wastewater:**

There is no Irish Water infrastructure adjacent to the site.

Connection to the Irish Water networks may be through third party infrastructure (located approx. 370 m from the site) and all relevant wayleave and permissions would need to be obtained by the client. Please be advised that at connection application stage you have to provide written confirmation from the owner of the infrastructure that you have received legal permission to connect to and that the infrastructure is fit for purpose and has capacity to cater additional load from the Development.

**Trade Discharge:**

An Application may also be made for a Section 16 Trade discharge effluent licence prior to any development occurring on this site.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at [www.water.ie/connections](http://www.water.ie/connections). Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

If you have any further questions, please contact Deirdre Ryan from the design team on 022 54620 or email [deiryan@water.ie](mailto:deiryan@water.ie). For further information, visit [www.water.ie/connections](http://www.water.ie/connections).

Yours sincerely,



**Maria O'Dwyer**

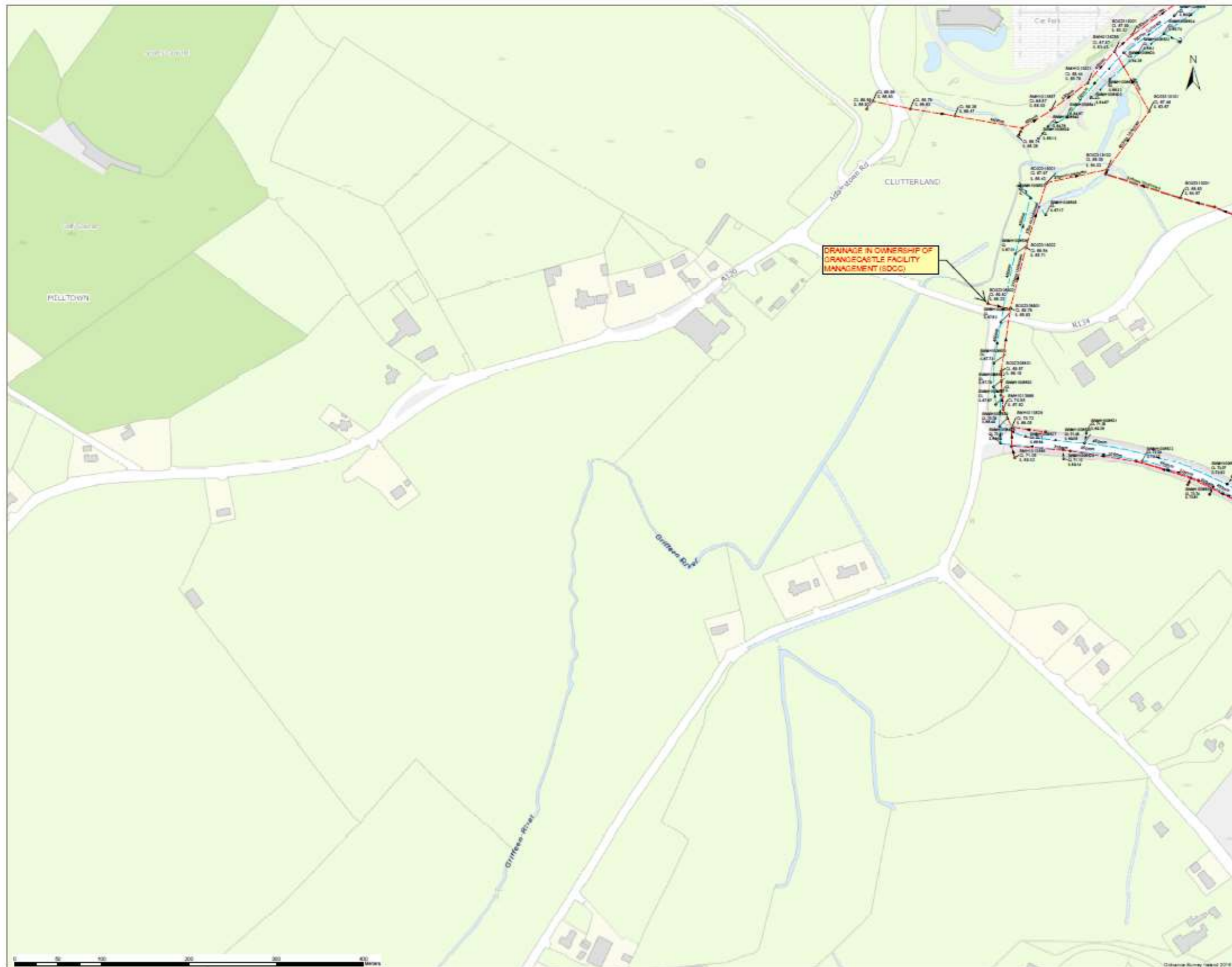
**Connections and Developer Services**



## **APPENDIX 2**

### **DRAINAGE RECORDS**





- Legend**
- Gravity - Combined
  - Gravity - Foul
  - Gravity - Overflow
  - Gravity - Unknown
  - Pumping - Combined
  - Pumping - Foul
  - Pumping - Overflow
  - Pumping - Unknown
  - Syphon - Combined
  - Syphon - Foul
  - Syphon - Overflow
  - Overflow
  - Gravity - Combined
  - Gravity - Foul
  - Gravity - Overflow
  - Gravity - Unknown
  - Pumping - Combined
  - Pumping - Foul
  - Pumping - Overflow
  - Pumping - Unknown
  - Syphon - Combined
  - Syphon - Foul
  - Syphon - Overflow
  - Overflow
  - Surface Gravity Mains
  - Surface Gravity Mains Private
  - Surface Water Pressurised Mains
  - Surface Water Pressurised Mains Private

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**Legend**

- ▲ Pump Stations
- Irish Water
- Private
- Irish Water
- Non IW

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## **APPENDIX 3**

### **SUDS MEASURES CONSIDERED**



## Project - GIS Substation Compound and Transformers / MV Switch Room Compound at Grange Castle

In accessing the various "SuDS Systems and techniques available for use in the proposed development, the "Greater Dublin Strategic Drainage Study" (GSDSDS) and "CIRIA Document 522 – Sustainable Urban Drainage Systems" were consulted to establish a suitable set of drainage features (**treatment train**)

Details of the SuDS measures considered in principle are set out in the table below.

Type of System	Device	Primary Function	Primary Characteristics	Consideration	Comments
Source Control	Avoiding foul connections to storm systems	Avoid direct pollution of storm system	Maintaining principle of separate drainage systems	Incorporated	Separate foul and surface water drainage systems provided.  CCTV survey and "As Built" mapping of drainage system on completion by Contractor to ensure adherence to this principle.
Pollution Prevention	Management of pollution sources	Prevention of polluted runoff.	Interception of pollutants in runoff	Incorporated	Class 1 Petrol interceptor to be installed
Source Control	Green-Roof	Minimize runoff and wash off of pollutants	Interception of pollutants in runoff and attenuation of flows	Not Incorporated	Not Incorporated due to construction types.
Infiltration Systems	Underground Detention/Infiltration System	Minimize runoff, flow attenuation encourage stormwater to soak into the ground while filtering pollutants	Permeable features allowing Infiltration and attenuation of flows	Not Incorporated	Not incorporated as dry swales noted below are instead
Source Control	Bio Retention	Minimize runoff, flow attenuation encourages stormwater to soak into the ground while filtering pollutants	Pervious surface on footpaths	Not Incorporated	Not incorporated
Source Control	Permeable Pavement. Minimising impermeable areas	Minimize runoff and wash off of pollutants	Pervious surface on parking areas.	Not Incorporated	Not incorporated
Infiltration Systems	Infiltration trenches, swales	Encourage stormwater to soak into the ground while filtering pollutants	Permeable features allowing Infiltration	Incorporated	Dry swales to be constructed
Infiltration Systems	Ponds, Basins	Encourage stormwater to soak into the ground while filtering pollutants	Permeable features allowing Infiltration	Incorporated	Pond to be constructed
Source Control	Rainwater Harvesting	Rainwater Harvesting	Minimize runoff, flow attenuation, water re-use	Not Incorporated	Not incorporated



## **APPENDIX 4**

### **SURFACE WATER CALCULATIONS**



# Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:

Site name:

Site location:

### Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

### Site characteristics

Total site area (ha):	8.173
Significant public open space (ha):	0
Area positively drained (ha):	8.173
Impermeable area (ha):	5.517
Percentage of drained area that is impermeable (%):	68
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	8.17
Net impermeable area for storage volume design (ha):	5.76
Pervious area contribution to runoff (%):	30

\* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of  $Q_{BAR}$  and other flow rates will have been reduced accordingly.

### Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

### Methodology

estl:

$Q_{BAR}$  estimation method:

SPR estimation method:

### Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

### Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	61
Rainfall 100 yrs 12 hrs:	--	73
FEH / FSR conversion factor:	1	1
SAAR (mm):	964	964
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydrological region:	12	12
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.72	1.72
Growth curve factor 30 year:	2.13	2.1
Growth curve factor 100 years:	2.61	2.6
$Q_{BAR}$ for total site area (l/s):	21.66	21.66
$Q_{BAR}$ for net site area (l/s):	21.66	21.66

### Site discharge rates

	Default	Edited
1 In 1 year (l/s):	18.4	18.4
1 In 30 years (l/s):	46.1	45.5
1 In 100 year (l/s):	56.5	56.3

### Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	2389	2388
Long term storage 1/100 years (m³):	1197	1197
Total storage 1/100 years (m³):	3585	3585