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Engineering Services Report

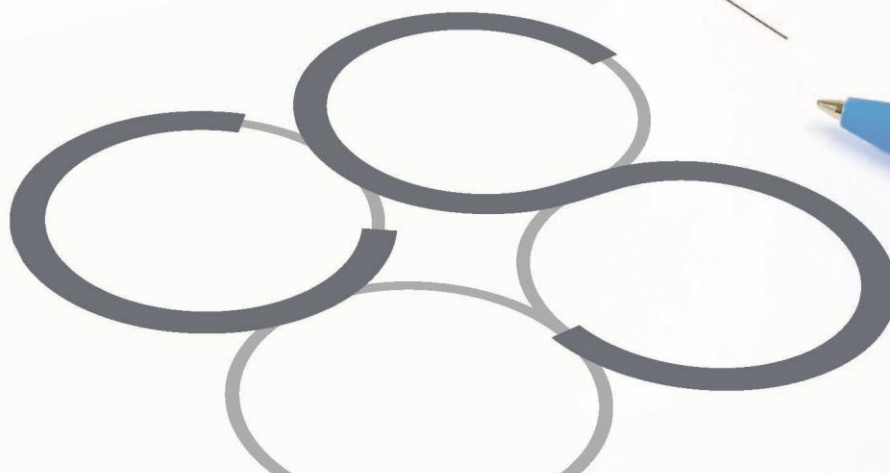
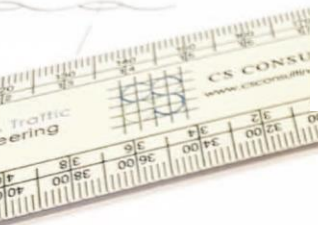
Proposed Residential Development

Bruff, Co. Limerick

Client: Limerick City and County Council

Job No. L105L

February 2024



ENGINEERING SERVICES REPORT

PROPOSED RESIDENTIAL DEVELOPMENT, BRUFF, CO. LIMERICK

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BS 1192 FIELD **BRUF-CSC-ZZ-XX-RP-C-0001-P2**

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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Limerick City and County Council to prepare an Engineering Services Report for a proposed residential development at Bruff, Co. Limerick.

This report details the following aspects of the proposed development:

- Stormwater Drainage Infrastructure
- Foul Drainage Infrastructure
- Potable Water Infrastructure
- Development Access
- Internal Road Layout
- Car Parking and Bicycle parking Provisions

In preparing this report, CS Consulting has made reference to the following:

- Limerick City and County Development Plan 2022-2028;
- Irish Water Drainage and Water Supply Records;
- CIRIA C753 - The SuDS Manual.

The Engineering Services Report is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with all other relevant documentation submitted by other members of the project design team.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The proposed development site is located in Ardykeohane, Bruff, Co Limerick. The site is in the administrative jurisdiction of Limerick City and County Council (LCCC) and has a total area of circa 0.82ha.

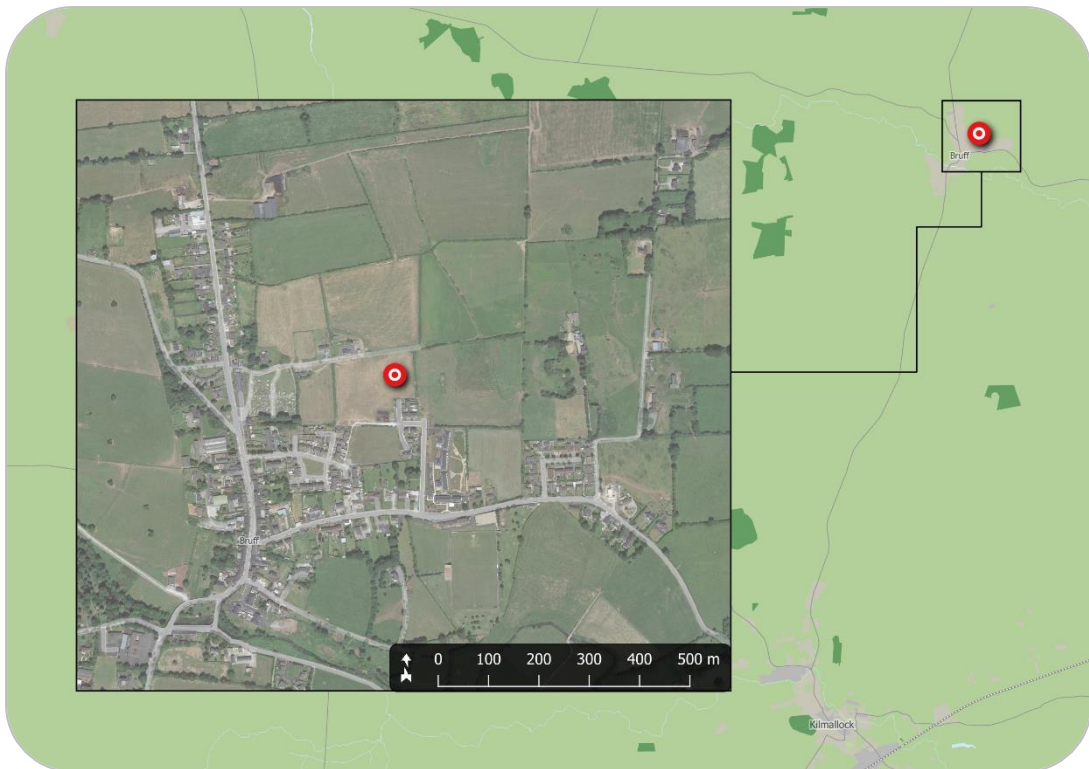


Figure 1 – Location of proposed development site
(map data & imagery: EPA, OSi, OSM Contributors, Google)

The location of the proposed development site is shown in Figure 1 above; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in Figure 2.



Figure 2 – Indicative site extents
(map data & imagery: OSM Contributors, Google)

The proposed development site is bound by existing single dwelling residential property to the north-west, existing residential buildings to the south-east, and on all other sides by greenfield.

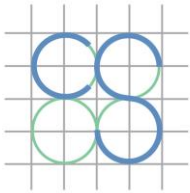
In the Limerick Development Plan 2022-2028, the development site is zoned as 'New Residential Zone'.

2.2 Existing Site Condition

The subject development site is currently greenfield. River Morningstar is located approx. 580m to the south of the development site.

2.3 Description of the Proposed Development

The proposed development primarily consists of:



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The construction of 18no. dwellings, provision of an access road connecting to Brugh na nDeise, 30no. car parking spaces, bicycle parking, infrastructural works, hard and soft landscaping and ancillary works.

3.0 SURFACE WATER DRAINAGE

3.1 Existing Storm Water Drainage

Irish Water Drainage Records do not indicate any public storm water sewers in the vicinity of the development site.

However, a topographical survey was carried out in and around the development site. The survey indicates that there is an existing 300mm storm sewer to the south on the development site.

3.2 Proposed Stormwater Drainage Arrangement

The storm water drainage for the proposed development shall be managed in two phases.

The first phase is to restrict storm water runoff from the proposed development to greenfield runoff rates or 2.0l/sec, whichever is greater. The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1-in-100-year storm event, increased by 20% for predicted climate change factors.

These parameters allow the Q-Bar greenfield runoff rate to be calculated. The calculated Q-Bar rate was determined to be 2.51l/sec. Therefore, the allowable discharge rate off site for any given storm event will be limited to 2l/sec by way of using an approved flow control device.

The proposed development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1-in-100-year storm event increased by 30% for predicted climate change factors. No additional storage has been provided to account for urban creep as it is not anticipated. It is proposed to provide an attenuation tank of volume 200m³ for the 1-in-100-year storm



event. This attenuation tank shall be located beneath the open space to the north-west of the development site.

The proposed new storm water drainage arrangements shall be designed and carried out in accordance with:

- a) BS EN – 752:2008, Drains & Sewer Systems Outside Buildings.
- b) Part H, Building Drainage of The Building Regulation.

All the storm water collected in the attenuation tank shall be discharged into the existing 300mm storm sewer to the south-west of the development site by gravity via a flow control mechanism. The proposed discharge rate shall be 2.0l/s. Separate sewers and manholes for foul and storm water shall be maintained within the development site boundary. A wayleave of 3m shall be maintained along the proposed storm sewer until the final outfall into the existing storm sewer.

Refer to CS Consulting drawing **BRUF-CSC-ZZ-XX-DR-C-0002** for the proposed stormwater drainage layout for the development and **Appendix A** for Attenuation Calculations.

3.3 Proposed Sustainable Drainage Systems

The second phase is to include Sustainable Drainage Systems (SuDS) within the proposed development, these proposed SuDS features are listed below;

- i) Permeable Paving: Car parking spaces shall be constructed of permeable paving to allow for local infiltration.
- ii) Tree Pits: SuDS Tree pits shall be incorporated to increase biodiversity and amenity. Tree pits shall collect and attenuate water runoff and provide improvements to water quality.

- iii) The use of low water usage sanitary appliances to reduce the reliance on potable water supplies.
- iv) Attenuation storage with flow control, sized to contain a 1-in-100-year storm event and increased by 20% for predicted climate change effects, to limit discharge from the site during extreme rainfall events.

3.4 Stormwater Treatment

Land use is the primary influencing factor in the quality of urban surface water runoff and can therefore be used to represent the likely significance of the expected pollutant concentrations generated during rainfall events.

Considering the nature of the scheme, which is a small-sized residential area with low traffic roads, it does not pose a significant threat to the receiving water bodies. Therefore, the Simple Index Approach (SIA) described in chapter 26 of C753 -The SuDS Manual will be applied in this case.

To implement this method effectively, the steps described below will be followed.

- **Step 1:** Allocate suitable pollution hazard indices to the proposed land use.
- **Step 2:** Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index determined in Step 1.
- **Step 3:** Where the discharge is to protected surface waters or groundwater, a more precautionary approach is needed – not applicable in this case.



STEP 1: The following pollution hazard indices are anticipated for the subject development site. Refer to **Table 1**.

Table 1 - Pollution Hazard Indices (Extract from Table 26.2 of CIRIA C753 The SuDS Manual)				
Land Use	Pollution Hazard Level	Total Suspended Solids	Metals	Hydro-carbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, low traffic roads.	Low	0.5	0.4	0.4

STEP 2: In order to ensure adequate treatment, the selected SuDS components must have a total pollution mitigation index that is equal to or greater than the pollution hazard index for each contaminant type.

Total SuDS mitigation index \geq Pollution Hazard Index

As the principal destination of the runoff is to a surface water, but small amounts of infiltration may occur from the permeable pavement areas and the tree pits, then the groundwater indices should be used for the discharge to groundwater (as provided in Table 26.4 of The SuDS Manual). These indices are more stringent than the ones applicable to discharging to a surface water body. Refer to **Table 2**.

Table 2 - Pollution Mitigation Indices for discharges to groundwater Extract from Table 26.4 of CIRIA C753 The SuDS Manual			
SuDS Component	Total Suspended Solids	Metals	Hydro-carbons
Tree Pit (Bioretention system)	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7

If the mitigation index of an individual component is insufficient, additional components arranged in series will be required, where:

Total SuDS mitigation index = mitigation index₁ + 0.5 (mitigation index₂)

Driveways and low traffic roads

Run-off from the development driveways and low-traffic roads shall be treated by the proposed permeable pavement and tree pits. The pollution mitigation index for each contaminant is as follows:

- TSS: Pollution Mitigation Index= $0.7 + 0.5 * 0.8 = 1.1 \geq 0.5$
- Metals: Pollution Mitigation Index= $0.6+0.5 * 0.8 = 1.0 \geq 0.4$
- Hydrocarbons: Pollution Mitigation Index = $0.7 + 0.5 *0.8 = 1.1 \geq 0.4$

Since all the pollution mitigation indices for each type of contaminant are greater than the pollution hazard indices, the required level of treatment is satisfactorily achieved.

Conventional Roofs:

Runoff from conventional roofs will be directed to permeable paving that passes through the front of each dwelling. As such, only the Pollution Mitigation indices from permeable paving will be considered in the calculations:

- TSS: Pollution Mitigation Index= $0.7 \geq 0.2$
- Metals: Pollution Mitigation Index= $0.6 \geq 0.2$
- Hydrocarbons: Pollution Mitigation Index = $0.7 \geq 0.05$

Since all the pollution mitigation indices for each type of contaminant type are greater than the pollution hazard indices, the required level of treatment is satisfactorily achieved.

4.0 FOUL DRAINAGE

4.1 Existing Foul Drainage Infrastructure

Irish Water drainage records do not indicate any public foul sewer in the proximity to the subject site.

However, a topographical survey was carried out in and around the development site. The survey results indicate that there is an existing 225mm foul sewer to the south on the development site.

4.2 Foul Effluent Generation

The proposed development comprises of 18no. residential dwellings.

The Irish Water *Code of Practice for Wastewater Infrastructure* specifies an average foul effluent flow rate of 165 litres per person per day for domestic dwellings (150 litres per person per day, plus a 10% allowance for external infiltration) and an average occupancy of 2.7 persons per residential unit. The development's maximum design population is therefore 49 people (49 pe), and the maximum average effluent flow (dry weather flow or DWF) to be generated by the proposed development may be calculated as:

$$\text{DWF} = 49\text{pe} \times 165\text{l/day/pe} = 8,085\text{l/day} = 0.093\text{l/s}$$

The peak effluent flow (Design Flow) is calculated by applying a domestic peak factor (Pf_{DOM}) of 6;

$$\text{Design Flow} = \text{DWF} \times Pf_{DOM} = 0.093\text{l/s} \times 6 = 0.561\text{l/s}$$

4.3 Proposed Foul Drainage Arrangements and Outfall

All foul effluent generated from the proposed development shall be collected in a separate foul pipe of 150mm diameter and flow under gravity to the existing 225mm foul sewer to the south-west of the development site. A wayleave of 3m either side shall be maintained along the proposed foul sewer until the final outfall into the existing foul sewer.

The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

A Pre-Connection Enquiry has been made to Irish Water in relation to the proposed development and Confirmation of Feasibility has been received. Please refer to **Appendix B** for Confirmation of Feasibility from Irish Water and CS Consulting drawing **BRUF-CSC-ZZ-XX-DR-C-0002** for the proposed foul drainage layout for the development site.



5.0 POTABLE WATER SUPPLY

5.1 Existing Potable Water Infrastructure

Irish Water drainage records indicate an existing 100mm uPVC potable watermain to the south of the development site.

5.2 Potable Water Demand

The proposed development comprises of 18no. residential dwellings.

The Irish Water *Code of Practice for Water Infrastructure* specifies an average potable water demand of 150 litres per person per day for domestic dwellings, and an average occupancy of 2.7 persons per residential unit. The development's maximum design population is therefore 49 people (49 pe), and the average potable water demand of the proposed development may be calculated as;

$$\text{Avg. Demand} = 49pe \times 150l/day/pe = 7,350l/day = 0.085l/s$$

The peak potable water demand is calculated by applying a domestic peak factor (Pf_{DOM}) of 5, in accordance with the Irish Water *Code of Practice for Water Infrastructure*;

$$\text{Peak Demand} = \text{Avg. Demand} \times Pf_{DOM} = 0.085l/s \times 5 = 0.425l/s$$

5.3 Proposed Water Supply Arrangement

It is proposed to provide a new watermain for the development. It is proposed to take the supply of the existing 100mm uPVC watermain that runs along Brugh na Deise to the south of the development site.

The watermain network for the development shall be in accordance with the Building Regulations and to the requirements and specifications of Irish Water.

A Pre-Connection Enquiry has been made to Irish Water in relation to the proposed development and Confirmation of Feasibility has been received. Please refer to **Appendix B** for Confirmation of Feasibility from Irish Water and CS Consulting drawing **BRUF-CSC-ZZ-XX-DR-C-0003** for the proposed watermain layout for the development site.

6.0 ACCESS, LAYOUT, SERVICING, PEDESTRIANS & CYCLISTS, PARKING

6.1 Development Access

The proposed development's vehicular/ pedestrian access shall be located along the southern boundary of the site. All the residential units shall be directly accessed via the internal road network.

The development access shall connect in to the existing Brugh na Deise.

6.2 Internal Site Layout

The internal road network provides access to a total of 30no. car parking spaces. The car parking spaces shall be placed parallel and perpendicular to the internal road network.

The internal road network shall be 5.5m wide with 2.25m footpath present on either side of the carriageway. All the dwelling units shall be directly access via the internal road network.

Refer to CS Consulting Drawing no. **BRUF-CSC-ZZ-XX-DR-C-0001** for internal road layout of the proposed development.

6.3 Pedestrians & Cyclists

Pedestrian and cyclist access to the development shall be accommodated via the main access on Brugh na Deise, at the southern boundary of the development site. The internal road network shall also comprise of a cul-de-sac at the site northern boundary which shall accommodate for turning manoeuvres of service vehicles and fire tender.

Within the development, raised and segregated footpaths 2.25m in width shall be provided along both sides of the internal access road.

6.4 Swept Path Analysis

Swept path analyses have been carried out for both fire tenders and refuse vehicles accessing and manoeuvring within the proposed development. These analyses, provided on drawing **BRUF-CSC-ZZ-XX-DR-C-0008** within this planning application, indicate that the design of the development accesses and internal layout can accommodate these vehicle movements where required.

6.5 Car Parking Provision

The car parking provision for the proposed development has been assessed in accordance with the Limerick Development Plan 2022-2028, which defines the standard maximum car parking provision for new developments by land use type. **Table 3** shows the car parking standards applicable for the proposed development and illustrates that the proposed car parking provision does not exceed the maximum permitted by the Local Authority development plan.

Table 3 – Car Parking Provision

Land Use	Car Parking Maximum	Quantum	Max. Parking Provision	Proposed Provision
Dwelling <3 bedroom	1.5 spaces per unit	10 units	15 spaces	14 spaces
Dwelling 3 bedroom +	2 spaces per unit	8 units	16 spaces	16 spaces
Total			31 spaces	30 spaces

The proposed development shall include a total of 30no. car parking spaces, located along the internal road network of the proposed development.

6.6 Disabled-Accessible Car Parking

The *Limerick Development Plan 2022-2028* does not specify any minimum requirement for the provision of disabled-accessible parking in new developments, however, the development plan in section 7.10.4 mentions that 'A proportion of all parking spaces should be provided for parking for disabled people and the charging of electric vehicles'.

The proposed development shall include a total of 7no. disabled-accessible spaces which equates excess to 20% of the total car parking spaces provided within the proposed development.

6.7 Electric Vehicle Charging Provision

As per the *Limerick Development Plan 2022-2028* a minimum of 1no. car parking spaces for every 5no. car parking spaces provided should be equipped with one fully functional EV Charging Point.

Within the proposed development facilities for the charging of battery electric vehicles (BEVs) shall be provided at 10no. parking spaces, representing more than 20% of the development's car parking provision, therefore, satisfying the requirement set out in *Limerick Development Plan 2022-2028*. All remaining internal car parking spaces within the development shall be 'future-proofed' by the inclusion of ducting and/or cabling to permit the rapid future installation of BEV charging points, as defined in the ESB ecars specification document no. 18017 (*Public Charge Points*, last reviewed February 2012).

6.8 Bicycle Provision

The bicycle parking for the proposed development has been assessed in accordance with the *Limerick Development Plan 2022-2028*, which defines minimum standard bicycle parking provision for new developments by land

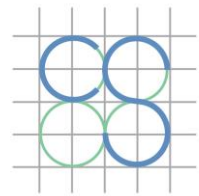
type. **Table 4** below shows the standards applicable for the proposed development.

Table 4 – Bicycle Parking Provision

Use	Cycle Parking Minimum	Quantum	Minimum Provision	Proposed Provision
Dwelling <3 bedroom (Long-term)	1 space per unit	10 units	10 spaces	10 spaces
Dwelling <3 bedroom (Short stay)	1 space per 2 units	10 units	5 spaces	14 spaces
Dwelling 3 bedroom + (Long-term)	2 spaces per unit	8 units	16 spaces	16 spaces
Dwelling 3 bedroom + (Short-stay)	1 space per 2 units	8 units	4 spaces	12 spaces
TOTALS			35 spaces	52 spaces


The proposed development shall comprise a total of 52no. bicycle parking spaces, of which 26no. spaces shall be long-term spaces.

Each 1-bedroom and 2 -bedroom units shall be provided with 1no. bicycle parking spaces within the curtilage of the house. Each 3-bedroom and 4-bedroom units shall be provided with 2no. cycle spaces within the curtilage of the house. In addition, the development shall also provide a total of 26no. short-stay bicycle spaces to facilitate for the visitors of the development.



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Appendix A: Attenuation Calculations

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Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm









Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	10	PIMP (%)	100
M5-60 (mm)	15.700	Add Flow / Climate Change (%)	0
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	5.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	250

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	40.381	0.808	50.0	0.189	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	39.507	0.617	64.0	0.150	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	29.750	0.496	60.0	0.021	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	8.145	0.033	250.0	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	31.449	0.126	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	84.095	0.336	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	59.272	0.237	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	59.662	0.239	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	4.36	100.000	0.189	0.0	0.0	0.0	1.85	73.7	25.5
S1.001	50.00	4.70	99.117	0.338	0.0	0.0	0.0	1.97	139.1	45.8
S2.000	50.00	4.29	98.950	0.021	0.0	0.0	0.0	1.69	67.3	2.8
S1.002	50.00	4.83	98.379	0.396	0.0	0.0	0.0	0.99	70.0	53.7
S1.003	50.00	5.36	98.347	0.396	0.0	0.0	0.0	0.99	70.0	53.7
S1.004	50.00	6.78	98.221	0.396	0.0	0.0	0.0	0.99	70.0	53.7
S1.005	50.00	7.78	97.884	0.396	0.0	0.0	0.0	0.99	70.0	53.7
S1.006	50.00	8.78	97.647	0.396	0.0	0.0	0.0	0.99	70.0	53.7

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.189	0.189	0.189
1.001	User	-	100	0.150	0.150	0.150
2.000	User	-	100	0.021	0.021	0.021
1.002	User	-	100	0.037	0.037	0.037
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.396	0.396	0.396

Free Flowing Outfall Details for Storm


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.006	S	99.890	97.409	97.330	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	30.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	1
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	10	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.700	Storm Duration (mins)	30
Ratio R	0.300		

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Online Controls for Storm


Hydro-Brake® Optimum Manhole: S4, DS/PN: S1.003, Volume (m³): 2.4

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	98.347
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0	Kick-Flo®	0.599	1.6
Flush-Flo™	0.296	1.9	Mean Flow over Head Range	-	1.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Storage Structures for Storm

Tank or Pond Manhole: S4, DS/PN: S1.003

Invert Level (m) 98.347

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	200.0	1.000	200.0	1.001	0.0

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.300
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	15.700	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

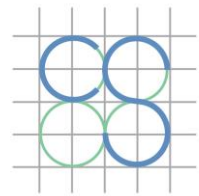
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	100	+0%	100/15 Summer				100.499
S1.001	S2	15 Winter	100	+0%	100/15 Summer				99.624
S2.000	S3	960 Winter	100	+0%	100/180 Winter				99.577
S1.002	S3	960 Winter	100	+0%	30/15 Summer				99.647
S1.003	S4	960 Winter	100	+0%	1/480 Winter				99.561
S1.004	S5	720 Winter	100	+0%					98.256
S1.005	S6	720 Winter	100	+0%					97.919
S1.006	S7	720 Winter	100	+0%					97.682

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.274	0.000	1.04		72.5	SURCHARGED	
S1.001	S2	0.207	0.000	1.00		129.6	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)				
S2.000	S3	0.402	0.000	0.01			0.7	SURCHARGED	
S1.002	S3	0.968	0.000	0.24			12.7	SURCHARGED	
S1.003	S4	0.915	0.000	0.03			2.1	SURCHARGED	
S1.004	S5	-0.265	0.000	0.03			2.1	OK	
S1.005	S6	-0.265	0.000	0.03			2.1	OK	
S1.006	S7	-0.265	0.000	0.03			2.1	OK	



CS CONSULTING
GROUP

Appendix B: Irish Water Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Fionnán De Búrca
19-22 Dame Street
Dublin
D02E267

3 April 2023

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

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

www.water.ie

**Our Ref: CDS23002162 Pre-Connection Enquiry
Brugh na nDeise, Ardykeohane, Bruff, Limerick**

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 18 unit(s) at Brugh na nDeise, Ardykeohane, Bruff, Co. Limerick, (the **Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Irish Water
-
- **Wastewater Connection** - Feasible Subject to upgrades
- In order to complete the proposed connection at the Premises, the Uisce Éireann wastewater network will have to be extended by approximately 125m. Uisce Éireann currently does not have any plans to extend its network in this area. Should you wish to consider extending the wastewater network infrastructure to a point to connect to the Uisce Éireann network, please contact Irish Water.
-
- Where it is proposed to connect to the public wastewater network by traversing third party lands, a wayleave shall be required in the interest of Uisce Éireann along the length of the proposed network,

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

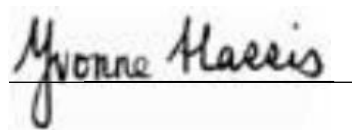
Where can you find more information?

- **Section A** - What is important to know?
- **Section B** - Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit www.water.ie/connections, email newconnections@water.ie or contact 1800 278 278.

Yours sincerely,

A handwritten signature in black ink that reads "Yvonne Harris". The signature is written in a cursive style and is positioned above a thin horizontal line.

Yvonne Harris
Head of Customer Operations

Section A - What is important to know?

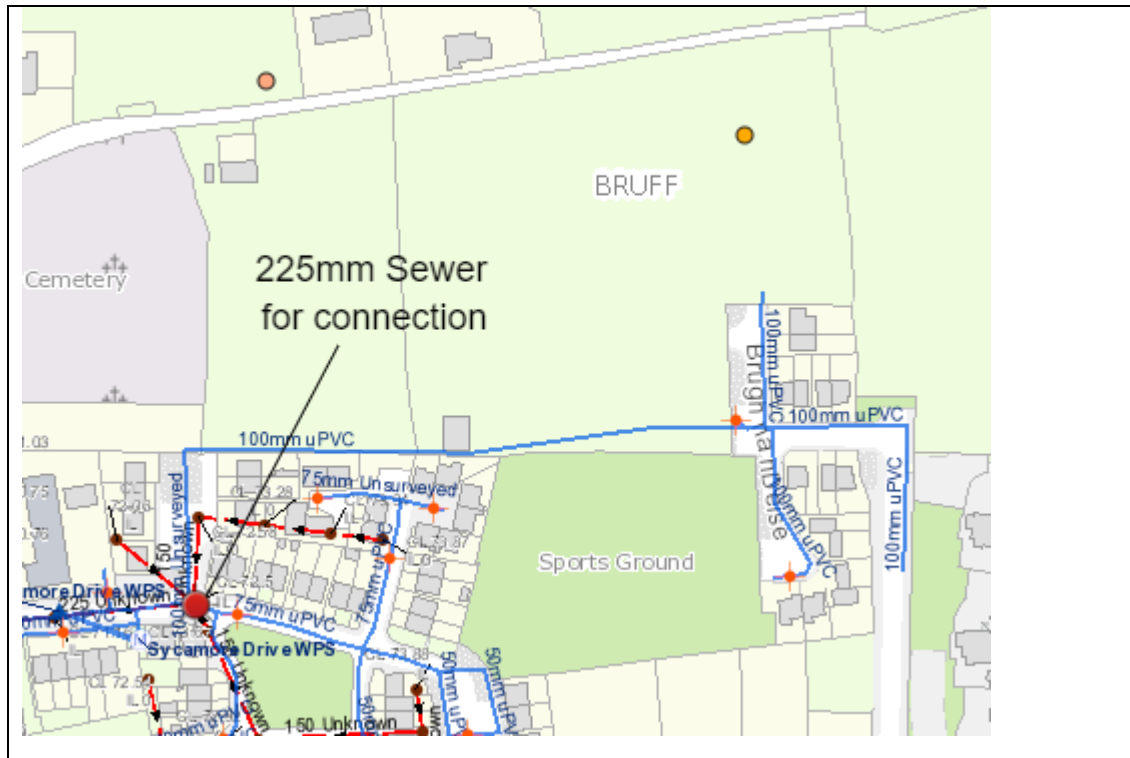
What is important to know?	Why is this important?
<p>Do you need a contract to connect?</p>	<ul style="list-style-type: none"> • Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application <u>and be granted and sign</u> a connection agreement with Irish Water.
<p>When should I submit a Connection Application?</p>	<ul style="list-style-type: none"> • A connection application should only be submitted after planning permission has been granted.
<p>Where can I find information on connection charges?</p>	<ul style="list-style-type: none"> • Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
<p>Who will carry out the connection work?</p>	<ul style="list-style-type: none"> • All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. <p>*Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works</p>
<p>Fire flow Requirements</p>	<ul style="list-style-type: none"> • The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • What to do? - Contact the relevant Local Fire Authority
<p>Plan for disposal of storm water</p>	<ul style="list-style-type: none"> • The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • What to do? - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
<p>Where do I find details of Irish Water's network(s)?</p>	<ul style="list-style-type: none"> • Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

<p>What are the design requirements for the connection(s)?</p>	<ul style="list-style-type: none"> The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with <i>the Irish Water Connections and Developer Services Standard Details and Codes of Practice</i>, available at www.water.ie/connections
<p>Trade Effluent Licensing</p>	<ul style="list-style-type: none"> Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ <p>**trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)</p>

Section B – Details of Irish Water’s Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email

datarequests@water.ie



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Note: The information provided on the included maps as to the position of Irish Water’s underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water’s network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water’s underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water’s underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.