OBA | CONSULTING
CIVIL & STRUCTURAL
ENGINEERS

# ENGINEERING DRAINAGE REPORT FOR PLANNING SUBMISSION

## Belturbet Community & Enterprise Hub,
## Main Street,
## Belturbet,
## Co. Cavan

**Reference:** 99-07
**Date:** 02 February 2024

ENGINEERS IRELAND

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**Proposed Belturbet Community & Enterprise Hub, Main Street, Belturbet, Co. Cavan**

**Ref: 99-07**

**Drainage Summary for the Proposed Belturbet Community & Enterprise Hub, Main Street, Belturbet, Co. Cavan**

## 1.0 General

The proposal is for the alterations and extension of the existing 'Dinkins Bakery', and provision of a new commercial Community & Enterprise Hub located on Main Street, Belturbet.

## 2.0 Foul Water Drainage

Currently, the wastewater and surface water from the existing buildings discharge as a combined system to the foul sewer on Patrick Street, to the rear.

It is proposed to discontinue and grub up the existing combined drains and replace with dedicated foul drains, with a new 100mm diameter uPVC foul outfall drain discharging to the existing 150mm diameter foul sewer on Patrick Street to the rear of the site.

The final manhole is to be built in accordance Irish Water standards.

All new foul drains shall be 100mm diameter uPVC at gradients of minimum 1:60 in accordance with Part H of the Building Regulations 2010, unless otherwise noted.

Refer to OBA drawing numbers 99-07-C01 and 99-07-C02, for further details.

## 3.0 Surface Water Drainage

As mentioned above, all surface water discharges to the existing combined drain with the exception of the front pitched roof, which discharges to a concrete channel and aco drain in the public footpath area.

Available options for Sustainable Urban Drainage Systems (SUDS) are limited due to small area of the site and the intention to match the existing pitched roof structure with new pitched roof(s).

New flat roofs are to be provided with *Bauder sedum green roof.*

It is proposed to provide a 310-litre *rainwater harvesting tank*, supplying the Community & Enterprise Hub wc's. Overflow from the rainwater harvesting tank will be attenuated in a *RC SW attenuation tank*, providing sufficient attenuation to store the 100-year return storm with an additional allowance of 20% for climate change. Discharge is to be limited through the use of a hydrobrake, located in the final outfall manhole. It is also proposed to provide a new 100mm diameter uPVC SW outfall drain discharging to the existing 300 diameter SW sewer on Patrick Street to the rear of the site.

Please refer to the attached attenuation related calculations and details for full details of the attenuation proposal.

All new surface water drains shall be 100mm diameter uPVC at minimum gradient of 1:80, unless otherwise noted, and are designed and to be installed in accordance with Building Regulations 2010 and the Greater Dublin Regional Code of Practice for Drainage Work. All drainage works shall be in accordance with the requirements of Cavan County Council.

Refer to drawing no. 99-07-C01 and 99-04-C02 for further clarity.

**4.0 Water Connection**

It is also proposed to retain the existing 25mm diameter service connection, including Irish Water compliant boundary box, feeding from the existing 150 diameter AC watermain on Main Street.

References: Building Regulations 2010, Part H, Drainage and Wastewater disposal
Greater Dublin Regional Code of Practice for Drainage Works
Greater Dublin Strategic Drainage Study
Irish Water 'Water Code of Practice'. And
Irish Water 'Waste-water Code of Practice'.

BAUDER
making roofs secure.

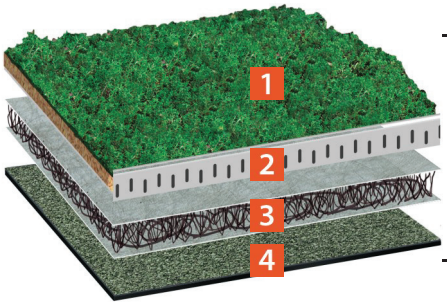
Revision: October 2022 V3

# SYSTEM SUMMARY

# BauderGREEN XF301 lightweight sedum system

## Sedum Blanket Solution

BauderGREEN XF301 lightweight sedum system is an ultra-light weight green roof solution. Typically used on roofs where heavier substrate solutions are not an option. On roofs laid to a fall of ‹2° the product can be laid directly onto the waterproofing. When laid on flat roofs ( below 2°) an additional drainage mat BauderGREEN SDF mat is fitted (layer 3 below). BauderGREEN XF301 also contains a moisture mat which retains up to 5 litre of water/m². The vegetation grown on the blanket is a broad mix of sedum varieties.




| Product | Description | Thickness | Weight |
|---|---|---|---|
| 1 BauderGREEN XF301 sedum blanket* | A single layer sedum system, GRO compliant substrate is held within a nylon mesh with attached moisture mat. The sedum blanket is grown for circa 12 months and contains up to 17 species of sedum. | 28mm | 44kg/m² |
| 2 BauderGREEN AL 40 | A bespoke edge trim which retains the XF301 system and secures the system to the underlying waterproofing. | N/A | N/A |
| 3 BauderGREEN SDF mat | Multifunctional drainage, filtration and protection layer manufactured from ultraviolet resistant nylon woven loops, which are thermally bonded to geo-textile filter fleece facings. (Only required on roofs below 2° ) | 20mm | 1kg/m² |
| 4 Bauder's underlying waterproofing system | Bauder's underlying waterproofing system, options for bituminous membrane, Hot Melt, Single ply or Cold applied liquid systems. | N/A | N/A |
| **Green Roof Build up (fully saturated, excludes the waterproofing)** | | **48mm** | **45kg/m²** |

*Bauder also produce deeper sedum & wildflower blankets solutions

**Where to specify:**

Ideally suited to lightweight wooden roof decks or any building where weight and depth of system is critical.

**Please note:** All green roofs require water during times of drought. Bauder recommend that the watering and maintenance of this roof is considered and addressed during its design.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# Klargester Gamma
## Fully Integrated Rainwater Harvesting System

### Gamma Direct System

The Direct System is ideal for domestic applications. This system is used where it is impractical to have a header tank, for example in homes that have converted attic spaces and no room for a header tank. Therefore, filtered rainwater is pumped direct from the holding tank to the various appliances.

If the storage tank has a low level of rainwater, there is a small automatic charge of mains water into the tank to ensure the system never runs dry. The main advantage of this system is that rainwater is delivered to the appliances at mains pressure or higher.

### Gamma Gravity System

The Gravity System is also suitable for domestic applications. It has a major advantage in that in the event of a power failure on site (or the rain stocks running dry) the system will automatically switch to mains water supply to ensure a continuity of service.

The gravity system requires a header tank to complete the package. Klargester supply a header tank as an optional extra which contains two independent valves operating both the mains and rainwater supply(we recommend a Klargester header tank is used). The water from the header tank will flow by gravity to the serviced appliances. The system will always draw from the rainwater supply first.

### Uses

- WC Flushing
- Vehicle Washing
- Garden and Landscape Watering
- Domestic Laundry

### Benefits

- Can reduce water consumption in domestic applications by up to 50%
- Easy to install and simple to maintain
- 'Fit and Forget' system, ensuring an automatic supply of harvested rainwater
- Shallow Dig—the Gamma is designed with easy, affordable installation in mind
- Peashingle backfill available—no costly excavation and soil diposal necessary (dependent upon site conditions)
- Fully compliant—Gamma is tested in accordance with BS 8515:2009 standards


### Choosing and ordering your Gamma System made simple

| Model | Tank Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Capacity | Standard Overall Height | Standard Inlet Invert* | Standard Outlet Invert* | Length | Width |
| **Gravity System** | | | | | | |
| GRW080 | 2,350 Ltrs | 1,770mm | 720mm | 750mm | 3,000mm | 1,180mm |
| GRW110 | 3,100 Ltrs | 2,260mm | 720mm | 750mm | 2,480mm | 1,130mm |
| GRW160 | 4,600 Ltrs | 2,260mm | 720mm | 750mm | 3,360mm | 1,215mm |
| **Direct System** | | | | | | |
| GRW080 | 2,350 Ltrs | 1,768mm | 720mm | 750mm | 3,000mm | 1,180mm |
| GRW110 | 3,100 Ltrs | 2,260mm | 720mm | 750mm | 2,480mm | 1,130mm |
| GRW160 | 4,600 Ltrs | 2,260mm | 720mm | 750mm | 3,360mm | 1,215mm |

* Includes tank neck - adjustable to suit required invert.

**01 The Gravity System**

The Gravity System uses an elevated header tank to store filtered water after the main tank.

**02 The Direct System**

The Direct System pumps water from the main storage tank and is used where a header tank is impractical.

**Storm Water Attenuation Calculations**

Total Site Area = 545 $m^2$

Areas contributing to SW Run-off:

| Description | Finish | Area ($m^2$) | Percentage run-off (%) | Equivalent run-off area ($m^2$) |
|---|---|---|---|---|
| Roof | sedum | 231 | 80 | 184.8 |
| Existing pitched Roof | tiles | 74 | 90 | 66.6 |
| Ramps / landings | concrete | 208 | 80 | 166.4 |
| Garden | landscaped | 32 | 30 | 9.6 |
| Equivalent impermeable area: | | | | **427.4** |

Greenfield runoff rate (Qbar) = 0.45 l/s (HR Wallingford)
However, reference to GDSDS 6.8.2.3 recommends a minimum throttle size of 75mm for private developments, based on this and a maximum head achievable in the attenuation tank of 1.0m, the maximum Permissible outflow = **2.0 l/s** (Hydro Int.)

**100 year storm**

Permissible Volume (l)= Actual Achievable Outflow (l/s) x time (s)

Actual Volume (l)= (Equivalent Impermeable Area x depth of rainfall)

Storage capacity (l)= Actual - Permissible Volumes

| Duration | Rainfall | Permissible | Actual | Store |
|---|---|---|---|---|
| min | mm | l | l | l |
| 15 | 26.7 | 1800.00 | 11411.58 | 9611.58 |
| 30 | 31.2 | 3600.00 | 13334.88 | 9734.88 |
| 60 | 36.4 | 7200.00 | 15557.36 | 8357.36 |
| 120 | 42.5 | 14400.00 | 18164.50 | 3764.50 |
| 240 | 49.7 | 28800.00 | 21241.78 | -7558.22 |
| 360 | 54.4 | 43200.00 | 23250.56 | -19949.44 |
| 720 | 63.6 | 86400.00 | 27182.64 | -59217.36 |
| 1440 | 74.3 | 172800.00 | 31755.82 | -141044.18 |

Rainfall is Site specific, Met Eireann

From table above, required storage volume is 9.73 $m^3$
Allow 20% for climate change, volume required = 11.68 $m^3$

Hydrobrake discharge = 2.00 l/s

# Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

| | |
|---|---|
| **Calculated by:** | Alan Manthe |
| **Site name:** | Dinkins |
| **Site location:** | Belturbet |

## Site Details

| | |
|---|---|
| **Latitude:** | 54.10121° N |
| **Longitude:** | 7.44409° W |
| **Reference:** | 1564718501 |
| **Date:** | Feb 05 2024 17:00 |

This is an estimation of the greenfield runoff rates that are used 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). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Runoff estimation approach

IH124

## Site characteristics

**Total site area (ha):** 0.1

## Methodology

| | |
|---|---|
| **$Q_{BAR}$ estimation method:** | Calculate from SPR and SAAR |
| **SPR estimation method:** | Calculate from SOIL type |

## Soil characteristics

| | Default | Edited |
|---|---|---|
| **SOIL type:** | 3 | 3 |
| **HOST class:** | N/A | N/A |
| **SPR/SPRHOST:** | 0.37 | 0.37 |

## Hydrological characteristics

| | Default | Edited |
|---|---|---|
| **SAAR (mm):** | 1035 | 1035 |
| **Hydrological region:** | 13 | 13 |
| **Growth curve factor 1 year:** | 0.85 | 0.85 |
| **Growth curve factor 30 years:** | 1.65 | 1.65 |
| **Growth curve factor 100 years:** | 1.95 | 1.95 |
| **Growth curve factor 200 years:** | 2.15 | 2.15 |

## Notes

### (1) Is $Q_{BAR}$ < 2.0 l/s/ha?

When $Q_{BAR}$ is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

### (2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

### (3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

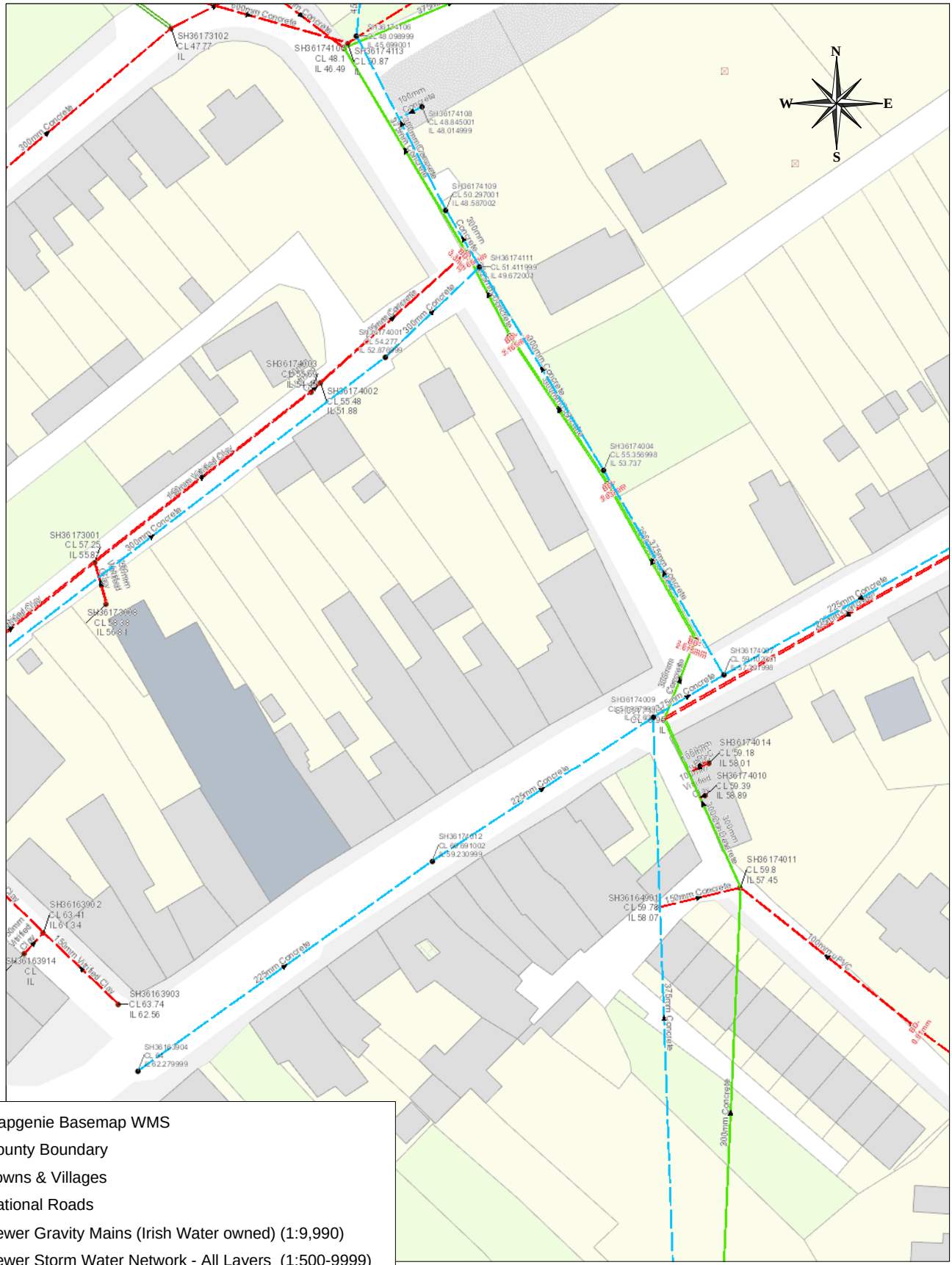
| | Default | Edited |
|---|---|---|
| **$Q_{BAR}$ (l/s):** | 0.45 | 0.45 |
| **1 in 1 year (l/s):** | 0.39 | 0.39 |
| **1 in 30 years (l/s):** | 0.75 | 0.75 |
| **1 in 100 year (l/s):** | 0.89 | 0.89 |
| **1 in 200 years (l/s):** | 0.98 | 0.98 |

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 236421, Northing: 317040,

| | Interval | | Years | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DURATION | 6months, | 1year, | 2, | 3, | 4, | 5, | 10, | 20, | 30, | 50, | 75, | 100, | 150, | 200, | 250, | 500, |
| 5 mins | 2.7, | 3.9, | 4.5, | 5.5, | 6.2, | 6.7, | 8.4, | 10.3, | 11.6, | 13.4, | 15.0, | 16.3, | 18.2, | 19.8, | 21.0, | N/A , |
| 10 mins | 3.8, | 5.4, | 6.3, | 7.7, | 8.6, | 9.3, | 11.6, | 14.3, | 16.1, | 18.7, | 20.9, | 22.7, | 25.4, | 27.5, | 29.3, | N/A , |
| 15 mins | 4.5, | 6.4, | 7.4, | 9.0, | 10.1, | 10.9, | 13.7, | 16.9, | 19.0, | 21.9, | 24.6, | 26.7, | 29.9, | 32.4, | 34.5, | N/A , |
| 30 mins | 5.8, | 8.1, | 9.3, | 11.2, | 12.5, | 13.4, | 16.6, | 20.2, | 22.6, | 25.9, | 28.9, | 31.2, | 34.7, | 37.4, | 39.7, | N/A , |
| 1 hours | 7.5, | 10.3, | 11.7, | 13.9, | 15.4, | 16.5, | 20.2, | 24.2, | 26.9, | 30.6, | 33.9, | 36.4, | 40.3, | 43.3, | 45.7, | N/A , |
| 2 hours | 9.7, | 13.0, | 14.8, | 17.3, | 19.0, | 20.3, | 24.5, | 29.1, | 32.1, | 36.2, | 39.8, | 42.5, | 46.8, | 50.0, | 52.6, | N/A , |
| 3 hours | 11.2, | 15.0, | 16.9, | 19.7, | 21.5, | 22.9, | 27.4, | 32.3, | 35.5, | 39.9, | 43.7, | 46.6, | 51.0, | 54.4, | 57.1, | N/A , |
| 4 hours | 12.5, | 16.5, | 18.5, | 21.5, | 23.5, | 25.0, | 29.7, | 34.9, | 38.2, | 42.7, | 46.7, | 49.7, | 54.3, | 57.7, | 60.6, | N/A , |
| 6 hours | 14.6, | 19.0, | 21.2, | 24.4, | 26.6, | 28.2, | 33.3, | 38.8, | 42.3, | 47.1, | 51.3, | 54.4, | 59.2, | 62.8, | 65.8, | N/A , |
| 9 hours | 16.9, | 21.8, | 24.2, | 27.8, | 30.1, | 31.8, | 37.3, | 43.1, | 46.9, | 51.9, | 56.3, | 59.6, | 64.6, | 68.4, | 71.4, | N/A , |
| 12 hours | 18.8, | 24.0, | 26.6, | 30.4, | 32.8, | 34.6, | 40.4, | 46.5, | 50.4, | 55.7, | 60.2, | 63.6, | 68.7, | 72.6, | 75.7, | N/A , |
| 18 hours | 21.9, | 27.6, | 30.5, | 34.5, | 37.1, | 39.1, | 45.2, | 51.7, | 55.8, | 61.4, | 66.1, | 69.6, | 75.0, | 79.0, | 82.2, | N/A , |
| 24 hours | 24.4, | 30.5, | 33.5, | 37.8, | 40.5, | 42.6, | 49.0, | 55.8, | 60.0, | 65.8, | 70.6, | 74.3, | 79.7, | 83.8, | 87.2, | 98.3, |
| 2 days | 31.6, | 38.4, | 41.6, | 46.2, | 49.0, | 51.2, | 57.8, | 64.6, | 68.9, | 74.5, | 79.2, | 82.7, | 87.9, | 91.8, | 95.0, | 105.4, |
| 3 days | 37.8, | 45.0, | 48.5, | 53.2, | 56.3, | 58.5, | 65.3, | 72.3, | 76.5, | 82.2, | 86.9, | 90.4, | 95.6, | 99.4, | 102.5, | 112.6, |
| 4 days | 43.4, | 51.0, | 54.6, | 59.6, | 62.7, | 65.0, | 72.0, | 79.1, | 83.5, | 89.1, | 93.9, | 97.4, | 102.5, | 106.3, | 109.4, | 119.4, |
| 6 days | 53.5, | 61.8, | 65.7, | 71.0, | 74.3, | 76.8, | 84.1, | 91.4, | 95.8, | 101.6, | 106.4, | 109.9, | 115.1, | 118.9, | 121.9, | 131.8, |
| 8 days | 62.9, | 71.7, | 75.8, | 81.4, | 84.8, | 87.4, | 94.9, | 102.4, | 106.9, | 112.8, | 117.7, | 121.2, | 126.4, | 130.2, | 133.2, | 143.0, |
| 10 days | 71.7, | 81.0, | 85.3, | 91.0, | 94.6, | 97.2, | 104.9, | 112.6, | 117.2, | 123.1, | 128.0, | 131.6, | 136.8, | 140.6, | 143.6, | 153.3, |
| 12 days | 80.2, | 89.8, | 94.3, | 100.2, | 103.8, | 106.5, | 114.4, | 122.2, | 126.8, | 132.8, | 137.8, | 141.3, | 146.5, | 150.3, | 153.3, | 163.0, |
| 16 days | 96.4, | 106.6, | 111.3, | 117.5, | 121.3, | 124.0, | 132.2, | 140.1, | 144.8, | 150.9, | 155.9, | 159.5, | 164.6, | 168.4, | 171.4, | 181.0, |
| 20 days | 111.9, | 122.6, | 127.4, | 133.8, | 137.7, | 140.5, | 148.8, | 156.8, | 161.6, | 167.7, | 172.7, | 176.3, | 181.4, | 185.2, | 188.1, | 197.6, |
| 25 days | 130.7, | 141.7, | 146.7, | 153.2, | 157.2, | 160.1, | 168.5, | 176.6, | 181.4, | 187.4, | 192.4, | 195.9, | 201.1, | 204.8, | 207.7, | 217.0, |

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

# Storm water and Waste Water




- Mapgenie Basemap WMS
- County Boundary
- Towns & Villages
- National Roads
- Sewer Gravity Mains (Irish Water owned) (1:9,990)
- Sewer Storm Water Network - All Layers (1:500-9999)
- Surface Water Mains (1:22,000)
- Storm Water Network - All Layers (1:9,999)


Cavan County Council
Comhairle Chontae an Chabháin

Farnham Street,
Cavan
049 4378300


**Project:**



| | |
|---|---|
| Drawn By: | |
| Survey By: | |
| Date: | 25/01/24 |
| Scale: | 1:1000 |


N

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2. Whilst every care has been taken in its compilation, Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions.This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network 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.





# Waste Water Network

Uisce Éireann
Irish Water

## Legend

**Sewer Gravity Mains (Irish Water owned)**

**Liquid Type**

- Combined
- Foul

**Sewer Pressurized Mains (Irish Water owned)**

**Liquid Type**

- Combined

**Sewer Manholes**

**Manhole Type**

- Standard

**Sewer Fittings**

**Fitting Type**

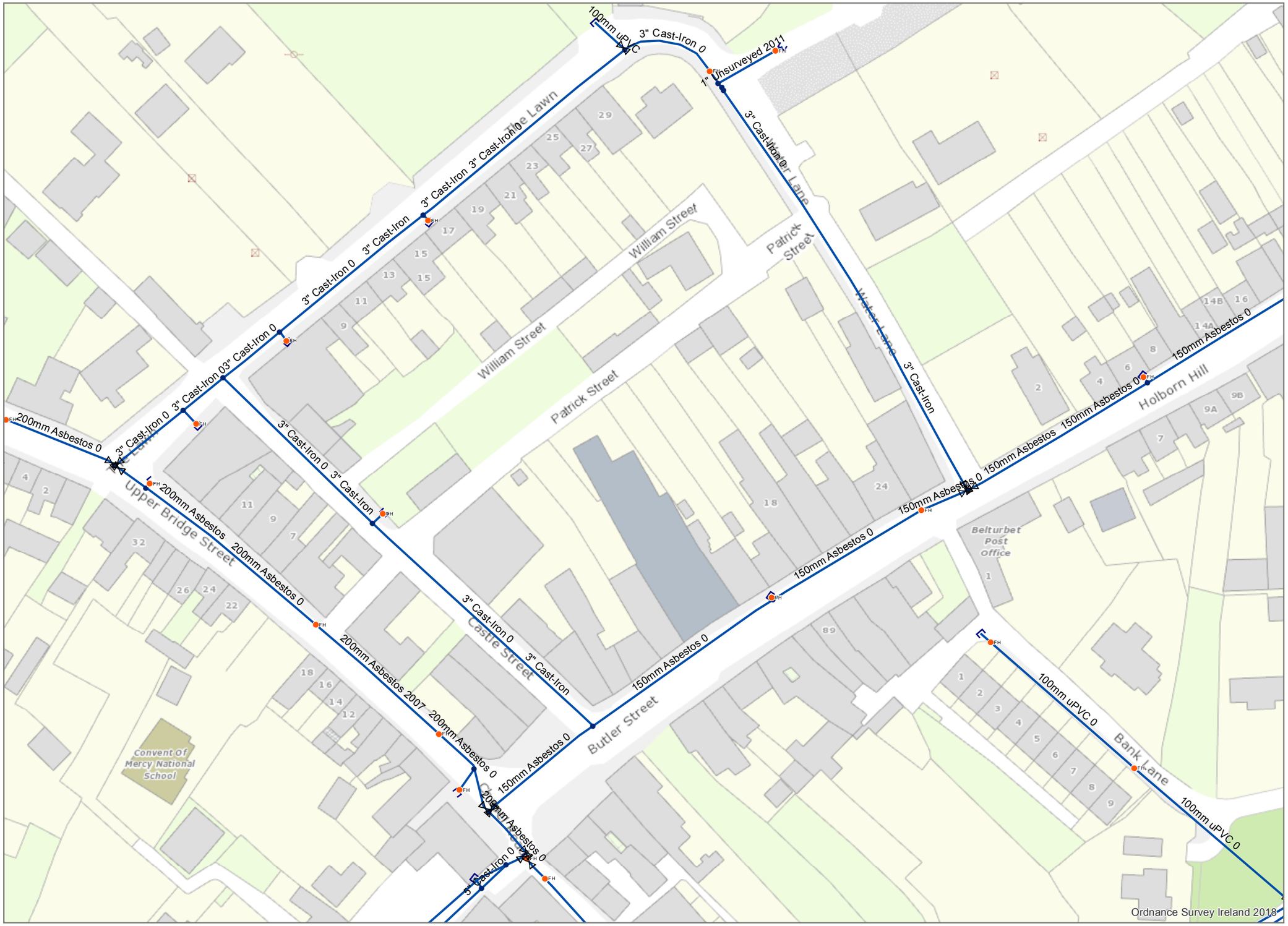
- VC Vent/Col

0 5 10 20 m

**Coordinate System: TM65 Irish Grid**
**Projection: Transverse Mercator**

| | |
|---|---|
| **Scale @ A3:** | **1:1,000** |
| **Drawing No.:** | **IW-AGG-2018-000** |
| | |
| **Drawn By:** | **RI** |
| **Checked By:** | **<Add Name>** |
| **Approved By:** | **<Add Name>** |
| | |
| **Drawn Date** | **24/01/2024** |
| **Checked Date:** | **<dd/mm/yyyy>** |
| **Approved Date:** | **<dd/mm/yyyy>** |

DRAFT






# Water Network

Uisce Éireann
Irish Water

## Legend

**Non Boundary Valves**
- Open

**Water Hydrants**
- Fire Hydrant

**Water Fittings**
- Cap
- Other Fitting

**Water Mains(Irish Water Owned)**
- Potable Water

0 5 10 20 m

| | |
|---|---|
| Coordinate System: TM65 Irish Grid Projection: Transverse Mercator | |
| Scale @ A3: | 1:1,000 |
| Drawing No.: | IW-AGG-2018-000 |
| | |
| Drawn By: | RI |
| Checked By: | <Add Name> |
| Approved By: | <Add Name> |
| | |
| Drawn Date | 24/01/2024 |
| Checked Date: | <dd/mm/yyyy> |
| Approved Date: | <dd/mm/yyyy> |

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