

**GOVERNMENT OF JERSEY
INFRASTRUCTURE AND ENVIRONMENT
OPERATIONS AND TRANSPORT
LIQUID WASTE**



**LIQUID WASTE DRAINAGE REQUIREMENTS FOR
DEVELOPMENTS**

dfidrainage@gov.je

01534 445509

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Revision Record

Version	Date	Details
1.0	16/06/2022	First Issue

0.0 Purpose

This document sets out the technical requirements that Infrastructure and Environment (Liquid Waste) (I&E(LW)) require from proposed developments to assess the potential impact of foul sewage and surface water emanating from the proposed development on public foul and surface water sewerage infrastructure, watercourses and the foreshore^{1 2 3}.

It contains details of information that will be required to facilitate the assessment, design requirements, guidance and reference to associated documents and standards related to the management foul sewage and surface water.

Infrastructure and Environment

Background

The Island's public sewerage system has been developed and extended since the 1840's, with the first sewage treatment works completed in the 1950s, and a new sewage treatment works due for completion in 2023.

The gravity foul sewer network has been extended to meet the drainage needs of growing population centres and new built-up areas, with a series of over 100 satellite pumping stations and inter-connected gravity systems conveying approximately 91% of the Island's foul sewage to the sewage treatment works. The localised satellite systems were designed to meet the relevant current populations at the time of their construction, with a limited allowance for population increases.

Generally, the foul sewerage system is either approaching or is near to capacity. Accordingly, I&E LW now require additional information to support development applications, as well as other requirements, in order to adequately advise and inform the planning process, and to meet the requirements of the bridging Island Plan.

Policy context

This "Drainage Requirements for Developments" contributes to the delivery of the objectives of the Waste Water Strategy⁴ and has been developed in accordance with and to meet the requirements of the [Bridging Island Plan](#), principally policies:

- WER2 – Managing Flood Risk
- WER6 – Surface Water Drainage
- WER7 – Foul Sewerage

The Island Plan requires the disposal of domestic foul liquid waste from new development, wherever possible, to the main public sewerage system.

The disposal of surface waters from new development should be managed within site boundaries with disposal to the public surface water network or watercourses if on-site management options cannot be achieved.

It is an established principle that enhancing capacity of the sewerage system, when that is required as a consequence of new development, will be the responsibility of the applicant.

¹ The Liquid Waste Team of the Infrastructure and Environment Department (I&E LW), the "Drainage Authority", is required by Article 16 of the Planning and Building (Jersey) Law 2002, and Article 32 of the Drainage (Jersey) Law 2005, to assess the impact of proposed developments on the Island's Public Foul Sewerage and Surface Water Sewerage Networks.

² [Drainage \(Jersey\) Law 2005 \(jerseylaw.ie\)](#)

³ [Roads \(Drainage\) \(Jersey\) Law 1962 \(jerseylaw.ie\)](#)

⁴ [P.039-2014 Waste Water Strategy \[Council of Ministers\] \(gov.ie\)](#)

1.0 Foul Sewage

1.1 Public Foul Sewer Network Capacity

In order that potential increases in the discharge of foul sewage from new development into the public foul sewerage network can be assessed, and the risk to the network and environment minimised, I&E(LW) may require a detailed foul drainage impact assessment (DIA). The following types of development may require the preparation of DIA.

- **Residential developments**

Proposed residential developments that will result in any additional residential units that are proposed to be connected to the foul sewer network (either directly or indirectly) will require a DIA.

Information will be required detailing the proposed number and type of additional units in order that the increase in occupancy and foul sewage flow rate can be established and the assessment carried out.

- **Change of use**

Proposed changes of use that will result in additions to foul sewage flow, or changes to the foul sewage flow pattern (i.e. conversion from retail to residential, or hotel to residential) that are proposed to be connected to the foul sewer network (either directly or indirectly) will require a DIA.

Information will be required detailing the existing use and flow rate together with the proposed use and flow rate. Proposed developments that will result in a demonstrated reduction in daily foul sewage flow will not require a DIA.

Establishing the requirement for and design data requirements of a DIA will require liaison between the developer and I&E LW to establish.

The DIA will be required to assess the impact of both the flow rate in litres per second (l/s) and daily flow volume (cubic metres) in order to assess the viability of the proposed development based on the maximum level of occupancy. Any assessment should be carried out using I&E Liquid Waste's current version of the InfoNet Jersey Drainage Area Plan (DAP) hydraulic model. Any costs associated with the preparation of a DIA and the modelling required will be borne by the developer.

1.2 Flows and Loads

For the identification and classification of property usage and the calculation of foul sewage loads, the Department refers to the current version of: "Code of Practice; Flows and Loads – 4; Sizing Criteria, Treatment Capacity for Sewage Treatment Systems"⁵ published by British Water.

Indices will be applied to allow for diurnal flow peaks; for residential properties, the diurnal indices will increase the daily flow rate (DWF) by a (maximum) multiple of 6 (6 x DWF).

1.2.1 Occupancy

The proposed occupancy of dwellings and other buildings (commercial, retail, manufacturing etc.) is required in order that the impact on the public foul sewer network can be assessed.

In support of the data provided in the reference publication in 1.2, occupancy rates will be required. With regard to domestic dwellings, occupancy will be based on residential unit type, as follows:

⁵ [Code of Practice; Flows and Loads – 4; Sizing Criteria, Treatment Capacity for Sewage Treatment Systems](#) available from British Water.

Houses

Bedrooms	1	2	3	4	5+
Design Occupancy	1.5	2.0	3.0	3.5	4.0

Flats / Apartments

Bedrooms	1	2	3
Design Occupancy	1.5	2.5	3.0

With regard to larger scale developments, actual census data averages will be applied:

Houses

Bedrooms	1
All developments	1.5
Bedrooms	2
All developments	2.0 per unit

Bedrooms	3
Up to 33 Units	3.0 per unit
Between 33 and 37 Units	Total Occupancy of 100
37+ Units	2.7 per unit

Bedrooms	4
Up to 29 Units	3.5 per unit
Between 29 and 33 Units	Total Occupancy of 100
33+ Units	3.0 per unit

Bedrooms	5+
Up to 25 Units	4.0 per unit
Between 25 and 29 Units	Total Occupancy of 100
29+ Units	3.5 per unit

Flats / Apartments

Bedrooms	1
Up to 67 Units	1.5 per unit
Between 67 and 71 Units	Total Occupancy of 100
71+ Units	1.4 per unit

Bedrooms	2
Up to 50 Units	2.0 per unit
Between 50 and 48 Units	Total Occupancy of 100
48+ Units	2.1 per unit

Bedrooms	3
Up to 33 Units	3.0 per unit
Between 33 and 36 Units	Total Occupancy of 100
36+ Units	2.8 per unit

1.3 Proposed Private Foul Sewage Pumping Stations

If the connection of existing or proposed developments to the public sewer network (either directly or indirectly) is to be effected by the use of a privately operated and maintained pumped system, in addition to the detailed information required in 1.1 and / or 1.2 above, the following information is required:

- i) Cover level (mAOD), plan area (m²) and depth (m) of the pumping station wet well / working sump
- ii) Overflow sump / additional storage volume (m³) and equivalent hours of storage (emergency)
- iii) On and Off Levels (mAOD)
- iv) Maximum Flow Rate (l/s)
- v) Plan location (mE, mN)
- vi) Spill location (mE, mN) and cover level (mAOD) of spill chamber
- vii) Length (m) and internal diameter (mm) of rising main
- viii) Proposals for Operation and Maintenance Procedures
- ix) A minimum self-cleansing velocity of 1.5 m/s is required

It should be noted that the pipework leading from the private pumping station to the public sewer will remain in private ownership and will not be taken into public ownership or administration.

1.4 Site Testing of Foul Sewage Apparatus

I&E (Liquid Waste) require evidence that all private foul drains, sewers, chambers and ancillary apparatus has passed the requisite watertightness testing prior to connection (either direct or indirect connection) to the public sewer or public sewer apparatus. Information relating to testing of gravity and pumped sewer apparatus can be found in "I&E General Civil Specification for Liquid Waste Projects".

1.5 Private Foul Sewage Attenuation Systems

On-site flow attenuation may be required to manage the impact on the downstream public sewer network. Such systems are known to experience issues including unpleasant smells, septicity, biochemical corrosion, and intense operation and maintenance requirements. Detailed operation and maintenance manuals will be required for the users of the private system.

1.6 Private foul sewage treatment systems

Private foul sewage treatment systems are not administered or regulated by the drainage authority. I&E (LW) may comment on the required vehicle access leading to such facilities, and the parking arrangements, so that visiting tanker vehicles are adequately accommodated. There is a general requirement that such facilities can be serviced wholly within the property and not on public highways.

2.0 Surface Water Management

Surface water emanating from developments should be managed on site by means of sustainable drainage systems (SuDs) such as soakaways. This also reflects the prioritised policy requirements within the Island Plan.

If it can be demonstrated that SuDs systems are not viable, I&E (LW) may accept disposal of surface water via watercourse or the public surface water network.

In order that the risks associated with the proposed increases in surface water (rainfall) emanating from proposed developments, and the potential impacts to:

- the public sewer network
- the environment
- adjacent and downstream watercourses
- adjacent and downstream land
- adjacent and downstream property

can be assessed, the Department may require a detailed surface water flood impact assessment (FIA) of proposed developments where surface water cannot be managed and disposed of within the site.

To assess the implications for surface water run-off and management associated with new development, the following factors will be required to be taken into account, and information provided to evidence this:

2.1 Rainfall

2.1.1 Design Rainfall, Climate Change and Rainfall Zones

Rainfall patterns are expected to alter due to the effects of climate change. In accordance with recognised best practice and in line with the Island Plan, there will be a more stringent analysis of proposed developments with regard to the management of rainfall. Rainfall climate change allowances identified in the Environment Agency's⁶ Flood Risk Assessments: Climate Change Allowances will be applied.

Recent (2022) stochastic rainfall figures and storm intensity graphs for design purposes have been developed for the calculation of surface water flows; developments that are proposing the discharge of surface water to the public surface water network or any watercourse will be required to apply the current version of the Jersey Design Rainfall data in calculations for surface water. Proposed positive drainage and attenuation systems that are intended to connect to the public surface water system, or any watercourse will require hydraulic modelling to determine the resultant flow conditions in the downstream sewer or watercourse.

Allowance will also be required to include for surface water from adjacent undrained green field areas that will naturally drain on to the site concerned. The modelling will include factors to allow for climate change over the next 100 years and urban creep.

It should be assumed that shorter duration events are more applicable to positive drainage systems, and longer duration events more applicable to attenuation systems.

⁶ [UK Environment Agency](#)

2.1.2 Climate Change

An increase of an additional 30% is required to be included on the rainfall figures to allow for the perceived effects of climate change over the next 100 years.

2.1.3 Urban Creep

An increase of an additional 10% is required to be included on the rainfall figures to allow for the perceived effects of urban creep over the next 100 years.

2.1.4 Overland greenfield allowance

Proposed developments should consider, where appropriate, the effects of greenfield run-off from either adjacent upstream areas, or soft landscaped areas within the development.

An allowance of 2.0 litres per second per hectare (2.0 l/s/ha) should be applied unless a lower run-off value can be demonstrated.

2.2 Positive Drainage

Proposed positive drainage systems (direct piped discharge to public surface water sewer or watercourse) are required to apply design rainfall events for a 1:30 year return period. The design duration of the event shall be for the worst-case duration, i.e. that which results in the highest flow rate (l/s).

Factors shall be added to the design rainfall to include for:

30% for climate change and

10% for urban creep (if applicable)

Calculations for positive drainage should apply the peak rainfall rate for the relevant rainfall duration.

2.3 Private Surface Water Attenuation Systems

Proposed Surface Water Attenuation Systems (Holding Tanks) that are intended to be connected either directly or indirectly into any watercourse, the foreshore, or public surface water systems are required to apply design rainfall events for a 1:100 year return period. The design duration of the event shall be for the worst-case duration, i.e. that which result in the highest nett attenuation volume (l, or m³) that incorporates the permitted discharge rate (l/s, or m³/s).

Factors shall be added to the design rainfall to include for:

30% for climate change and

10% for urban creep (if applicable)

The calculations should demonstrate that the proposed attenuation system is half-empty within twenty four hours after a 1:10 year return period event, of same worst-case duration identified in the design of the system.

Calculations shall be provided to demonstrate that the worst-case storm duration has been applied.

2.4 Private Surface Water Soakaways

Developments that are proposing the disposal of surface water by means of on-site private surface water soakaways are administered by the I&E Regulation Team (Planning).⁷

2.5 Flood Risk Assessments

In accordance with Policy WER2 (Managing flood risk) of the Bridging Island Plan, flood risk assessments (FRA) will be required where new development is at risk of flooding where it is an area at low, medium or high risk of inland or coastal flooding.

Where a development site is identified as being at risk of flooding, even if it is only a low risk, it is necessary for the development proposal to acknowledge this risk and identify suitable mitigation so the impacts of flooding can be managed, enabling the development and its occupants to be more resilient to future flooding and climate change. A flood risk assessment (FRA) should be prepared for any development within identified flood risk areas in order to assess the level of risk, potential mitigation measures, and to ensure its acceptability. The level of detail required within the FRA should be proportionate to the level of risk and vulnerability category of the proposed development, taken in the context of the scale of the proposal.

More detailed information and guidance can be found in the Jersey Strategic Flood Risk Assessment, Appendix D of the Bridging Island Plan⁸.

If a FRA is required, the developer will be expected, to identify, *inter alia*, the following information that will be the minimum necessary for undertaking the assessment:

- i) Location plan
- ii) Description of the development
- iii) Detailed plans showing the nature of the development
- iv) Surface water and foul drainage plans for the development – including connection points and details of any SuDs features / storage facilities
- v) Proposed levels for the development site including finished floor levels
- vi) Details of any large excavations that will be required and / or any significant temporary works
- vii) Details of any flood resistance and resilience plans
- viii) The estimated 1 in 100 Year and 1 in 200 year flood depths on the development site

⁷ Building Control On-Site Surface Water management [Part 6: drainage, hygiene and hot water storage \(gov.je\)](#)

⁸ [Appendix D of the Bridging Island Plan](#)

3.0 Private Sewer Apparatus – Operation and Maintenance

Developments that propose the inclusion of flow control devices, pumping stations, attenuation systems or other apparatus will be required by the I&E Regulation (Planning) to provide operation and maintenance manuals for inclusion within the deeds or covenants of the property or properties related to the development.

4.0 Hydraulic Modelling

Where computer hydraulic modelling is required to determine drainage requirements and assess the viability of the proposed development, this modelling shall be carried out by using I&E (Liquid Waste)'s current version of the InfoNet Jersey Drainage Area Plan (DAP) hydraulic model.

The computer hydraulic modelling will assess the impact of both flow rate (l/s) and daily flow volume in order to assess the viability of the proposed development.

Any costs associated with the modelling will be met by the developer.

5.0 Relevant Drainage Documentation

Drainage (Jersey) Law 2005	Government of Jersey
Roads (Drainage) (Jersey) Law 1962	Government of Jersey
Jersey Design Rainfall Intensities	I&E Liquid Waste
I&E General Civil Specification for Liquid Waste Projects	I&E Liquid Waste
Inland Pluvial Climate Change Study & Surface Water Management Plan (under development)	I&E Liquid Waste
Code of Practice; Flows and Loads – 4; Sizing Criteria, Treatment Capacity for Sewage Treatment Systems	British Water
Flood Risk Assessments: Climate Change Allowances	Environment Agency
Bridging Island Plan	Government of Jersey
Minimising Waste and Environmental Risk	

6.0 Glossary

6.1 Abbreviations

mAOD	metres Above Ordnance Datum
mm	millimetres
m	metres
m ²	square metres
m ³	cubic metres (volume)
l/s	litres per second (flow volume rate)
m/s	metres per second (velocity)
l/h/d	litres per head per day
mE, mN	metres Easting, metres Northing to the Jersey GIS Grid
DWF	Dry Weather Flow – the average daily foul flow rate

6.2 Terms

Self-cleansing velocity	The minimum fluid velocity (in a pipe) that is required to ensure the self-cleansing of the pipe without the need for intervention cleansing
SuDS	Sustainable Urban Drainage Systems