DRAFT NEWBRIDGE SETTLEMENT PLAN 2025 – 2029

Surface Water Management Strategy

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Prepared by:

RPS

Prepared for:

Kildare County Council

Dublin | Cork | Galway | Sligo | Kilkenny
rpsgroup.com

RPS Group Limited, registered in Ireland No. 91911
RPS Consulting Engineers Limited, registered in Ireland No. 161581
RPS Engineering Services Limited, registered in Ireland No. 99795
The Registered office of each of the above companies is West Pier Business Campus, Dun Laoghaire, Co. Dublin, A96 N6T7

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ACRONYMS

Acronym	Meaning
CFRAM	Catchment Flood Risk Assessment Management
DAP	Drainage Area Plan
DTM	Digital Terrain Model
GIS	Geographical Information System
GSI	Geological Survey Ireland
KCC	Kildare County Council
LAP	Local Area Plan
NBMAs	Nature-Based Management Areas
NBS	Nature-Based Solutions
OPW	Office of Public Works
SAC	Special Area of Conservation
SAR	Synthetic Aperture Radar
SuDS	Sustainable Drainage Systems
SW	Surface Water
SWMS	Surface Water Management Strategy
UÉ	Uisce Éireann
ULVSS	Upper Liffey Valley Sewerage Scheme

1 INTRODUCTION

1.1 Background

RPS was commissioned by Kildare County Council (KCC) to complete a Surface Water Management Strategy (SWMS) for the town of Newbridge, County Kildare.

The role and purpose of the strategy is to comply and implement national, regional and county policies and guidance on nature-based drainage solutions in urban areas including, inter alia:

- **National Policy Objectives 77, 79 and 80** of the National Planning Framework (2025) relating to the integration and retrofitting of sustainable water management solutions.
- **Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas** – Best Practice Interim Guidance Document (Department of Housing, Local Government and Heritage 2022).
- **Regional Policy Objective 10.15** relating to provision at a local level of Sustainable Urban Drainage solutions.
- **Action B14 of the County Kildare Local Authority Climate Action Plan 2024-2029** which seeks to ensure all developments including car parks are designed in to support nature-based surface water drainage solutions.
- **Action N13 of the County Kildare Local Authority Climate Action Plan 2024-2029** relating to the development and implementation of Nature-Based Solutions (NBS) and the incorporation of Surface Water Management Plans for both council and private sector projects, and to prioritise sustainable drainage systems over conventional systems in line with national guidance parameters.

1.2 Objectives

The objectives of the Newbridge SWMS are:

- To find a municipal-level, multi-site nature-based solution(s) to surface water management for Newbridge
- To designate areas where surface water can be managed
- To identify opportunities to build-in extra surface water attenuation capacity
- To prioritise nature-based solutions where possible
- To consider the amenity potential for any solution of scale (open space / parkland / linear and riparian access)

1.3 Key Constraints and Opportunities

Some key constraints and opportunities that shall be considered during the SWMS are as following:

- Potential impacts on Pollardstown Fen Special Area of Conservation (SAC) should be considered through this process. It is located to the northwest of the settlement. Qualifying interests include petrifying springs.
- Potential impacts on Mouds Bog (SAC) should be considered through this process. It is located to the north of the settlement. Qualifying interests includes active raised bogs, degraded raised bogs still capable of natural regeneration and depressions on peat substrates of the Rhynchosporion.
- Habitats Mapping

1.4 Scope

The scope of the SWMS and this report includes:

1. Identification of surface water assets / GIS layers / combined systems – mapping of existing infrastructure
2. Identification of permitted developments and their surface water arrangements
3. Assessment of the surface water attenuation capacity of permitted developments and undeveloped zoned land within the town
4. To inform the preparation of a new Settlement Plan for Newbridge
5. Identification of areas and modes / types of surface water management

1.5 Study Area

Newbridge is in the south of County Kildare along the banks of the River Liffey. It is approximately 40 km southwest from Dublin City Centre and situated along the M7 Motorway. The Dublin-Cork railway line passes through the north and west of Newbridge. Mouds Bog and Pollardstown Fen are both designated Special Areas of Conservation (SACs) located within close proximity to north and northwest of the study area.

The study area is based on a combination of boundaries which incorporates the existing Newbridge Local Area Plan 2013-2019 plan boundary, the CSO defined Built-up Area 2022 boundary and lands at Littleconnell as shown in **Figure 1-1**.

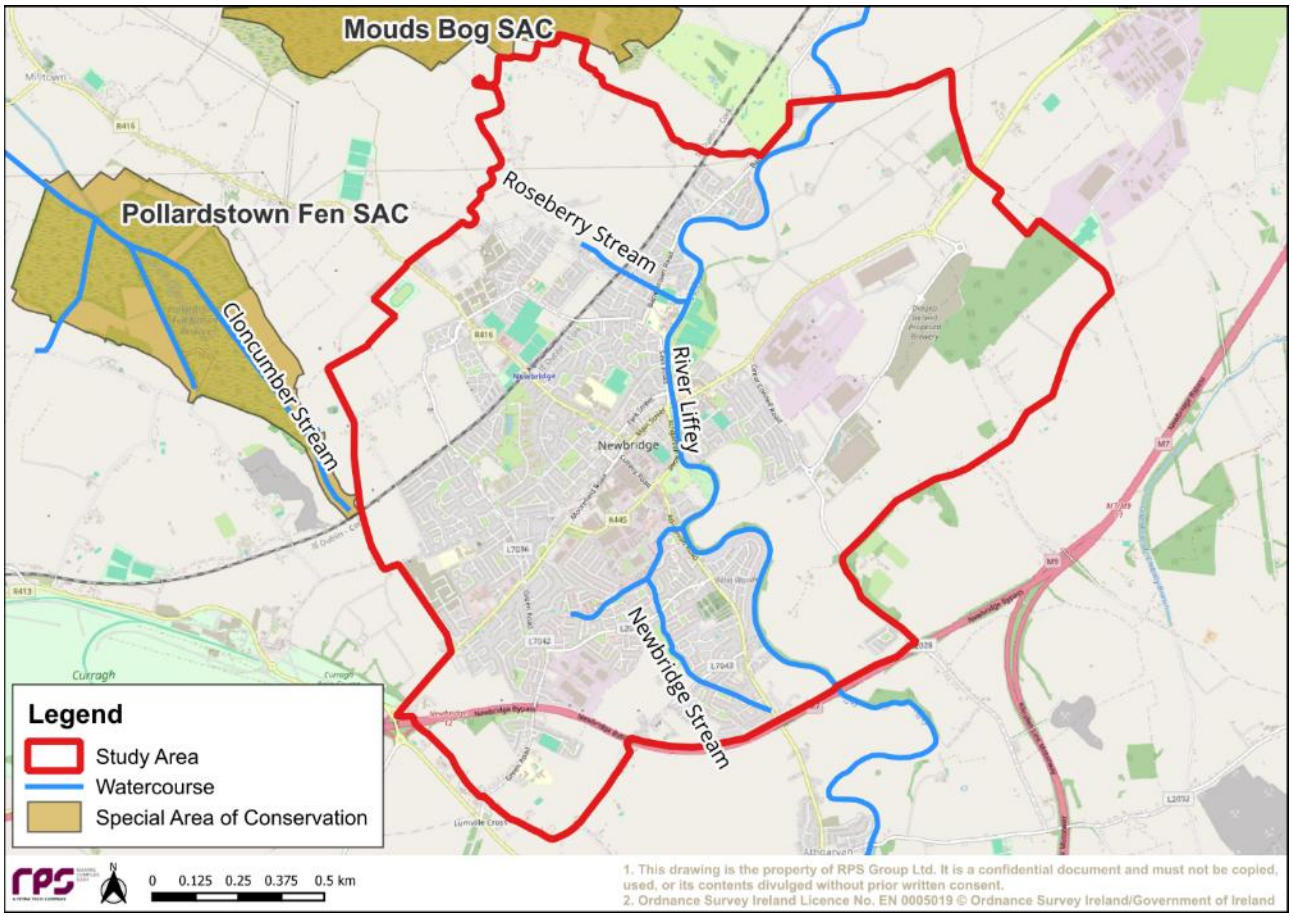


Figure 1-1: Newbridge SWMS Study Area

2 METHODOLOGY

2.1 Data Collection

Data and information were gathered to assist in defining the surface water drainage catchments. **Table 2-1** below shows the primary datasets and reports used in the study.

Table 2-1 Datasets and Reports Used to Help Define the Surface Water Drainage Catchments

Dataset	Ownership	Source
Watercourse Network	Environmental Protection Agency (EPA)	EPA Geoportal: https://gis.epa.ie/GetData/Download
Historic Flood Data	Office of Public Works (OPW)	Flood Maps Portal: Flood Maps - Floodinfo.ie
CFRAM flood mapping (Present Day and Climate Change Scenarios)	OPW	Flood Maps Portal: Flood Maps - Floodinfo.ie
2m DTM Raster of Study Area	Geological Survey Ireland (GSI)	Open Topographic Data Viewer: https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b7c4b0e763964070ad69bf8c1572c9f5
Surface Water Drainage Layouts from the KCC Planning Portal	KCC	KCC Planning and Strategic Development Department: http://webgeo.kildarecoco.ie/planningenquiry
Surface Water Drainage Network Shapefile	KCC	KCC Planning and Strategic Development Department
Uisce Éireann Foul Drainage Network Shapefile	Uisce Éireann	Uisce Éireann
Groundwater and Surface Water Flood Data	GSI	GSI: Geoportal Geological Survey Ireland Spatial Resources (arcgis.com)
Soil Hydrology Map	EPA	EPA Geoportal: https://gis.epa.ie/GetData/Download

2.2 Data Gap Analysis

The surface water drainage network shapefile received from KCC provided substantial but incomplete coverage of the surface water drainage network for Newbridge. Where coverage didn't exist in the KCC SW dataset, SW drainage drawings extracted from various planning applications via the KCC Online Planning Portal were compiled and digitised to produce a more complete SW drainage network in Newbridge. A desktop assessment in combination with a site visit and consultation with KCC helped to sensibility check the available datasets and infer the most logical path for the stormwater drainage network.

The foul drainage network shapefile received from Uisce Éireann provided coverage of a greater area than the KCC SW dataset. The UÉ dataset provides information on the foul network connected to the Upper Liffey Valley Sewerage Scheme. The dataset does not differentiate between combined sewer sections (foul water + surface water) of the network, and purely foul sections of the network. **Figure 2-1** provides a map of the available drainage datasets and the areas supplemented with drainage data from planning applications submitted to KCC. Whilst it is currently unknown, due to the absence of recognised SW drainage assets, it is assumed that there is at least one area of surface water contribution to the foul network.

It should be noted that Uisce Éireann is currently undertaking a Drainage Area Plan for Newbridge which is currently in its early stages. As the DAP develops, further opportunity for data sharing of drainage assets between KCC and Uisce Éireann should further improve drainage records and reduce uncertainty in existing datasets.

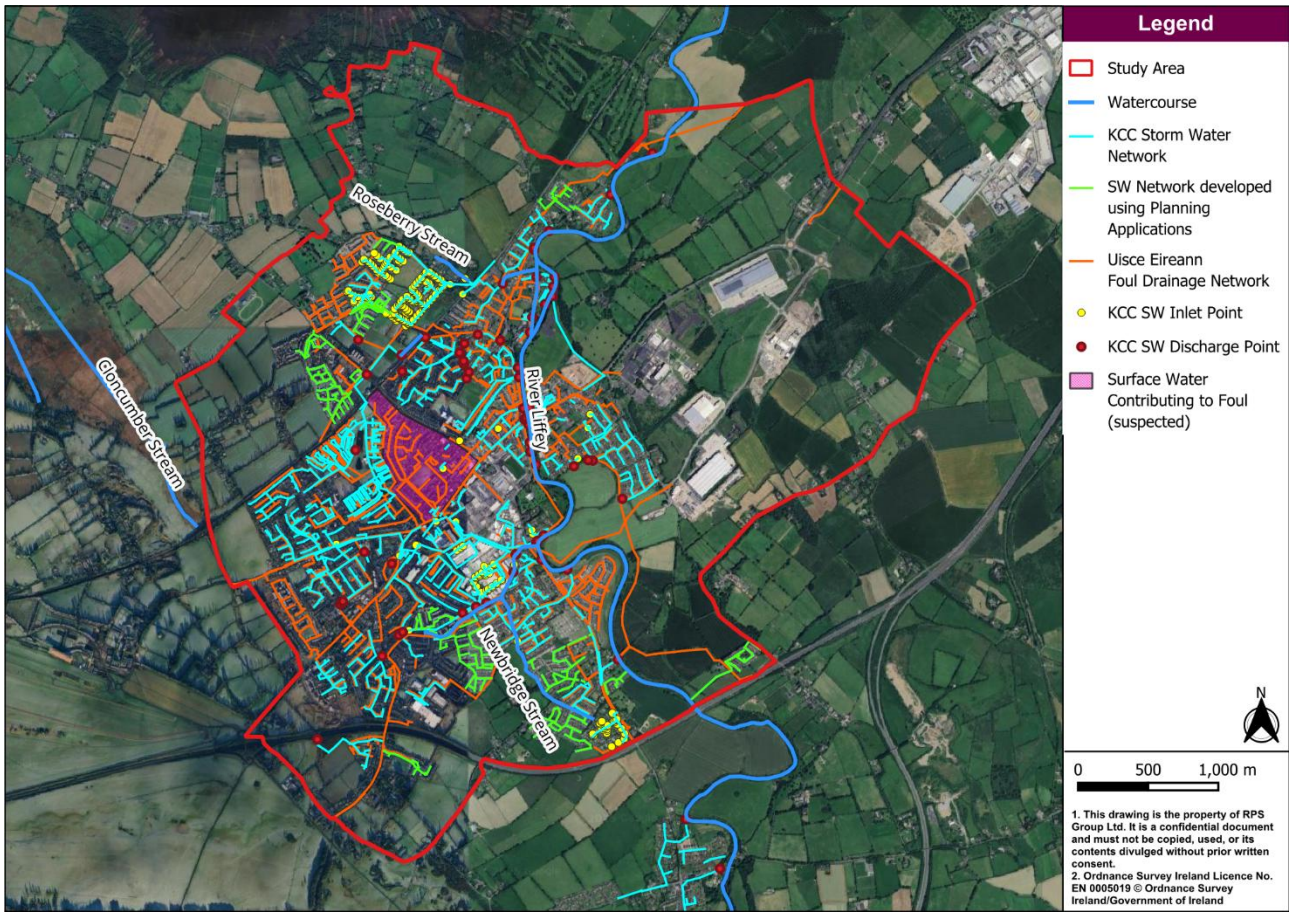


Figure 2-1: Surface Water Drainage Network Datasets

2.3 Conceptual Approach

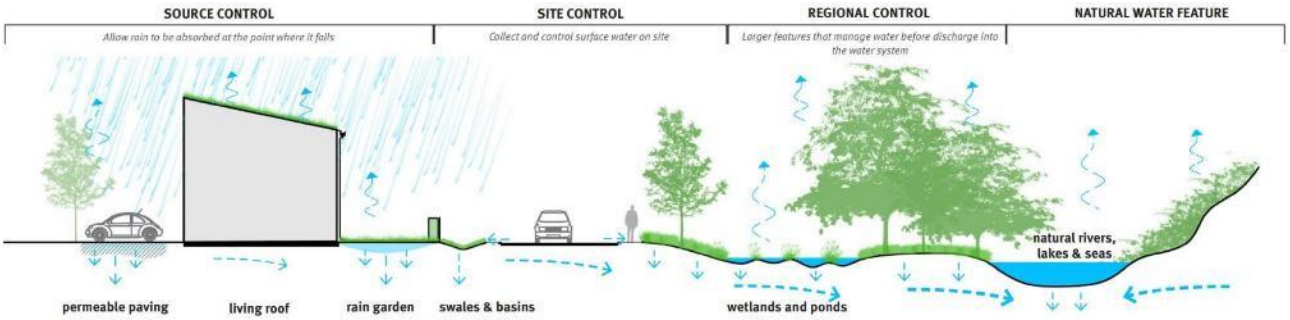
Surface water management in Newbridge should be in accordance with modern sustainable design practice, incorporating SuDS and water-sensitive urban design (WSUD) principles. The use of SuDS and nature-based solutions is required by the Kildare County Development Plan.

The following guidance also applies:

- Greater Dublin Strategic Drainage Study (DCC, 2005)
- The SuDS Manual C753 (CIRIA, 2015)
- Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas – Best Practice Interim Guidance Document (DoHLGH, 2022)
- Sustainable Drainage Systems Guidance Document (KCC, 2024)

To promote a holistic, catchment-wide approach to surface water management between neighbouring development sites, the concept of a SuDS 'management train' is used. This means surface water controls are implemented in a hierarchical fashion from the point at which rain lands (source control) up to the extent of a development site (site control) and eventually up to the wider sub catchment level (regional control).

A level of disposal is designed in at each stage of the management train and the surplus is conveyed to the next stage at an attenuated quantity and improved quality. This allows for connectivity of drainage systems between sites and the creation of green corridors providing habitat and amenity value. The concept is illustrated below in **Figure 2-2**.



Source: Sustainable Rainwater Management Guidance, CEC 2021

Figure 2-2: SuDS Management Train

Planning for specific areas dedicated to managing surface water at the sub catchment level is considered to be a practical and efficient approach. Newbridge has multiple watercourses running through it which serves as the final discharge points for the surface water.

Surface water from agricultural land should be managed by channelling it through open ditches, directing its flow towards designated watercourses. Similarly, in developed areas of Newbridge like the town centre and resident estates, it is essential to employ strategies such as rainwater harvesting to capture surface water at its source. The surface water collected by the SW drainage network should undergo attenuation processes before being discharged into watercourses. This not only helps in managing water quantity but also contributes to enhancing the quality of surface water intended for release into the river. This approach ensures the preservation of water quality in rivers, particularly important given the presence of the Pollardstown Fen SAC and Mouds Bog SAC in the vicinity of Newbridge.

- Pollardstown Fen (site code: 000396) is situated on the northern margin of the Curragh of Kildare, approximately 3 km northwest of Newbridge. It lies in a shallow depression, running in a north-west/south-east direction. About 40 springs provide a continuous supply of water to the fen. These rise chiefly at its margins, along distinct seepage areas of mineral ground above the fen level. The continual inflow of calcium-rich water from the Curragh, and from the limestone ground to the north, creates waterlogged conditions which lead to peat formation. There are layers of calcareous marl in this peat, reflecting inundation by calcium-rich water. This peat-marl deposit reaches some 6 metres at its deepest point and is underlain by clay. The site is an SAC selected for the following habitats and/or species listed on Annex I / II of the EU Habitats Directive: Cladium Fens, Petrifying Springs, Alkaline Fens, Geyer's Whorl Snail (Vertigo geyeri), Narrow-mouthed Whorl Snail (Vertigo angustior), and Desmoulin's Whorl Snail (Vertigo moulinsiana).
- Mouds Bog (site code 002331) is located about 3 km north-west of Newbridge, close to the Hill of Allen, and includes, inter alia, the townlands of Grangehiggin, Barretstown and Hawkfield. The site comprises a raised bog that includes both areas of high bog and cutover bog. Much of the margins of the site are bounded by trackways. The site is an SAC selected for the following habitats and/or species listed on Annex I / II of the EU Habitats Directive: Raised Bog (Active), Degraded Raised Bog, and Rhynchosporion Vegetation.

3 FLOODING

The Office of Public Works (OPW) Flood Hazard Mapping website (www.floodmaps.ie) was referred to determine whether there was any evidence of previous flooding within the study area.

3.1 Fluvial Flooding

The main source of flooding in the study area is fluvial. **Figure 3-1** presents the location of recurring flood events in Newbridge. Fluvial flooding within Newbridge occurs primarily from the Liffey River, Roseberry Stream, Great Connel Stream and Newbridge Stream. **Table 3-1** presents the description of previous flood events as illustrated on Figure 3-1.

Table 3-1 Historical Flooding in Newbridge

Flood ID	Flood Event	Description
ID-1491	Kilbelin, Newbridge	Area floods after heavy rain. The surface water system is not able to cope. Occurs 1 or 2 times per year.
ID-1494	Miltown Road, Newbridge	Tributary of the Liffey (Roseberry Stream) overflows its banks after heavy rain. Housing in Lakeside Park and Mount Carmel are affected. Developer has undertaken some remedial work.
ID-1495	Newbridge College, Newbridge	Flooding occurs at the junction of the Roseberry Stream and the River Liffey after heavy rain.
ID-1496	Hosbery	Stream entering Liffey overflows its banks after heavy rain.
ID-1503	Moorfield, Newbridge	Ballymanagh Cottages are liable to flood after significant heavy rain due to runoff from the Keadeen Hotel car park.
ID-1504	Naas Road, Newbridge	Road is liable to flood every year after heavy rain due to inadequate drainage.

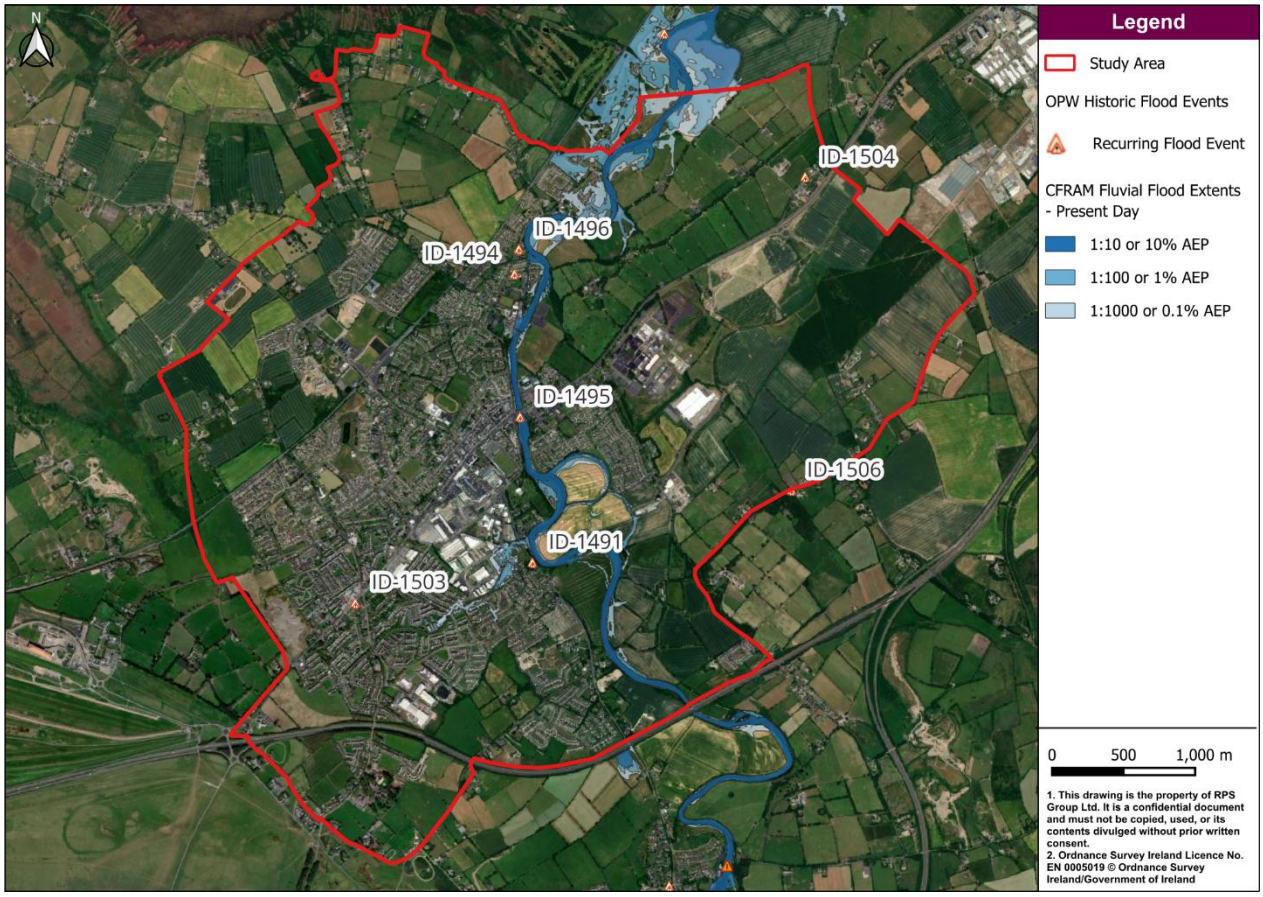


Figure 3-1: Fluvial Flood Risk

3.2 Groundwater Flooding

A review of the GSI Groundwater Flooding Data, as presented in **Figure 3-2,** shows no instances of groundwater flooding occurring within the Newbridge study area. There are also no predicted groundwater floods in the region. The risk of groundwater flooding for the study area is deemed to be low.

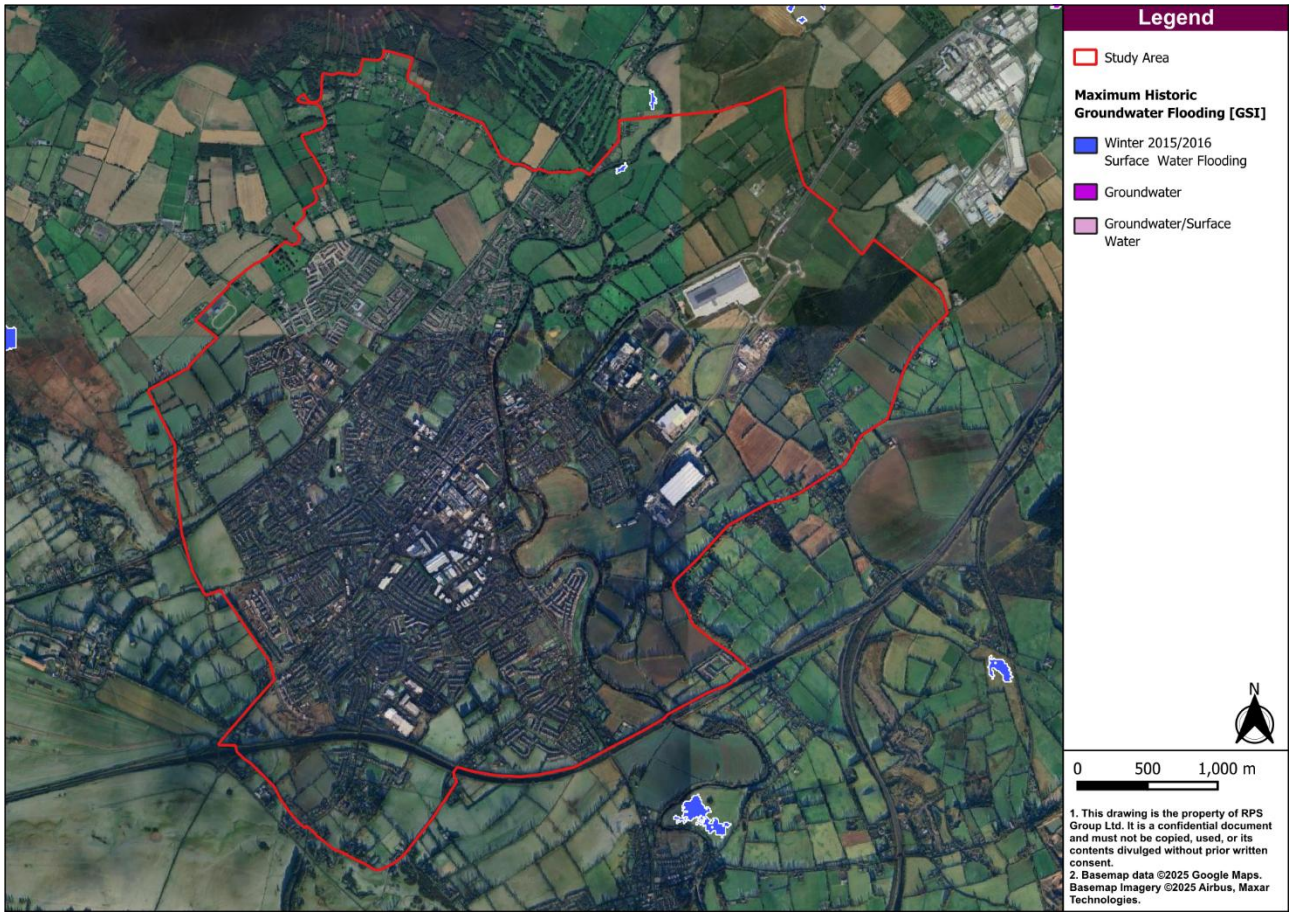


Figure 3-2: Historic Groundwater Flooding in Newbridge

3.3 Pluvial Flooding

The Geological Survey Ireland (GSI) winter 2015/2016 surface water flooding data confirms that there have been historic events of surface water flooding in the north of Newbridge, northeast of the Old Connell Weir Housing Estate, and it is represented in the **Figure 3-3**. Furthermore, the GSI Synthetic Aperture Radar (SAR) Seasonal Flood Maps shows the observed peak flood extents of groundwater and surface water for Newbridge between Autumn 2015 and Summer 2021. The flood extents are observed along the eastern bank of the River Liffey where it runs through Newbridge. The study area is prone to surface water flooding. This issue must be addressed while planning for a surface water management strategy.

Figure 3-3: GSI Winter 2015/2016 Surface Water Flooding and SAR Seasonal Flood Maps for Newbridge

4 NATURAL DRAINAGE

4.1 Overview

Natural drainage refers to the process by which surface water moves in an area depending on topography and geological features of the area. This section aims to provide information about soils hydrology, topography and receiving water bodies for the study area.

4.2 Topography

The topography of the study area is presented in the **Figure 4-1**. The present-day course of the River Liffey and its historical meandering channels dominate the topography through the centre of the study area. The study area generally slopes downwards to the north with higher elevation along the southern and western regions. The study area all naturally slopes towards the River Liffey with exception of the lands along the western boundary of the study area which slope to the west towards the Cloncumber Stream. The Dublin-Cork railway line and M7 Motorway are both raised linear infrastructure crossing the study area altering the natural surface drainage patterns. These will influence the catchment delineation and proposal of nature-based solutions (NBS).

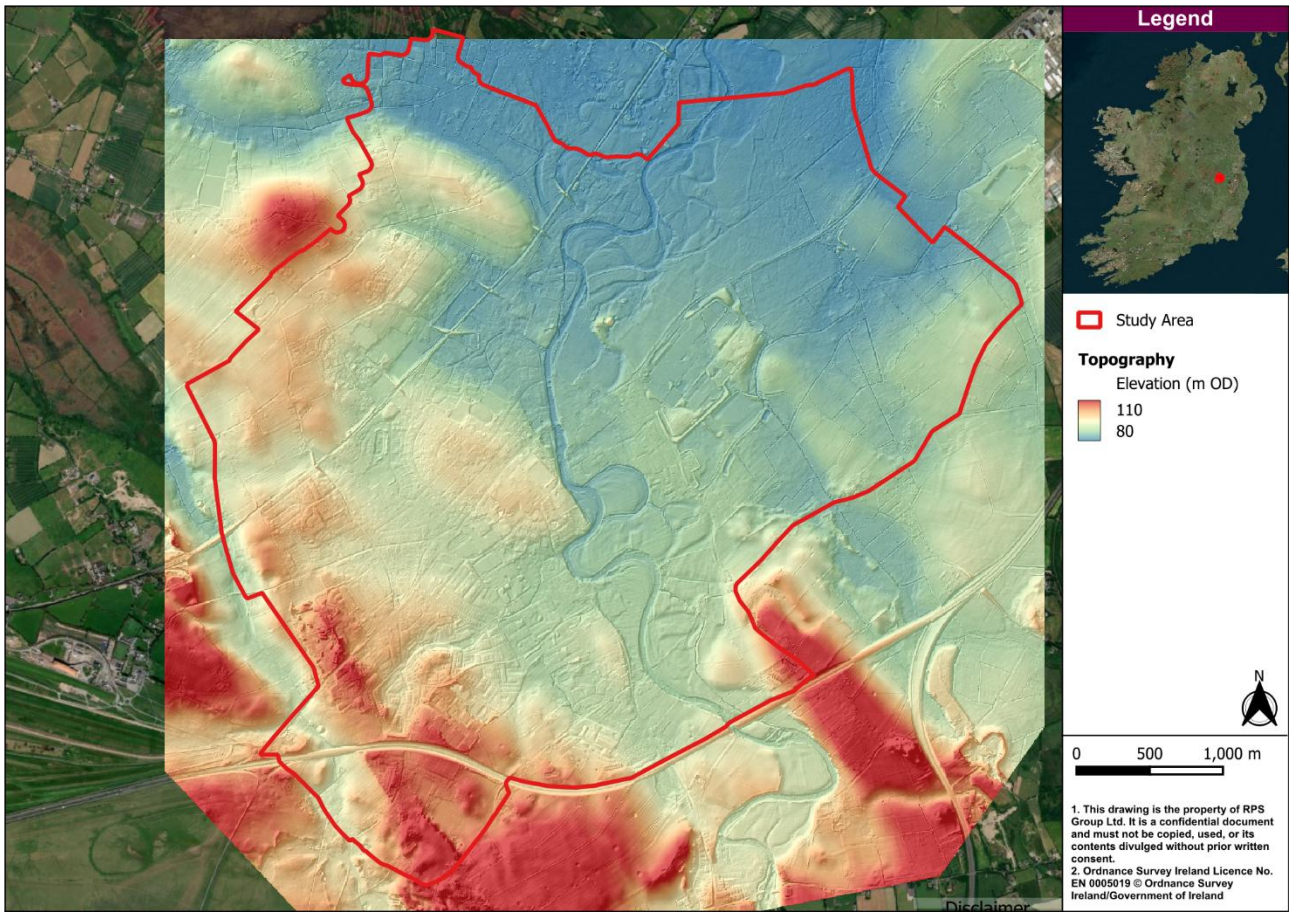


Figure 4-1: Study Area Topography

4.3 Soil Hydrology

The existing urbanised land within the study area is largely underlain by made ground material[1]. Alluvial material lines the watercourse floodplains, particularly along the River Liffey. Most undeveloped regions contain well-drained material with pockets of poorly drained material as shown in **Figure 4-2**. Peat is identified in the very northern portion of the study area. The groundwater vulnerability through the study area ranges from moderate to high.

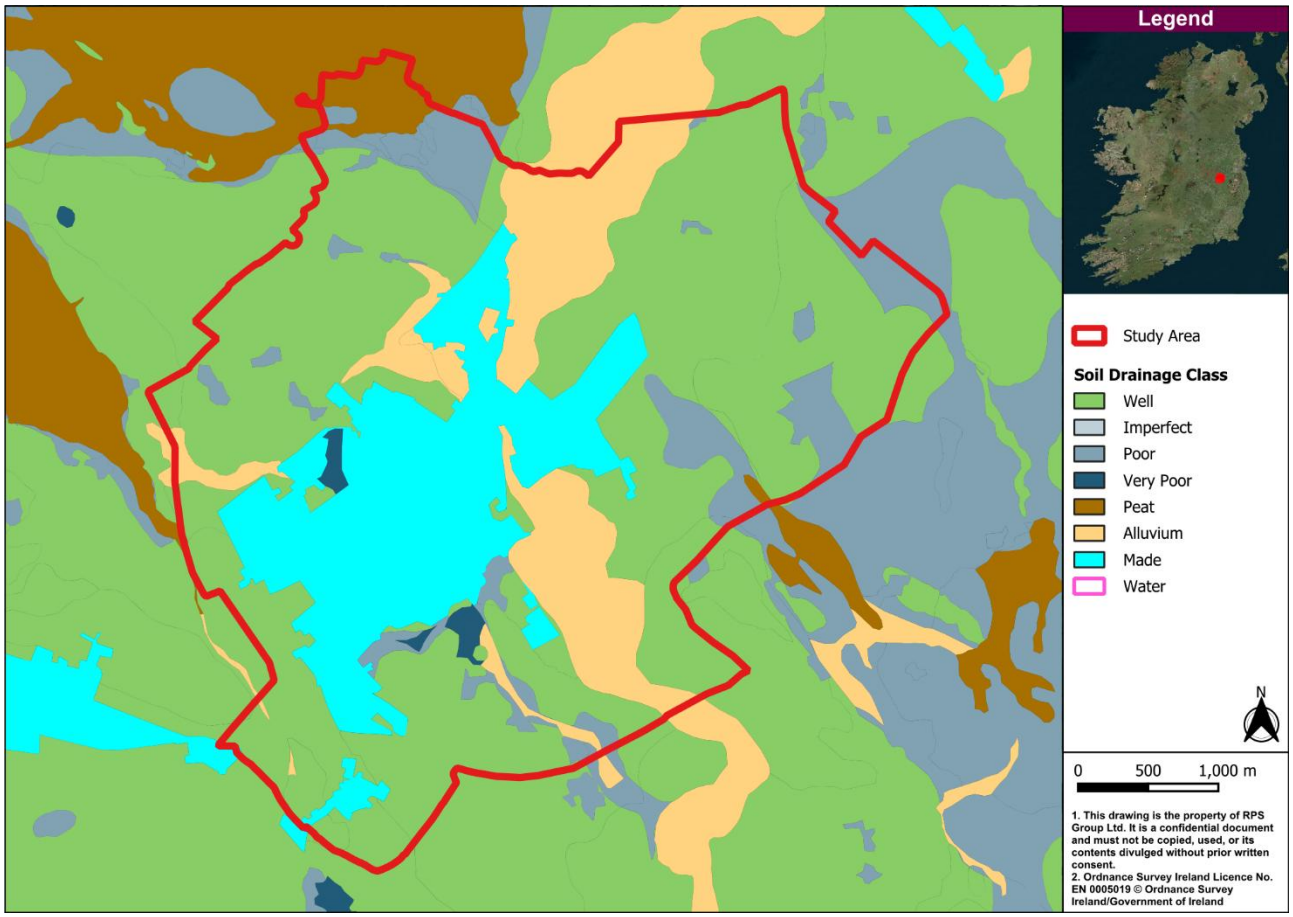


Figure 4-2: Soils Hydrology in the Study Area

[1] Made Ground is soil or other material that has been excavated and relocated, or artificially created through construction activities, to modify the existing ground conditions.

4.4 Receiving Surface Water Bodies

The River Liffey passes through the centre of the study area. A few smaller streams, namely, Roseberry Stream and Newbridge Steam are tributaries of the River Liffey which flow through urbanised areas of Newbridge (as shown in **Figure 4-3**). A small portion of the western side of the Study Area naturally drains surface water towards the Cloncumber Stream and Pollardstown Fen SAC. The eastern portion of the study area currently consisting predominantly of agricultural land, drains towards an un-named watercourse not identified with the EPA Watercourse Network. This watercourse flows in a northerly direction before joining the River Liffey downstream of the Study Area.

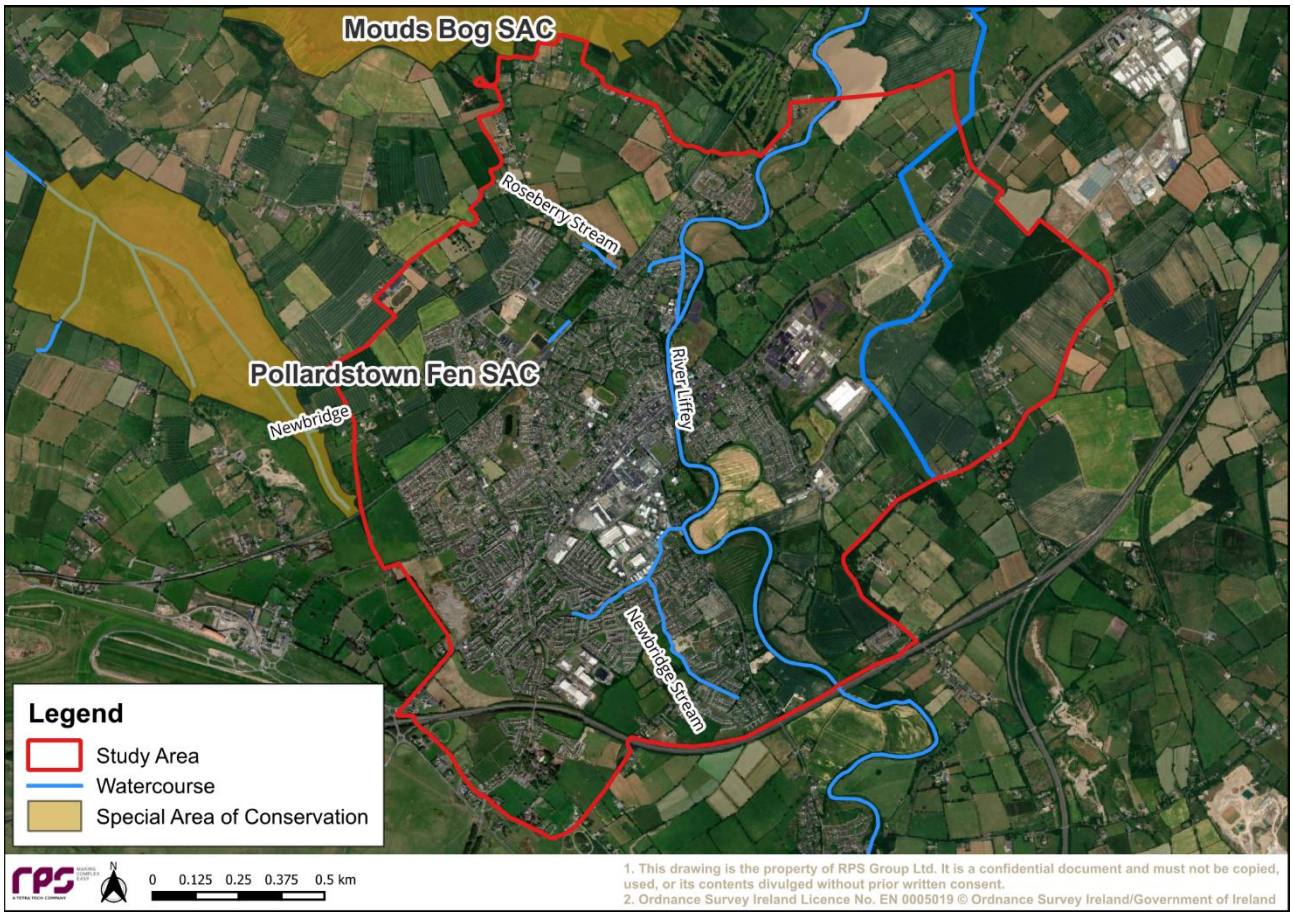


Figure 4-3: Watercourses Present in the Study Area

5 EXISTING DRAINAGE NETWORK

5.1 Surface Water Network

The surface water in Newbridge is predominantly collected by a separate surface water (SW) drainage network, though it is suspected that at least one older urbanised area has surface water contributing to a combined foul sewer as show in **Figure 5-1**.

The existing surface water drainage network in Newbridge discharges the surface water into the various watercourses, which ultimately flow to the River Liffey

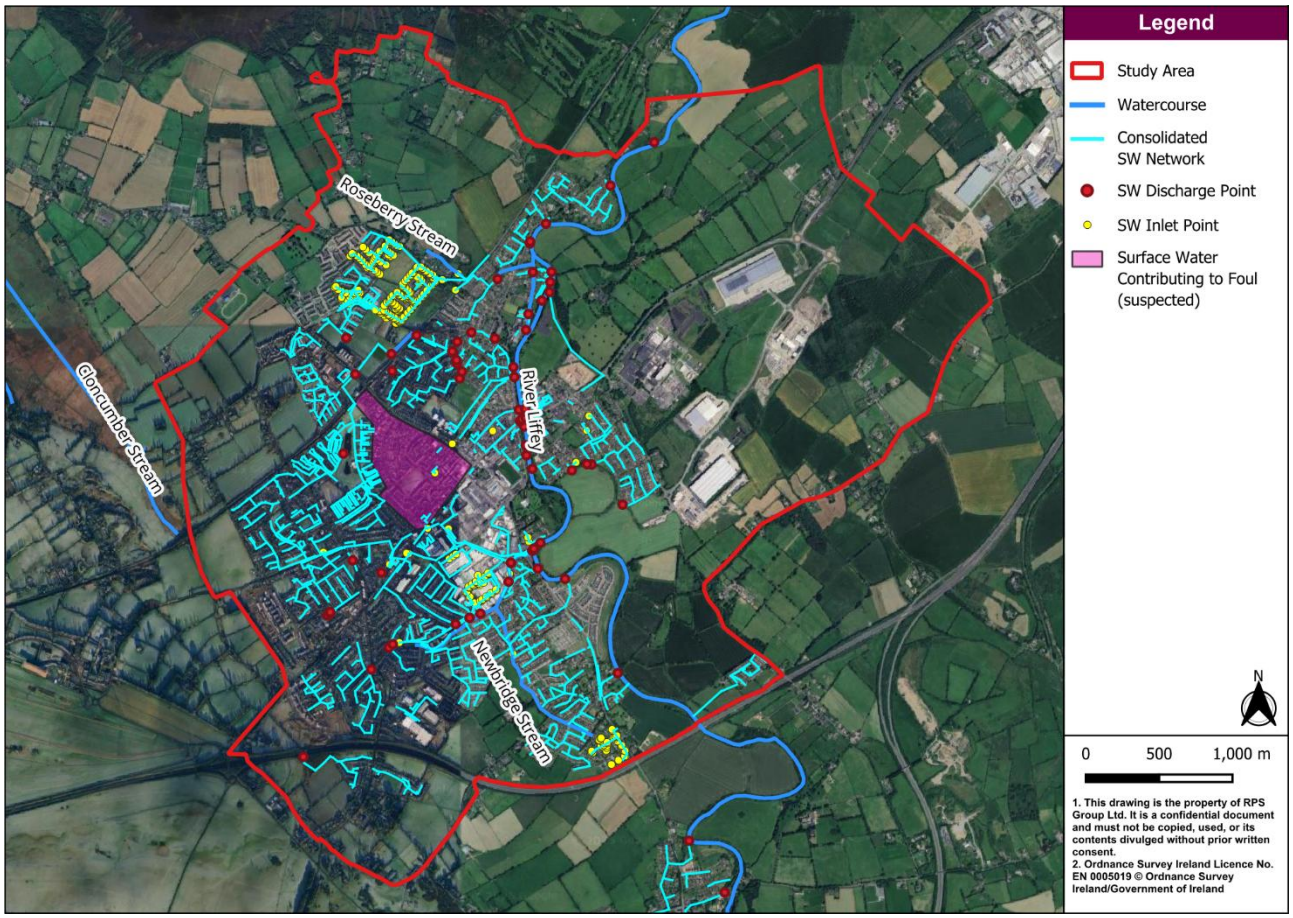


Figure 5-1: Newbridge Surface Water Drainage Network

5.2 Foul Drainage Network

The town of Newbridge has a separate foul water drainage network for the majority of the area. The network is shown in **Figure 5-2** is the Uisce Éireann foul and surface water gravity main. This network is understood to being been updated in keeping with the Upper Liffey Valley Sewerage Scheme (ULVSS). The datasets should be continuously revised in keeping with these updates.

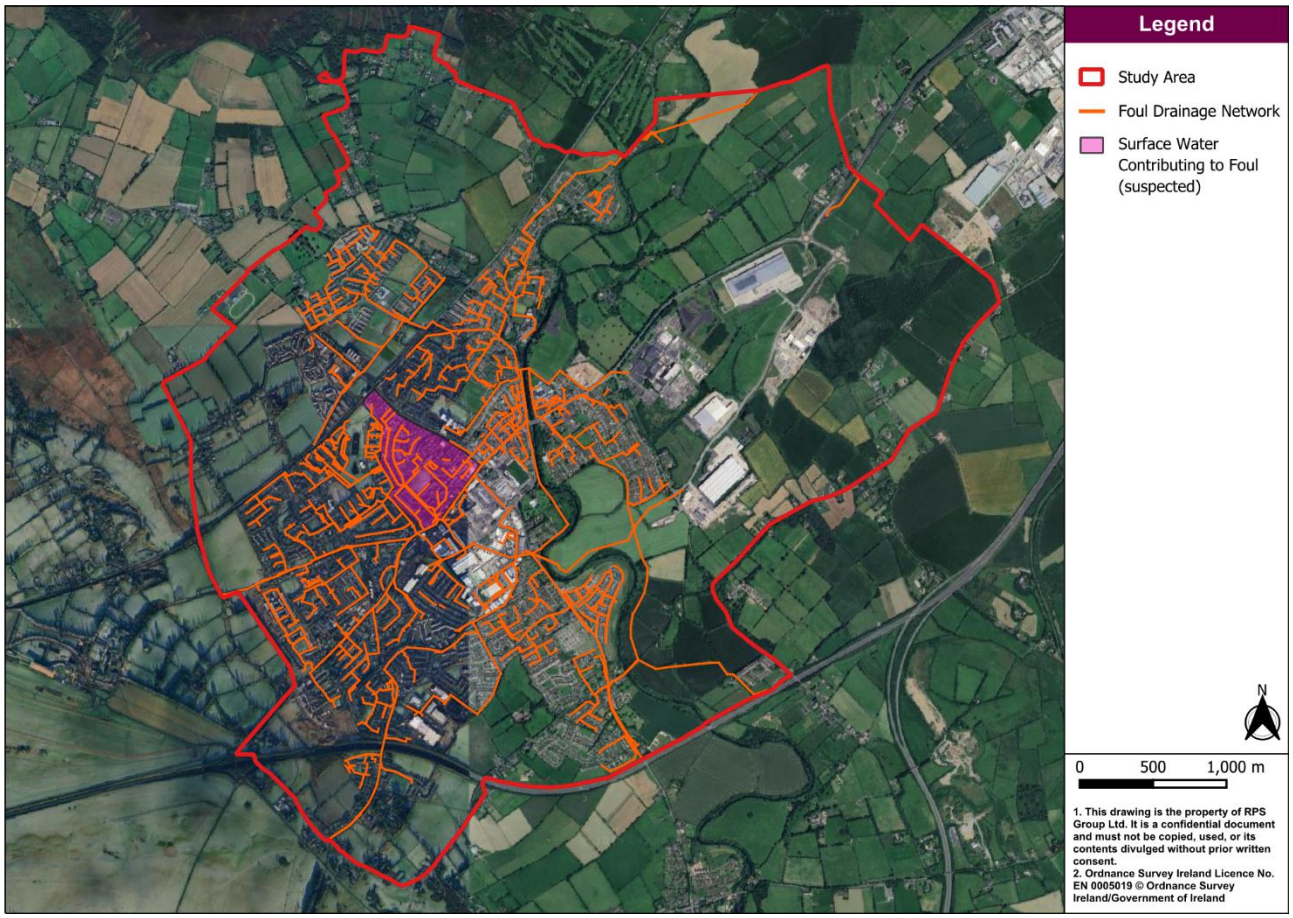


Figure 5-2: Newbridge Foul Water Drainage Network

5.3 Drainage Summary

Newbridge has multiple drainage networks, all of which discharge to the River Liffey and its tributaries.

The two largest drainage networks discharge into the River Liffey on Athgarvan Road, behind Kilbelin Crescent, and Barretstown Road, respectively. The Upper Liffey Valley Sewerage Scheme (ULVSS) network which serves a large portion of the town centre also discharges into the River Liffey on Athgarvan Road.

The existing surface water drainage system in Newbridge is as follows:

- Surface Water collected by surface water drainage network. The area is served by the ULVSS which discharges into the Liffey River
- Surface water drainage network present on Barretstown Road north of Newbridge College which discharges to the River Liffey
- Surface water drainage network present on the Athgarvan Road and within Newbridge Industrial Estate which discharges to the River Liffey
- Discharge to various watercourses present in Newbridge
- Discharge to the River Liffey at various watercourses locations in the Newbridge
- Discharge to groundwater via infiltration

6 SURFACE WATER MANAGEMENT PROPOSALS

6.1 Catchment Delineation Review

The study area comprises of the River Slate and River Liffey sub catchments. These catchments have been reviewed and updated using GIS analyses. The steps outlined below were followed to review and update the catchments:

1. The best available digital terrain model (DTM) of the study area was procured.
2. The catchment delineation was performed in the GIS software package QGIS manually using the DTM, terrain profile and aerial photography.
3. These catchments were reviewed against the prevailing surface water drainage network and constraints affecting the natural drainage of the study area such as the M7 Motorway and the Dublin-Cork railway line traversing the study area.
4. Following the review, corrections were made to the developed catchment.

Maps were produced for all developed catchments for the Newbridge SWMS (refer to Figure 6-1 for the overview of developed catchments) and measures suggested for the delineated catchments are described in further sections of this report.

For the purposes of assessing land uses within the study area reference is made to the land use zoning designations under the Newbridge Local Area Plan (LAP) 2013-2019 for specific sites if they are located inside the LAP boundary. This in no way should be seen as inferring a prior commitment to the nature of any future zoning of a particular site.

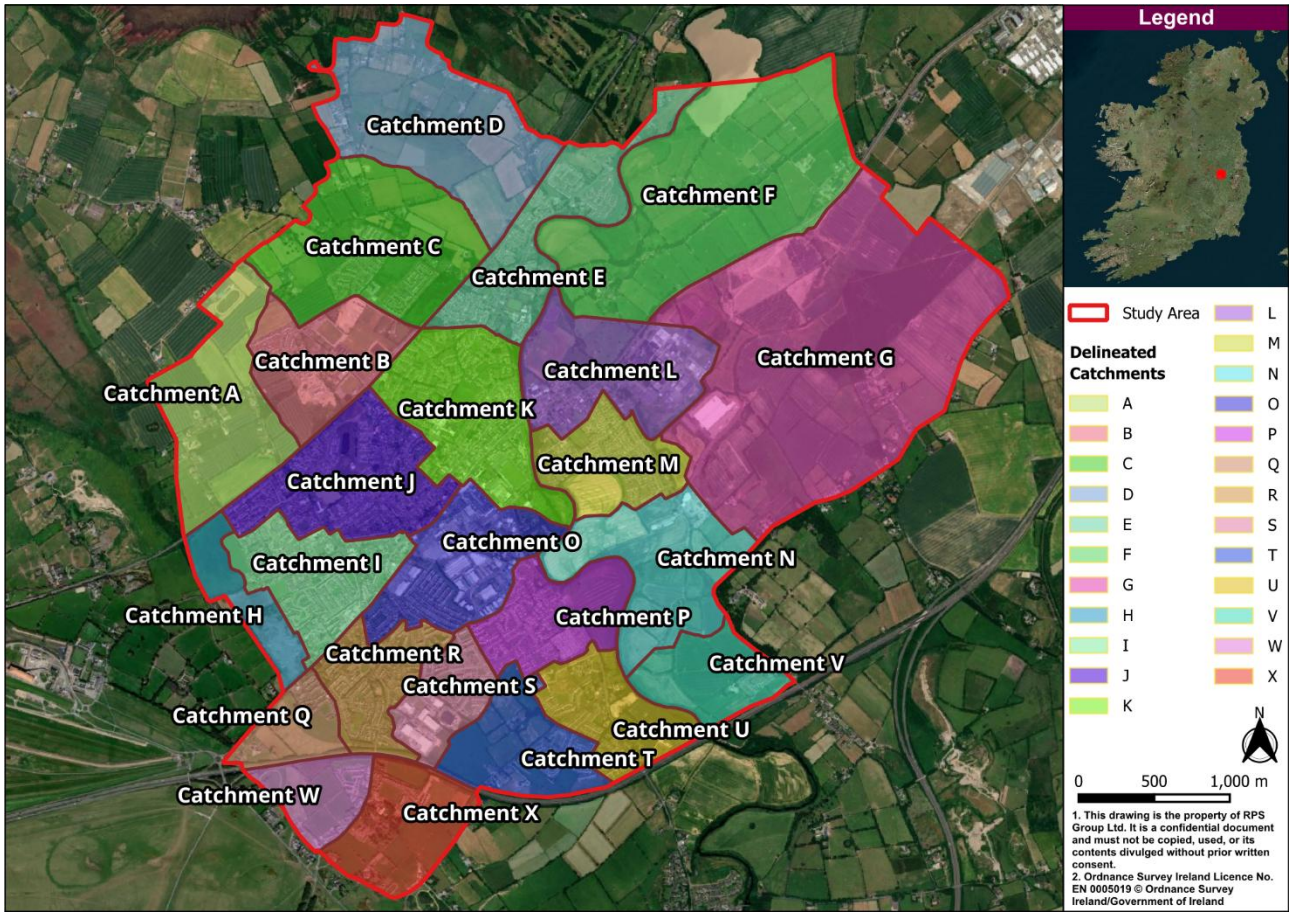


Figure 6-1: Overview of Newbridge Surface Water Catchment

6.2 Catchment A

Catchment A is in the westernmost surface water catchment within the Study Area. It is located north of the Dublin-Cork railway line. The catchment comprises both agricultural and residential lands which drain west to the Cloncumber Stream and the Pollardstown Fen Special Area of Conservation (SAC).

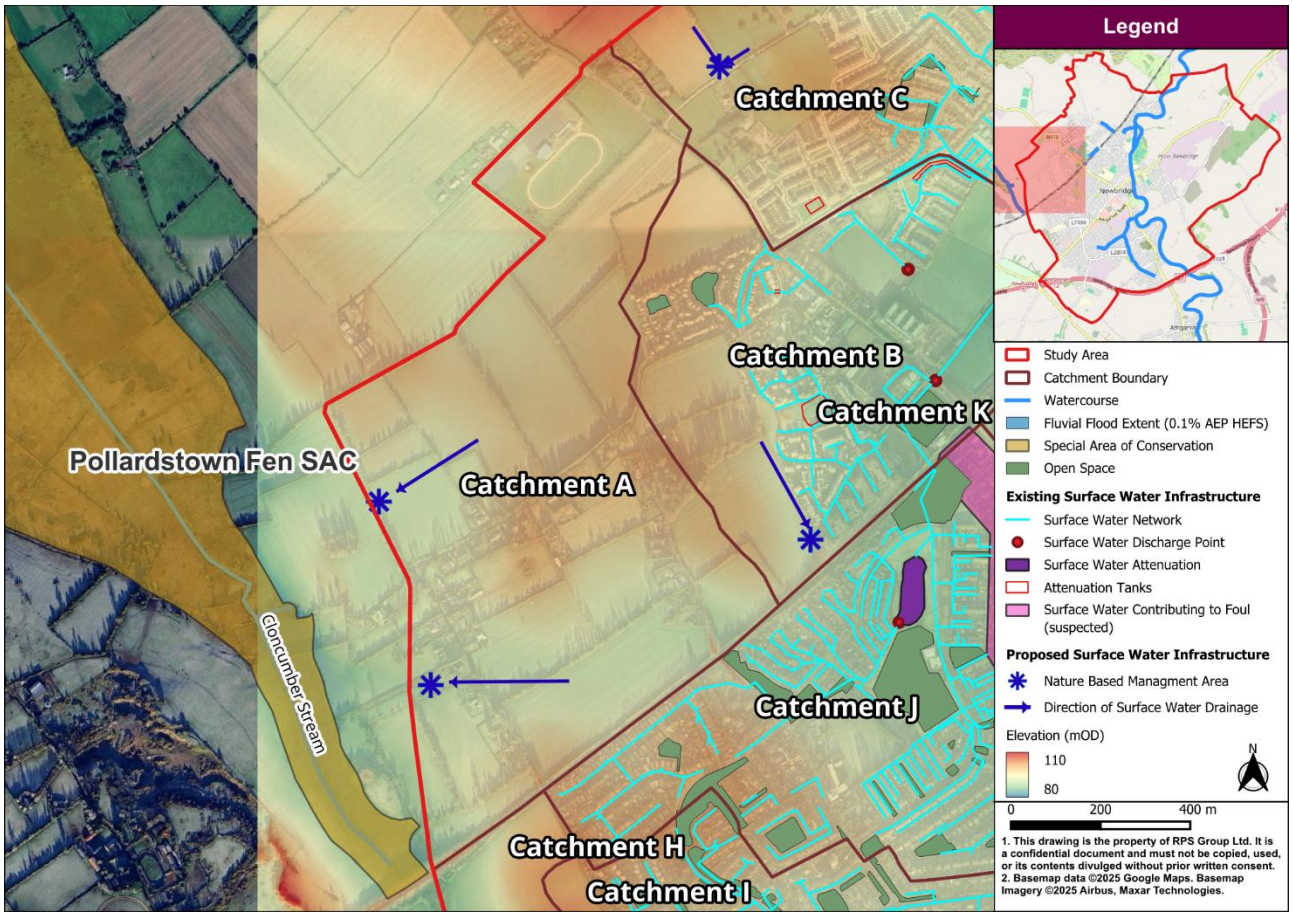


Figure 6-2: Catchment A Surface Water Management

6.2.1 Development Zoning

A portion of the land within Catchment A lies outside the Newbridge LAP 2013-2019 and is unzoned. The area within the LAP boundary is zoned as follows:

- I - Farmland

6.2.2 Proposed Drainage Strategy

- Catchment A is agricultural land located in the extreme west of the Newbridge study area. Surface water falling within Catchment A flows from north to south, towards the Dublin-Cork railway line. From here surface water flows either west towards Cloncumber Stream or east towards Newbridge's surface water (SW) drainage networks. Cloncumber Stream runs parallel to Catchment A on its west, outside the study area boundary. An increase in elevation on the eastern side of the catchment divides Catchment A from Catchment B.
- Two Nature Based Management Areas are proposed at low points on the western boundary of the catchment. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network into the Cloncumber Stream. This will help mitigate surface water flooding or pollution of the Pollardstown Fen SAC downstream of the Cloncumber Stream. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.3 Catchment B

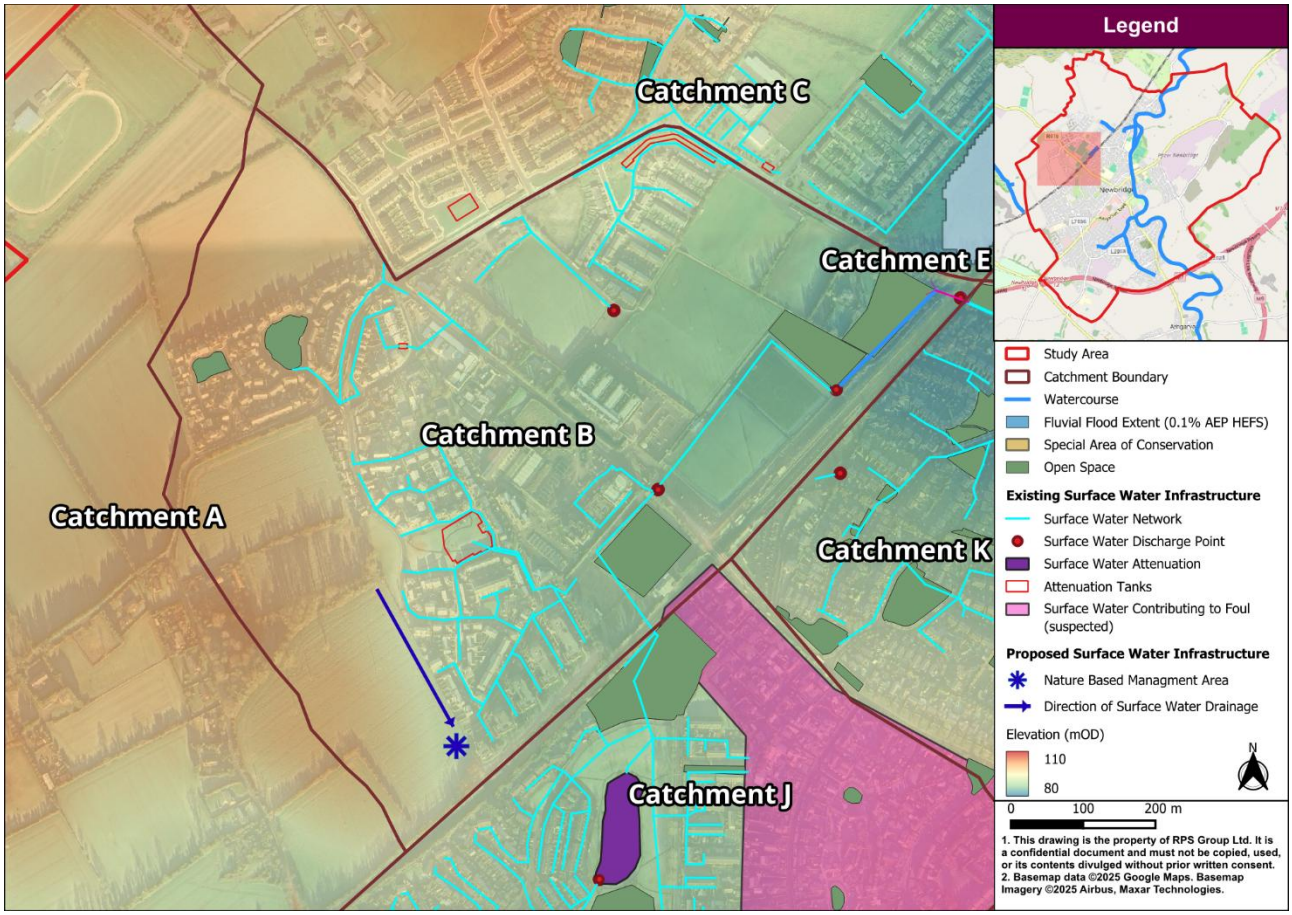


Figure 6-3: Catchment B Surface Water Management

6.3.1 Development Zoning

Catchment B consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – The Meadows
- C4 and C5 – Morristown Woods residential estate
- C6 – White Oaks
- D – Undeveloped greenfield site
- E – St Mark's Special School, The Gym Newbridge
- F – Newbridge Town FC, Sarsfield GAA, Newbridge Hotspurs, Commons
- I – Farmland
- J – Newbridge Train Station
- O – Department of Defence, Directorate of Military Intelligence

6.3.2 Proposed Drainage Strategy

- Catchment B consists largely of agricultural, residential, and open space lands. The White Oaks estate has a developed SW network.
- The Meadows estate drains to a SW network that flows southbound and appears to connect to the SW network for Morristown Woods development, which flows northeast through Newbridge Town FC grounds before draining to a culvert that flows northeast, parallel to the Dublin-Cork railway. Sarsfield GAA grounds have a smaller SW network that appears to drain southeast to join the network before it drains to the culvert. Potential pinch points along the railway line may lead to SW flooding. However, consistent maintenance of the SW network located there should mitigate potential flooding. Flooding observed is mostly nuisance flooding.[2]
- St Mark's Special School and Morristown Grove drain into a small SW network which terminates on Station Road but appears to drain down to join the SW network at the Newbridge Town FC grounds. All SW networks within the catchment appear to discharge to the culvert that drains parallel to the Dublin-Cork railway line.
- A Nature Base Management Area is proposed at a low point on the western portion of the catchment. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge into existing drainage network. The catchment is indicated to have well-draining soil; therefore, infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.
- Consideration should be given to utilise public open green space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

[2] Nuisance flooding, in this instance, refers to small scale, recurring flooding, often the result of seasonal weather or small blockages in surface water infrastructure.

6.4 Catchment C

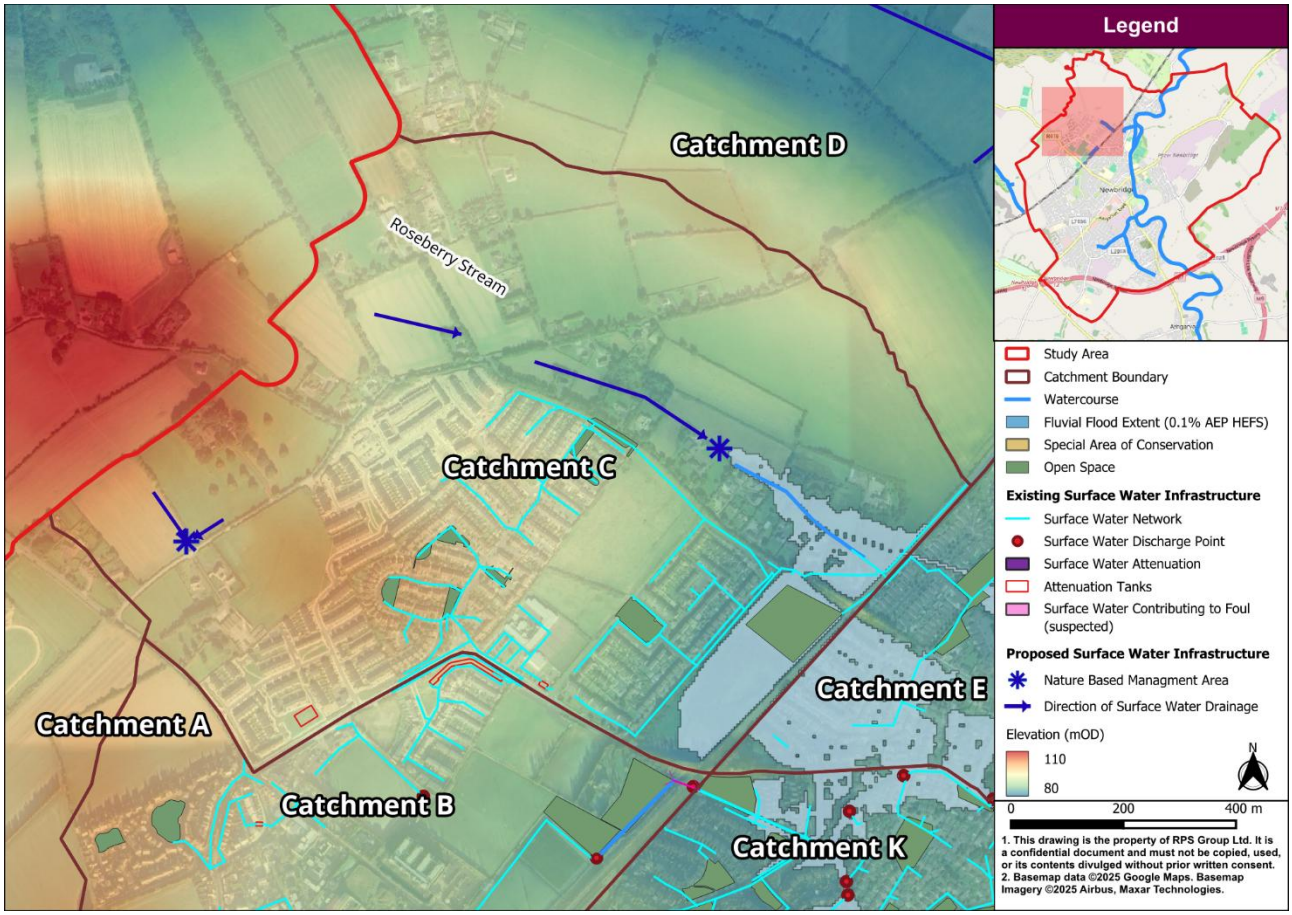


Figure 6-4: Catchment C Surface Water Management

6.4.1 Development Zoning

Catchment C is situated in the northwest of the study area and consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Roseberry Hill, Rosconnell Road
- C7, C8, C9 and C10 – Station Walk residential estate
- C11 – Greenfield site
- E – Scoil na Naoimh Uilig
- F – Greenfield site
- I – Farmland

The northernmost section of the catchment is unzoned with satellite mapping indicating that this land is agricultural in nature.

6.4.2 Proposed Drainage Strategy

- Catchment C is located within the northwest of the Newbridge study area. The catchment drains into two SW networks. The Station Walk residential estate has an attenuation tank and permeable pavement in the development to deal with surface water, but no apparent SW network. However, the northeast of the development drains to a large SW network that also serves the Rosconnell development and half of the Roseberry Hill estate. This SW network drains east into a separate SW network in Catchment E.

- Roseberry Hill estate and Scoil na Naoimh Uilig drain to well-connected SW networks which terminate at Rickardstown Road. However, catchment topography should cause the surface water to drain southeast into the Rosconnell SW network.
- Surface water in Catchment C flows northwest to southeast, draining into a SW drainage network which runs down the centre of the catchment. The network then connects to a larger drainage network east of the catchment.
- The Roseberry Stream also runs through the catchment and can act as natural surface water drainage for the catchment. Surface water that falls into unzoned lands (under the Newbridge LAP 2013-2019) within the catchment and areas without a drainage network can be directed to drain into the SW drainage network and Roseberry Stream based on the natural slope of the ground.
- A Nature Base Management Areas are proposed at a low point of the catchment. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge into Roseberry Stream. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.5 Catchment D

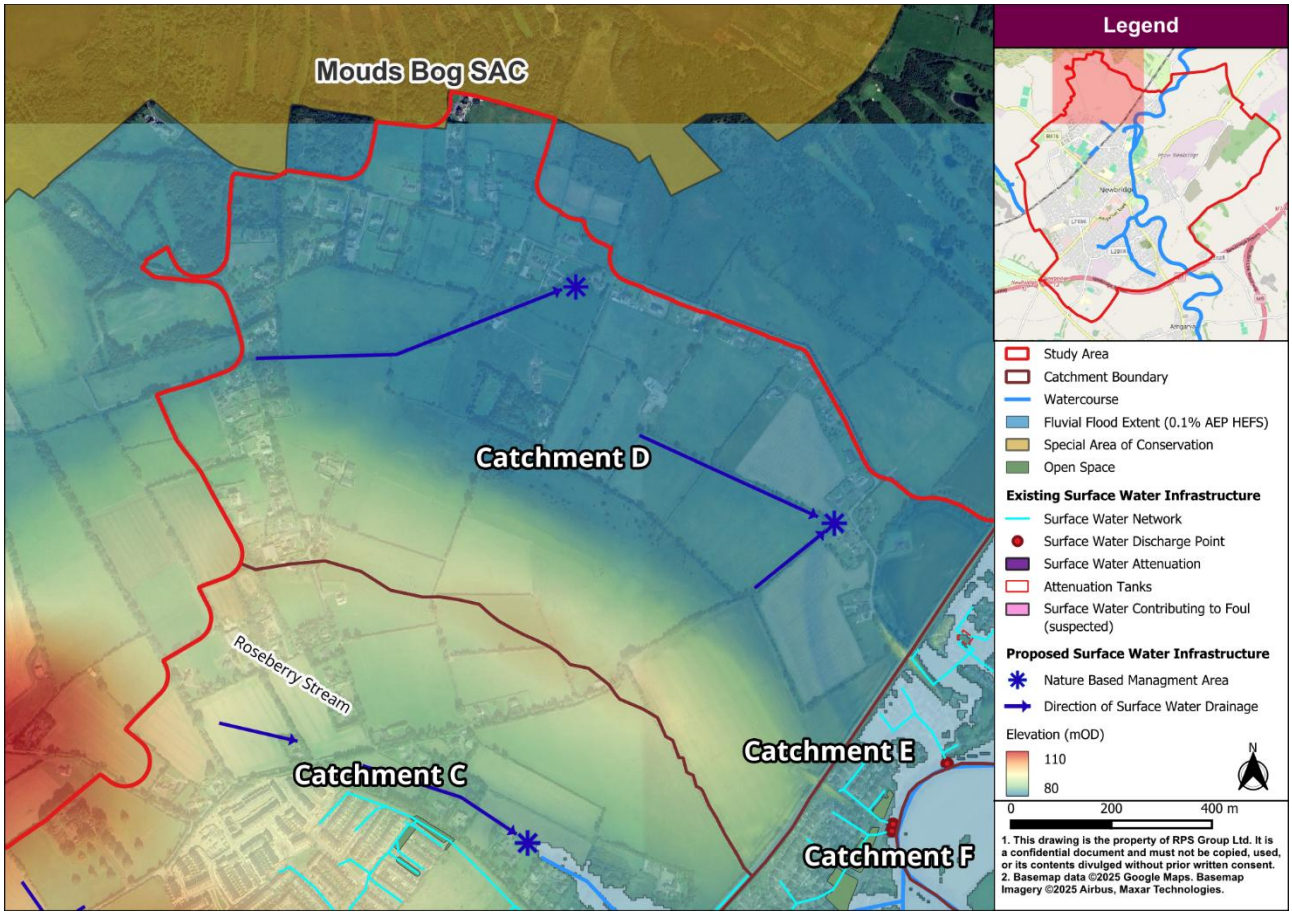


Figure 6-5: Catchment D Surface Water Management

6.5.1 Development Zoning

Catchment D is located in the northernmost extent of the Newbridge study area and consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- I – Agriculture

Satellite mapping indicates that the remainder of the catchment which is unzoned under the 2013-2019 LAP is agricultural in nature.

6.5.2 Proposed Drainage Strategy

- Two Nature Based Management Areas are proposed at low points on the eastern boundary of the catchment. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to help mitigate surface water flooding or pollution of the Mouds Bog SAC to the northeast of the catchment.
- The catchment is indicated to have well-draining soil; therefore, infiltration should be prioritised through bioretention areas, infiltration basins or similar.

6.6 Catchment E

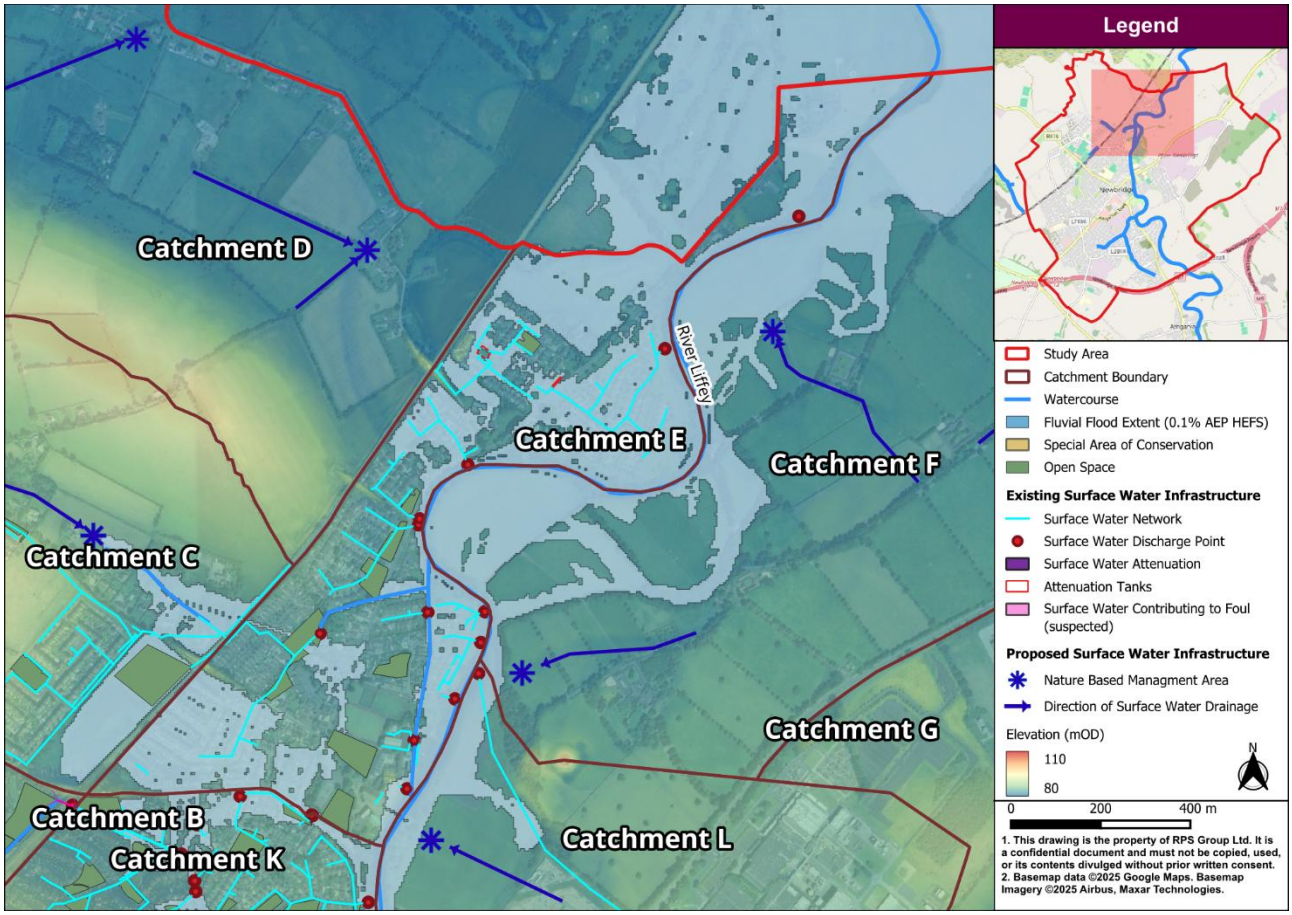


Figure 6-6: Catchment E Surface Water Management

6.6.1 Development Zoning

Catchment E in the Newbridge SWMS study area consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Existing residential areas including Mount Carmel, Ailesbury Park, Riverside Park, Barrettstown Lawns, Old Connell Weir, Barrettstown Meadows, Raymonds Court, Roseberry Court and College Grove
- D – Neighbourhood Centre
- E – Newbridge College
- F – Open Space and Amenity

The north of the catchment is not zoned within the 2013-2019 LAP and is largely agricultural in nature.

6.6.2 Proposed Drainage Strategy

- Catchment E is mainly a residential area which comprises multiple small SW networks. Mount Carmel and Ailesbury Park drain to the same network which flows northeast before discharging to a culvert that runs between Ailesbury Park and Barrettstown Lawns before discharging into the River Liffey to the rear of College Grove.
- Catchment E is largely low-lying in nature and Catchment Flood Risk Assessment and Management (CFRAM) flood mapping indicates a high sensitivity to flooding under climate change conditions.

- College Grove has a small SW network which discharges directly into the River Liffey. Sections of College Grove which are not connected to the network can drain directly into the River Liffey given the sloping nature of the topography.
- Riverside Park, Barrettstown Lawns, Raymonds Court, Roseberry Court, and Old Connell Weir all have individual, well-connected SW networks which discharge directly into the River Liffey.
- Barrettstown Meadows has a well-connected SW network which appears to discharge along the Dublin-Cork railway line. This network may drain into a culvert, but this could not by confirmed via mapping.
- The Newbridge College is located beside the River Liffey and drains off directly into the river through a small SW network. Newbridge College is also bisected by the Rosberry Stream, which can drain off surface water if necessary.
- The River Liffey is located beside the catchment. The natural slope of the catchment ensures that SW that falls anywhere within the catchment naturally drains into the current SW drainage networks or the River Liffey.
- Consideration should be given to utilising green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.7 Catchment F

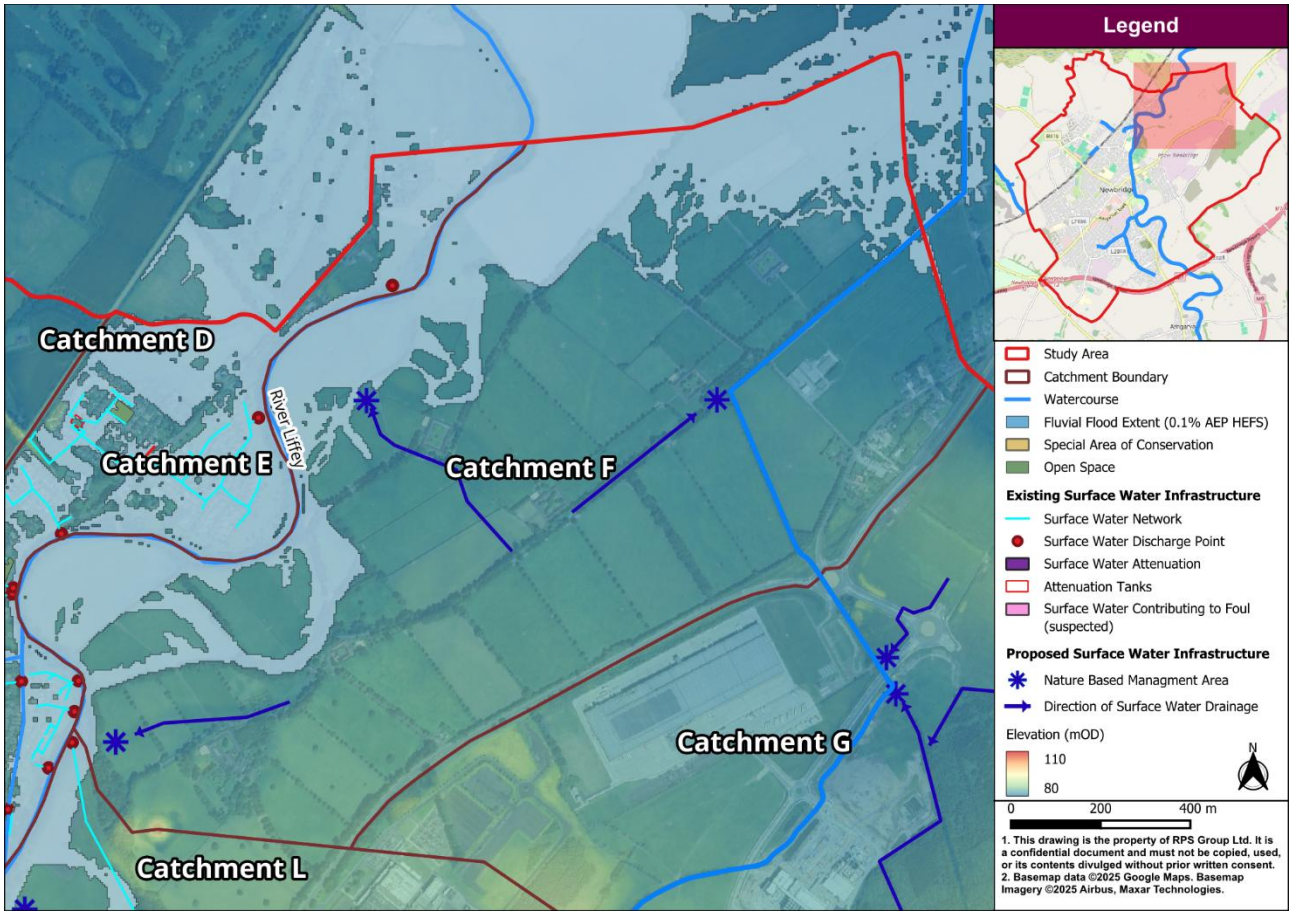


Figure 6-7: Catchment F Surface Water Management

6.7.1 Development Zoning

The Catchment F in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- F – Open Space
- I – Farmland

The land within Catchment F which is not zoned under the 2013-2019 LAP can be determined as agricultural in nature as indicated from mapping.

6.7.2 Proposed Drainage Strategy

- Catchment F is comprised largely of agricultural land located along the banks of the River Liffey. Surface water flooding is of minimal concern in Catchment F and given the zoning of the land and its location, surface water discharge by infiltration is considered the most viable form of drainage. SW that does fall within the catchment is likely to discharge into the River Liffey. In the west of the catchment the natural topography encourages drainage west into the River Liffey. To the east of the catchment surface water drains into a tributary, which later joins the River Liffey outside of the study area.
- Catchments F and G are divided from each other by the R445 Regional Road. There has been one example of historical flooding on the R445 Regional Road within the north of both catchments. However, this issue has been mitigated and flooding no longer occurs in the area.
- Three Nature Based Management Areas are proposed at low points of the catchment adjacent to existing watercourses. Surface-based attenuation and natural water quality treatment measures should

be included prior to discharge of any future surface drainage network to the watercourses. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.8 Catchment G

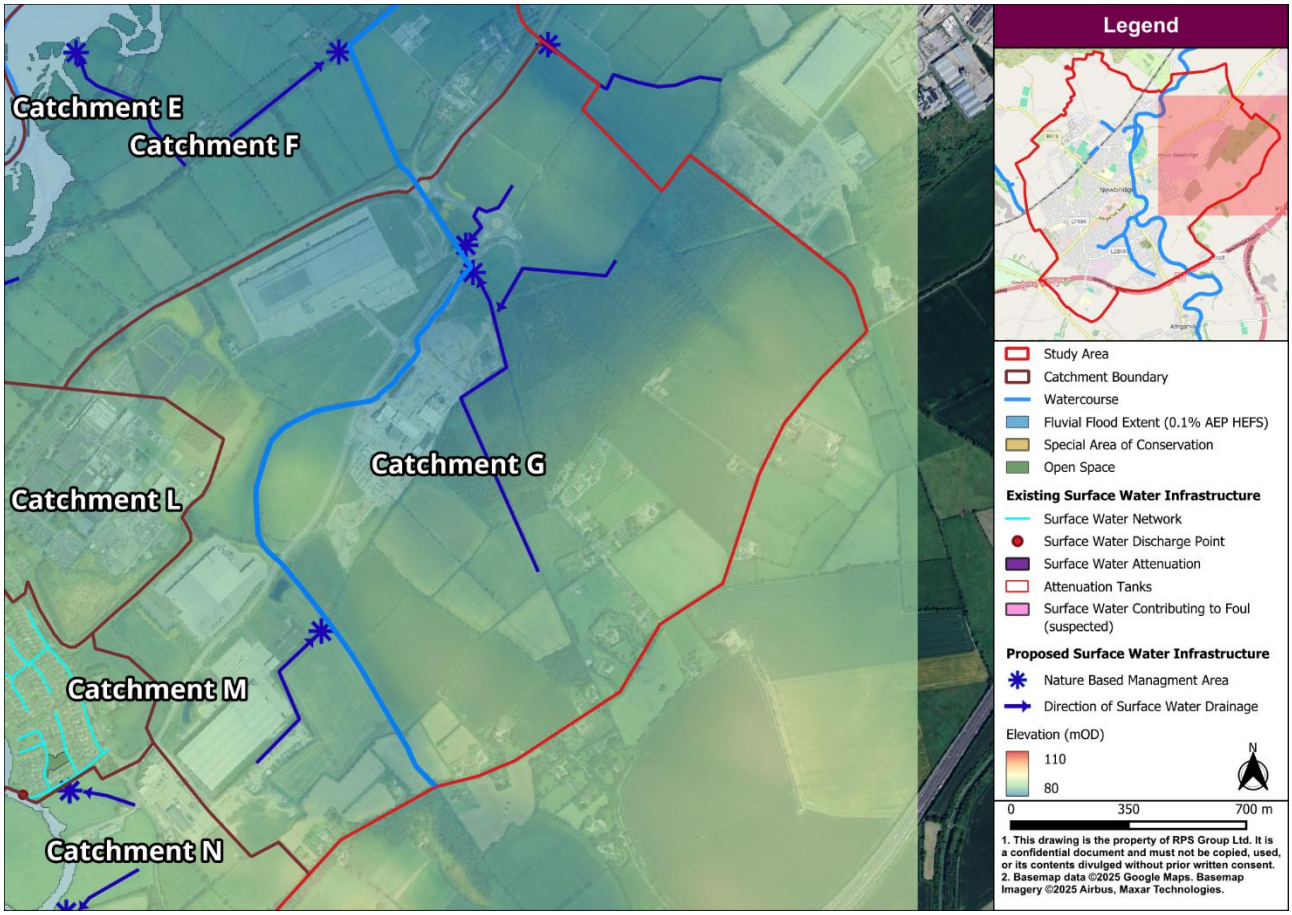


Figure 6-8: Catchment G Surface Water Management

6.8.1 Development Zoning

Catchment G in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- H – Pfizer Newbridge
- H1 – Lidl National Distribution Centre, Diageo Ireland Brewery (under construction)
- I – Farmland

The land within Catchment G which was not zoned under the 2013-2019 LAP is agricultural in nature, as indicated by satellite mapping.

6.8.2 Proposed Drainage Strategy

- Catchment G is comprised largely of agricultural land. Surface water within the catchment flows from southeast to northwest, towards the R445 Regional Road. Given the zoning of the land under the Newbridge 2013-2019 LAP, surface water discharge by infiltration may be the most viable form of drainage within Catchment G. There is no SW networks located near the Lidl National Distribution Centre and the Diageo Ireland Proposed Brewery. However, there is a culvert that runs through the area and can be used to divert surface water onto agricultural land as necessary.
- Four Nature Based Management Areas are proposed at low points of the catchment adjacent to existing watercourses. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourses. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.9 Catchment H and Catchment I

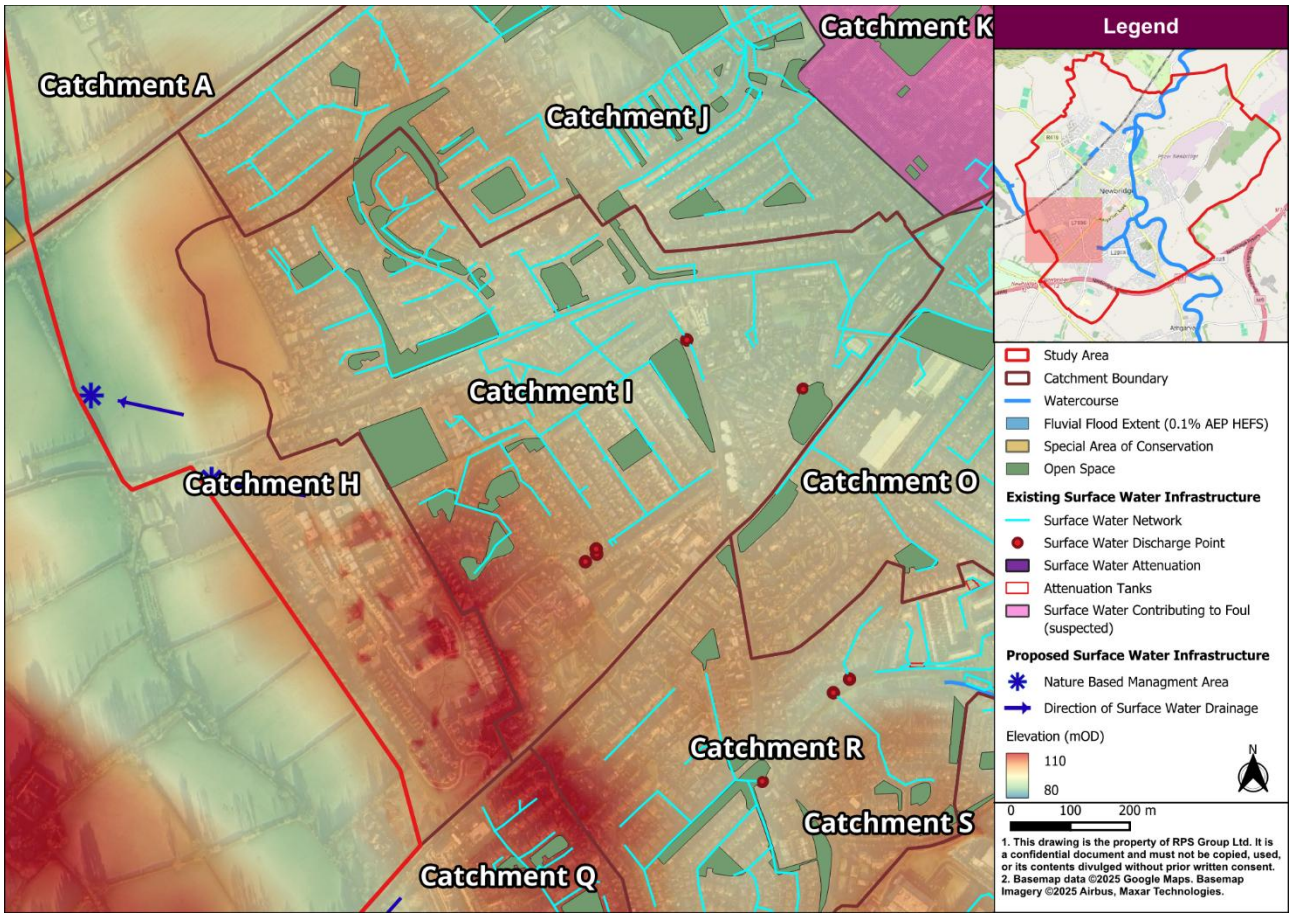


Figure 6-9: Catchments H and I Surface Water Management

6.9.1 Development Zoning

The catchments H and I in the study area consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Existing residential areas including The Oaks, The Elms, Acorn Downs, Standhouse Lawns, The Seven Springs, Morristown Estate, Pinewood Close, Moorefield Crescent, Moorfield and Moorefield Road
- C2 – Curragh Farm residential estate
- D – Neighbourhood Centre
- E – Scoil Mhuire Senior School, St Patrick's Church
- F – Open Space and Amenity
- I – Farmland
- J – Transport and Utilities
- L – The Keadeen Hotel
- R – Commercial and Retail

6.9.2 Proposed Drainage Strategy

- Catchment H is situated in the west of the Newbridge SWMS area while Catchment I is located just west of the town centre. The Oaks, Acorn Downs, Standhouse Lawns, Morristown Estate, The Seven Springs, Pinewood Close, and Moorefield Road housing estates and Scoil Mhuire Senior School all drain via one well-connected SW network within Catchment I, which drains east along Standhouse Road before travelling down Athgarvan Road in Catchment O.
- The Elms housing estate drains via a SW network that terminates at the entrance of the estate. However, given the sloping topography of the catchment the SW network likely drains to a branch of the larger SW network at either the Oaks estate or Scoil Mhuire Senior School.
- The residential and commercial zoned land located west of Langton Road within the catchment, including Pinewood Close, Standhouse Road, Moorefield Crescent, St Patrick's Church and the R445 Regional Road, drains by both the SW drainage network and the Upper Liffey Valley Sewerage Scheme (ULVSS). The two networks may connect, but such connections are unclear.
- The Keadeen Hotel and properties along the R445 Regional Road leading east to Moorefield Crossroads are not connected to a SW network but drain northeast along the R445 before joining the ULVSS. Similarly, surface water also flows down the L7036 Local Road before draining into either the ULVSS or the SW network at Standhouse Road. The topography of the catchment ensures that SW that falls within the catchment drains towards one of these two networks.
- Catchment H, located along the western border of the study area is comprised of agricultural land in the north and the recently built Curragh Farm residential estate in the south. It would be appropriate to implement surface water treatment infrastructure in the north of the catchment, to protect the Cloncumber Stream and the Pollardstown Fen SAC from surface water runoff from the town.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.10 Catchment J

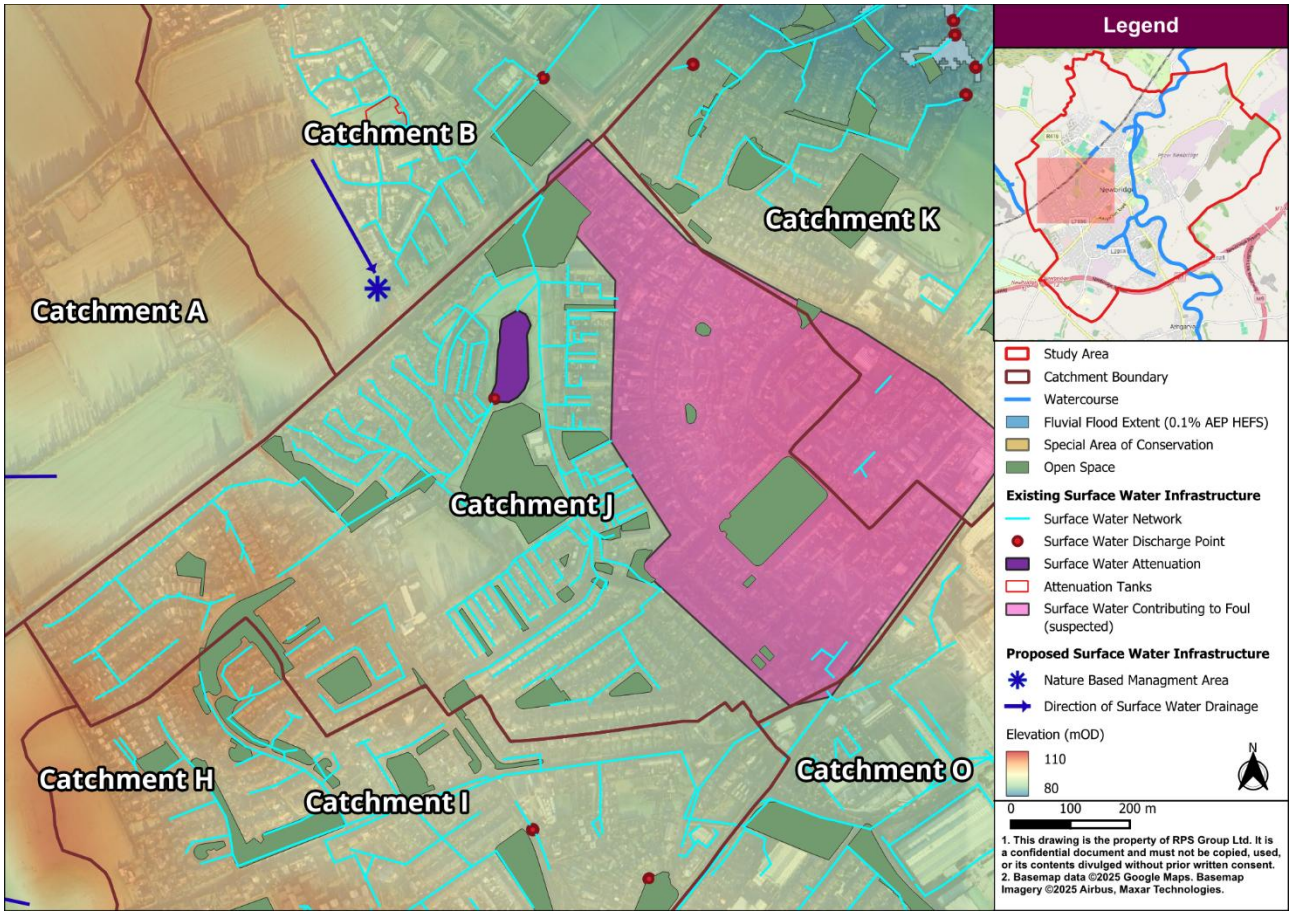


Figure 6-10: Catchment J Surface Water Management

6.10.1 Development Zoning

The catchment J in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- A – Moorefield Road
- B – Existing residential areas including Allen View Heights, Cedarwood Park, Highfield Estate, Moorefield Drive, Lakeside Park, Dara Park, Beechwood Avenue, Piercetown, Station Road, and Pairc Mhuire
- C3 – Undeveloped greenfield site
- D – Neighbourhood Centre
- E – St Patrick's National School, Moorefield Medical Centre, Newbridge Sports and Leisure Centre
- F – Open Space
- R – Commercial and Retail

6.10.2 Proposed Drainage Strategy

- Catchment J consists largely of residential land with commercial development located within the very east of the catchment. Allen View Heights, Lakeside Park, Highfield Estate, Moorefield Drive and Dara Park housing estates all drain into one well-developed SW drainage network that drains north towards Catchment B. Cedarwood Park and Beechwood Avenue have partial SW networks as well, which likely drain down Morristown Road into the larger SW network.
- The east of the catchment, namely the residential developments of Piercetown and along Station Road are served by the Upper Liffey Valley Sewerage Scheme (ULVSS). The ULVSS drains southbound within Catchment J, before draining east towards the River Liffey.
- The catchment also contains plenty of green open space, in Dara Park and Pairc Mhuire. The sloping topography of the catchment ensures that surface water falling within the catchment drains into the SW drainage network. The residential and commercial property located on Moorfield Road to the east of Catchment J and parts of Pairc Mhuire estate are suspected to drain into the Uisce Éireann foul drainage network. Further engagement and collaborative management with Uisce Éireann is required to develop a cohesive strategy to surface water management in this area.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.11 Catchment K

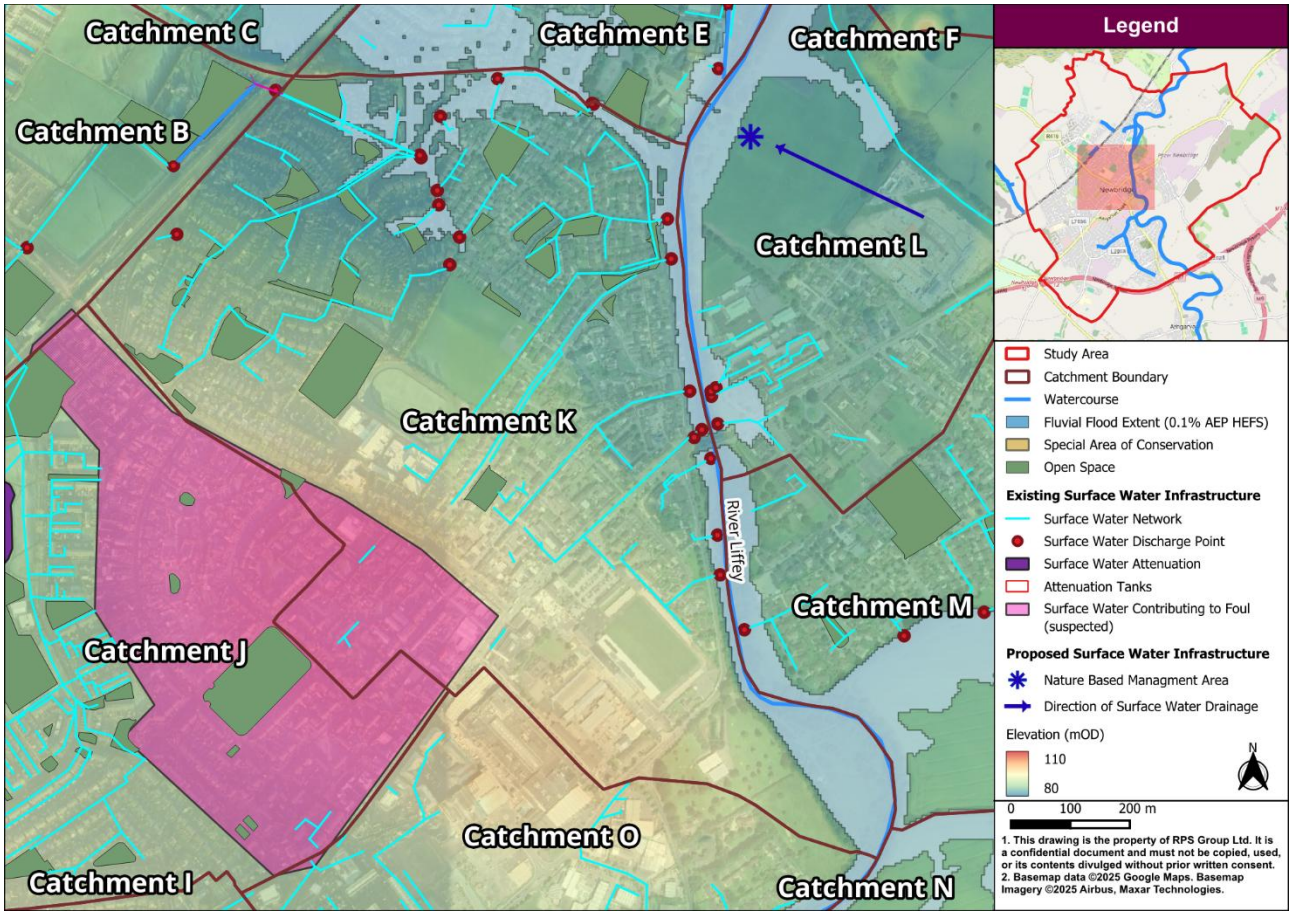


Figure 6-11: Catchment K Surface Water Management

6.11.1 Development Zoning

The catchment K in the Newbridge SWMS consists of the following land uses zoning designations under the Newbridge LAP 2013-2019:

- A – Bord na Mona, St Conleth's Park, Main Street, Eyre Street, Henry Street
- B – Existing residential areas including College Farm, Sarsfield Drive, The Great Southern, College Orchard, The Grange, The Priory, St Dominic's Park, College Park, St Joseph's Avenue and Roseville Court
- E – St Conleth's Vocational School, Newbridge Sports and Leisure Centre, Ryston Sports and Social Club
- F – Open Space and Amenity
- J – Newbridge Train Station

6.11.2 Proposed Drainage Strategy

- Catchment K is located in the centre of Newbridge, along the banks of the River Liffey. The catchment is comprised in near equal parts commercial land and residential land. The College Farm residential estate and College Orchard Estate at the north of the catchment drain to one discharge point in the River Liffey on the southern border of Newbridge College. The SW networks for the respective estates drain to a culvert that runs behind College Orchard residential estate and drains to the SW network that runs down Sex's Road.
- The Grange Estate drains to a well-connected W network which discharges straight into the River Liffey at Sex's Road. Similarly, St Conleth's Vocational School drains to a SW network along the east of the property and discharges into the River Liffey where College Park Road meets Sex's Road.
- St Joseph's Avenue and Roseville Court do not drain directly to a SW network, but given the sloping nature of the catchment, surface water from the two estates can drain down Henry Street and Main Street to join the SW network on Main Street.
- The commercial area at the south of the catchment drains into a SW network along Eyre Street and Main Street respectively. Given the sloping nature of the catchment, commercial properties located at Charlotte Street, Edward Street and Cutlery Road drain towards SW networks on Eyre Street and Main Street.
- The Ryston Sports and Social Club and Newbridge Town Park are considered appropriate for surface water discharge by infiltration given their zoning and location and would be suitable locations for NBS. Newbridge Town Park also drains straight into the River Liffey.
- The residential and commercial property located on Moorfield Road to the west of Catchment K and parts of Pairc Mhuire estate are suspected to drain into the Uisce Éireann foul drainage network. Further engagement and collaborative management with Uisce Éireann is required to develop a cohesive strategy to surface water management in this area.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.12 Catchment L

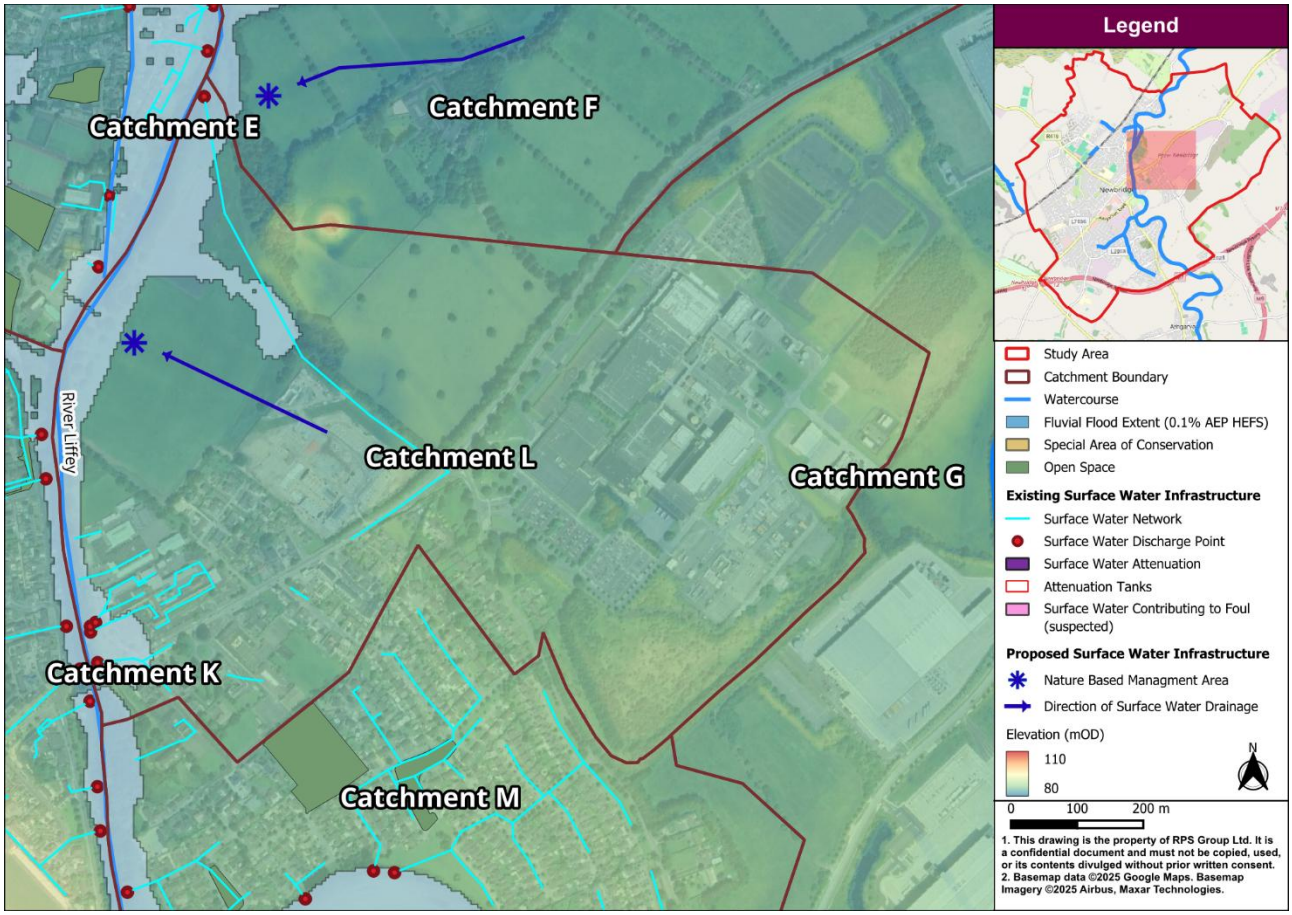


Figure 6-12: Catchment L Surface Water Management

6.12.1 Development Zoning

The catchment L in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Old Connell, Hawthorn Close, Old Connell Gate
- C20 – Residential estate currently under construction
- E – Patrician Catholic Secondary School, St Conleth's Church
- F – Open Space and Amenity
- H – Pfizer Newbridge
- I – Farmland
- J – Transport and Utilities
- R – Commercial and Retail

6.12.2 Proposed Drainage Strategy

- Catchment L is located in the centre of the study area, east of the River Liffey. The Patrician Catholic Secondary School is drained by a well-connected SW network and discharges to the River Liffey just north of St Conleth's Bridge.
- St Conleth's Church drains naturally to the R445 Regional Road as a result of the catchment topography before discharge to the River Liffey just north of Saint Conleth's Bridge via a small SW network. The Old Connell estate, Hawthorn Close and Old Connell Gate estate drain north before discharging to the River Liffey opposite Riverside Park.
- A Nature Based Management Area is proposed at the low point of the catchment adjacent to the River Liffey. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourse. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.13 Catchment M

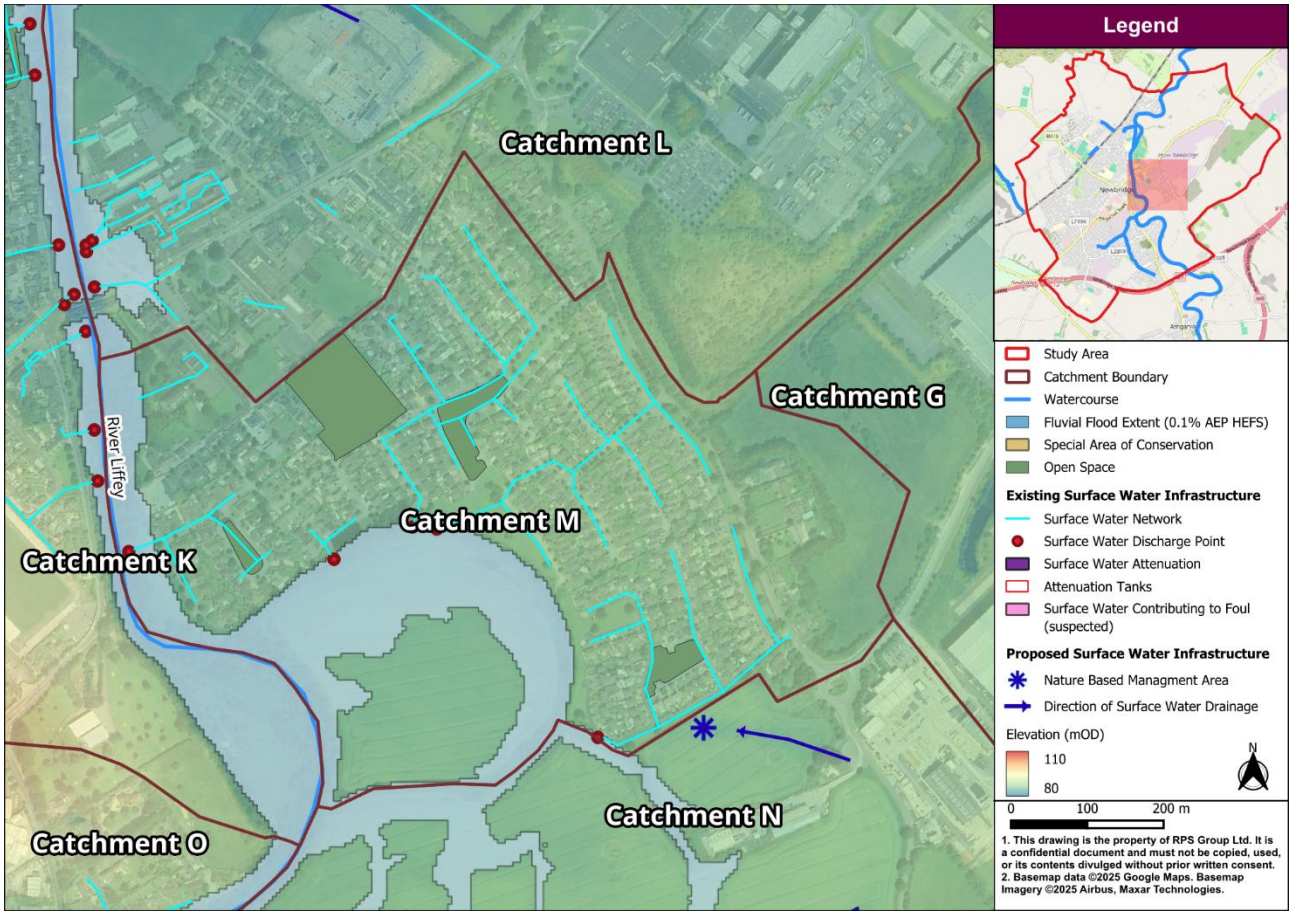


Figure 6-13: Catchment M Surface Water Management

6.13.1 Development Zoning

The catchment M in the Newbridge SWMS and consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Existing residential areas including Baroda Court, Wellesley Manor, Connell Drive, River Court and Liffey Drive
- E – Patrician Catholic Primary School
- F – Open Space and Amenity
- H – Industry and Warehousing

6.13.2 Proposed Drainage Strategy

- Catchment M is well-connected to multiple SW drainage networks serving Baroda Court estate, Wellesley Manor estate, Connell Drive estate and River Court estate respectively. All SW networks discharge directly to the River Liffey to the west of the catchment. Liffey Drive is not served by a SW network. However, the sloping nature of the catchment allows for surface water in Liffey Drive to drain straight into the River Liffey.
- The Patrician Catholic Primary School has its own SW drainage network which discharges straight to the River Liffey.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.14 Catchment N

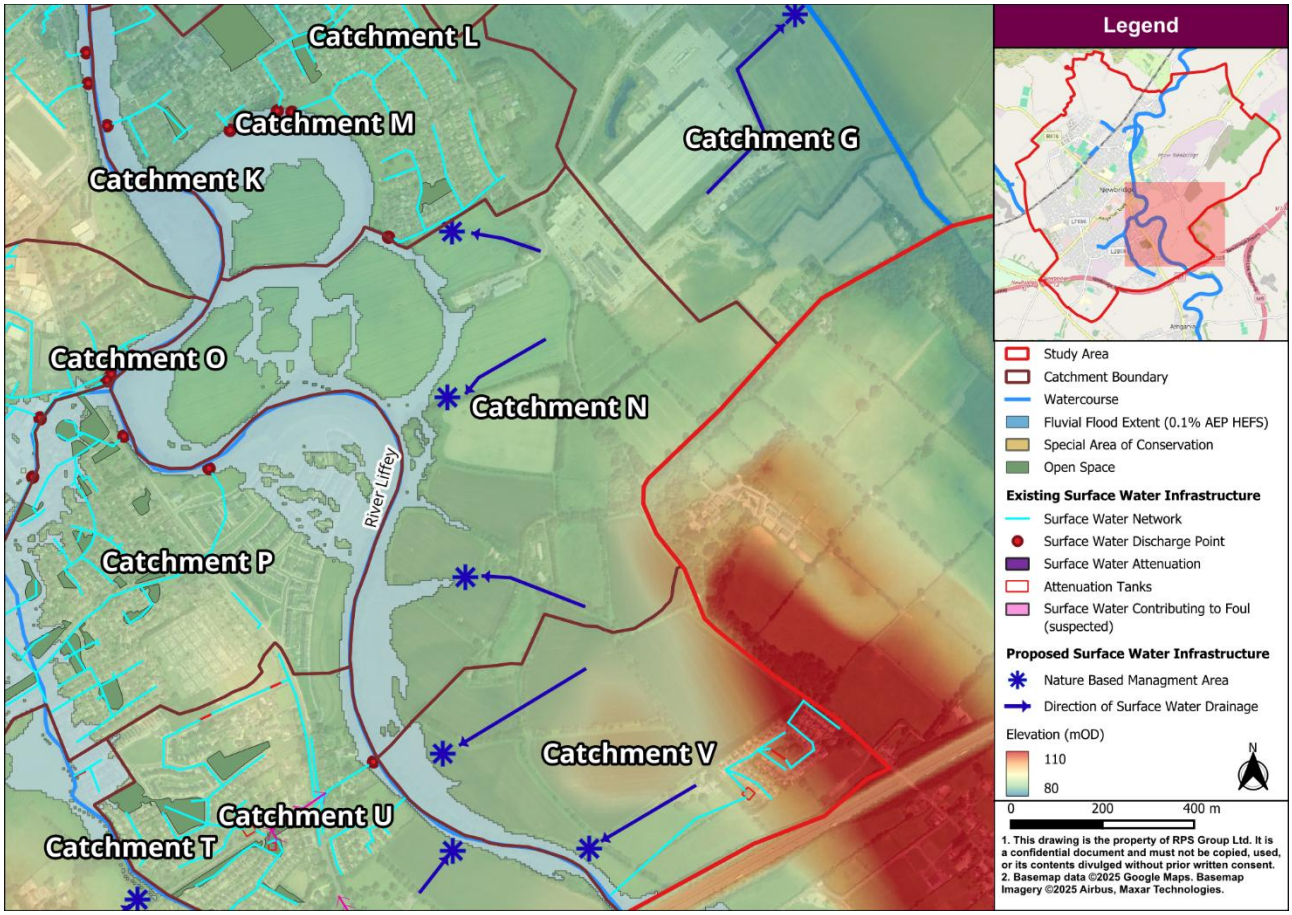


Figure 6-14: Catchment N Surface Water Management

6.14.1 Development Zoning

The catchment N in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- C12, C13 and C14 – Greenfield lands
- F – Open Space
- H – Greenfield lands
- H1 – KDP Ireland, Murphy Ireland Limited
- I – Farmland

6.14.2 Proposed Drainage Strategy

- The Catchment N is located within the east of the study area and is at a low risk of SW flooding. The New Residential land use zonings ofC12, C13 and C14 in Catchment N have not yet been developed and is shown by satellite mapping to comprise of greenfield sites. This land is at low risk of flooding and does not currently require a drainage network. The natural topography of the catchment encourages drainage from the catchment into the River Liffey. The Lidl Distribution Centre and Murphy Ireland Ltd are at reduced risk of SW flooding, and the surrounding land can be used to mitigate surface water by soil infiltration if necessary.
- Three Nature Based Management Areas are proposed at low points of the catchment adjacent to flood extents of the River Liffey. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourse. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.15 Catchment O

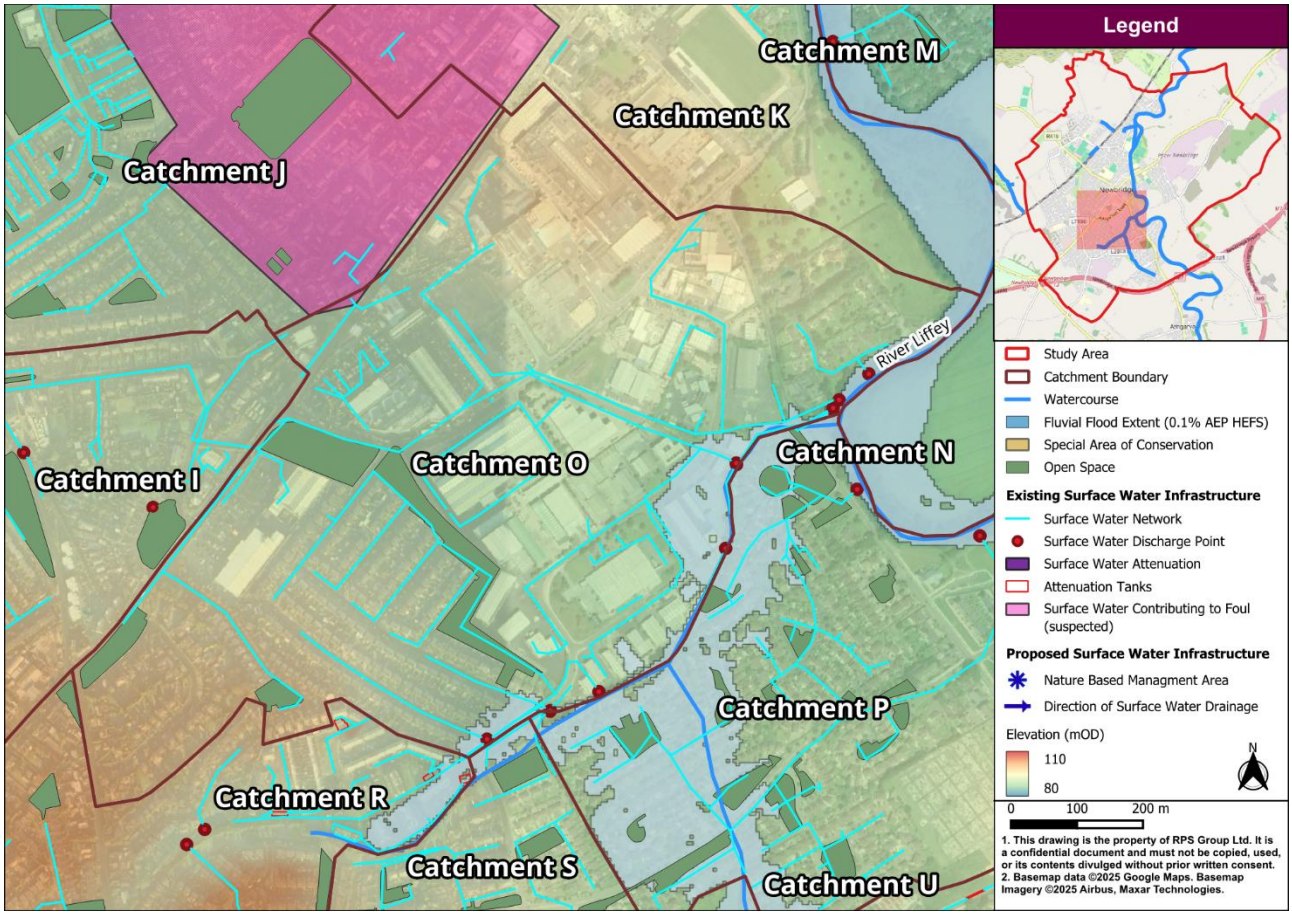


Figure 6-15: Catchment O Surface Water Management

6.15.1 Development Zoning

The catchment O in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- A – Newbridge Silverware, Newbridge Retail Park, Courtyard Shopping Centre, Whitewater Shopping Centre, Newbridge Credit Union, Woodie's, Tesco Superstore, Moorefield Post Office
- B – Existing residential areas including Moorefield Avenue, Moorefield Park, Ryston Close and Moore Park
- E – Ryston's Sports and Social
- F – Open Space
- H – Newbridge Industrial Estate
- J – Transport and Utilities
- Q – Cill Dara Industrial Estate, KARE, Plimley Trading Limited

6.15.2 Proposed Drainage Strategy

- Catchment O is located in the centre of Newbridge and is comprised mainly of commercial and residential development. Moorefield Park drains by a well-connected SW network which drains south before discharging into a culvert that runs along the northern boundary of Catchment P. This culvert then joins a second SW network which discharges into the River Liffey north of Kilbelin Crescent.
- A second SW network drains the majority of the catchment including Moore Avenue, Newbridge Retail Park, the Courtyard Shopping Centre, Newbridge Industrial Estate, Cill Dara Industrial Estate, Newbridge Silverware, and KARE which discharge into the River Liffey on Athgarvan Road, just behind Kilbelin Crescent. This SW network may connect straight to the Upper Liffey Valley Sewerage Scheme (ULVSS) network which also flows from west to east across the catchment along Athgarvan Road and through the Newbridge Industrial Estate.
- Moore Park, though not connected to a SW network, drains north to the ULVSS along the R445 Regional Road due to the catchment's topography. Similarly, Whitewater Shopping Centre drains south and joins the ULVSS network on Athgarvan Road.
- Ryston Close Estate is served by a separate, smaller network which discharges straight to the River Liffey. The topography of the estate ensures that all surface water drains to this network.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.16 Catchment P

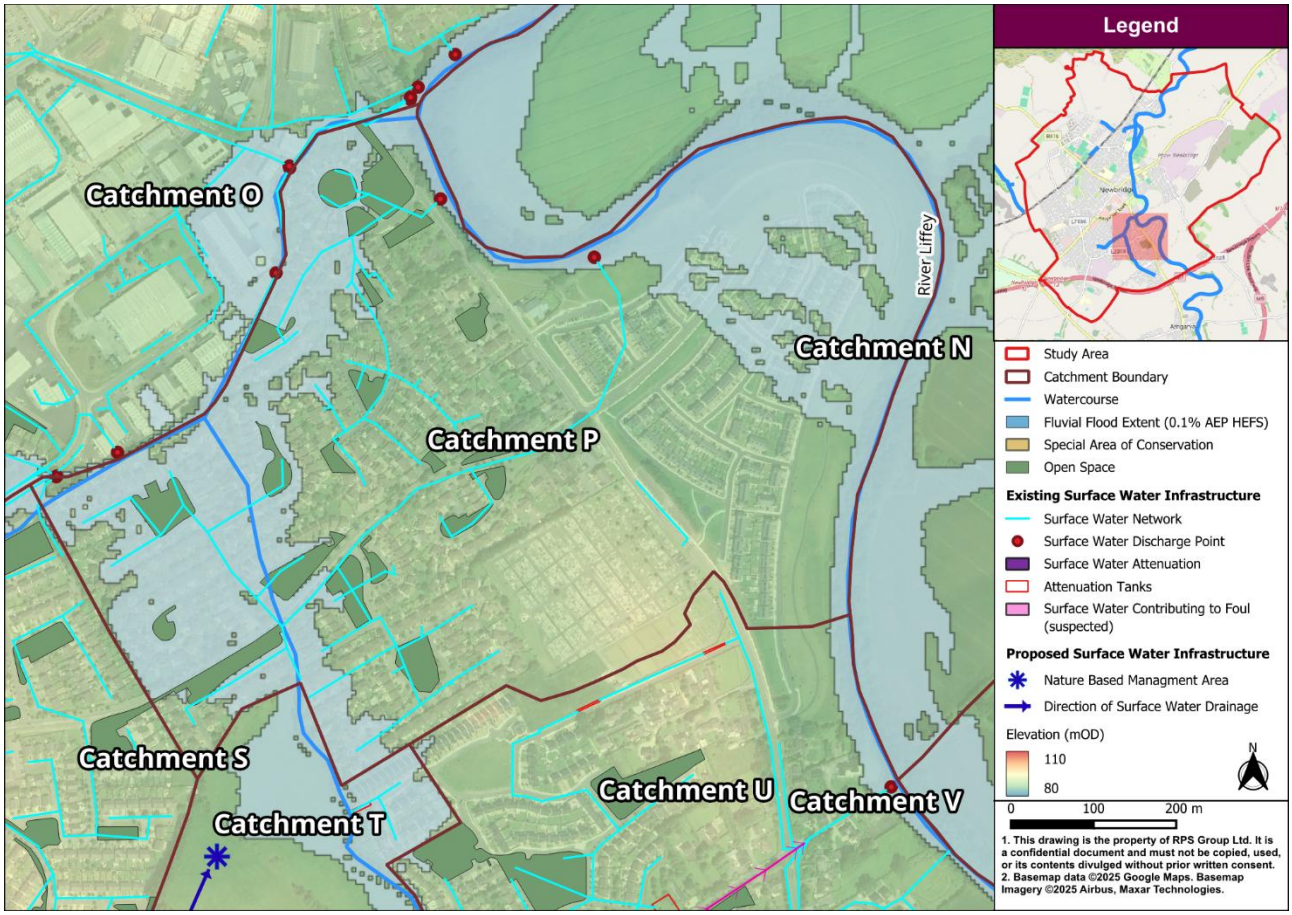


Figure 6-16: Catchment P Surface Water Management

6.16.1 Development Zoning

The catchment P consists of the following land use zoning designations under the Newbridge Lap 2013-2019:

- B – Existing residential areas including Liffey Hall, Kilbelin Park, The Close Riverside Grove
- C15 – Belin Woods residential estate
- E – St Conleth's Cemetery
- F – Open Space and Amenity
- I – Farmland

6.16.2 Proposed Drainage Strategy

- Catchment P is mostly comprised of residential land which is drained via two well-connected SW networks. One network serves Kilbelin Park estate while the other serves the Liffey Park estate and the Close housing estate. Both SW networks discharge straight into the River Liffey. Riverside Grove is not connected to a SW network but can drain down Athgarvan Road into the SW network located where Athgarvan Road meets the L2003 Local Road.
- The lands zoned C15 contains a recently completed Belin Woods residential estate which can partially drain via one of the pre-existing SW networks at the east of the development. The development is also located next to the River Liffey which it can discharge surface water to. There is, however, no SW network associated with the development.
- The Newbridge Stream also flows from south to north through the catchment across the Liffey Hall estate and along its northern border and can drain off any surface water not drained by the SW networks.
- St Conleth's Cemetery is not at risk of flooding and any surface water can drain down to Athgarvan Road and into the SW network there.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.17 Catchment Q

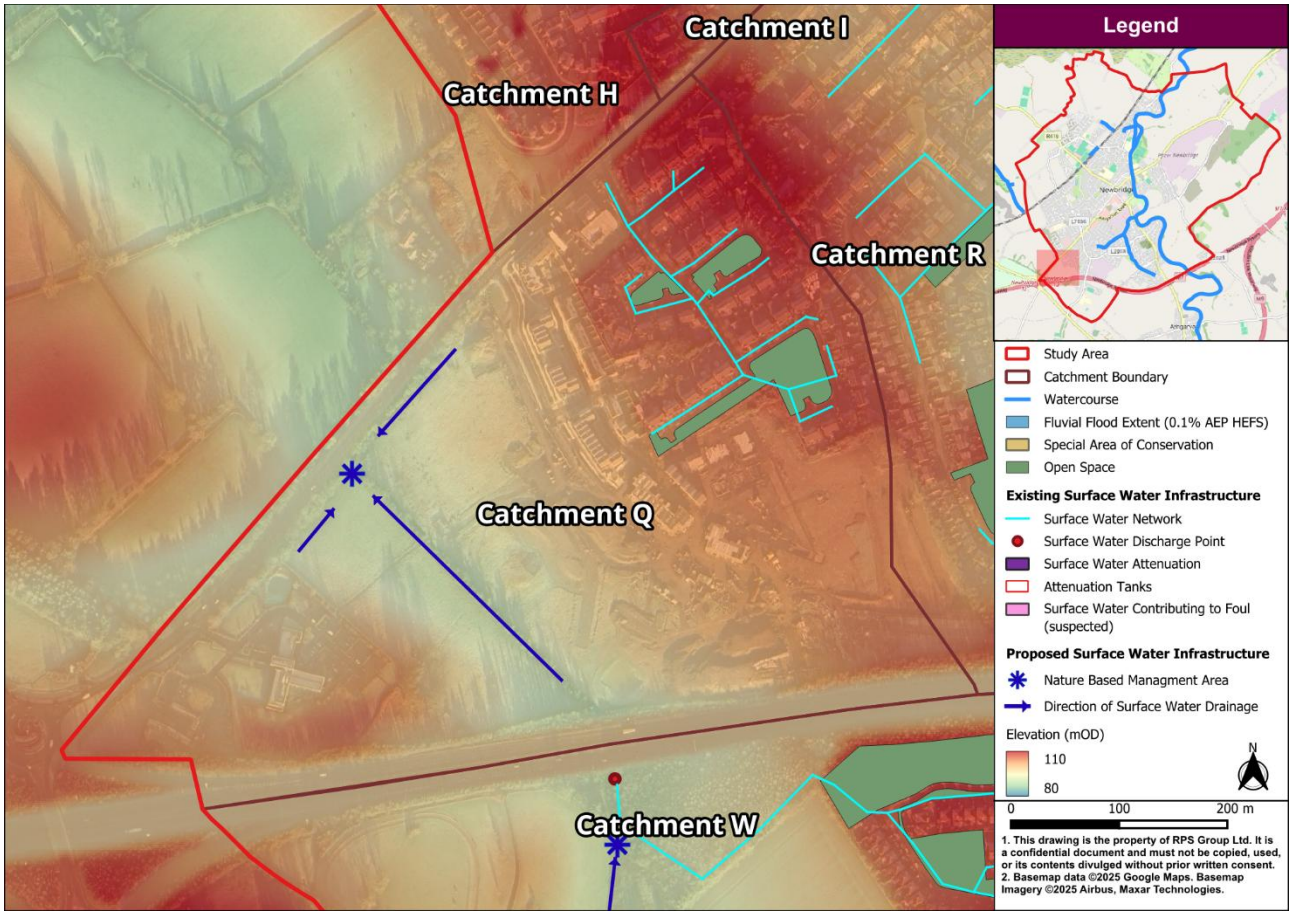


Figure 6-17: Catchment Q Surface Water Management

6.17.1 Development Zoning

The Catchment Q consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Ballymany Manor residential estate
- C1 –Pairc Na Manach residential estate (under construction)
- F – Open Space
- J – Maxol Service Station
- I – Farmland
- V – Horse Racing Ireland and Tote Ireland Limited

6.17.2 Proposed Drainage Strategy

- Catchment Q is located with the southwest of the study area and comprises one residential estate, Ballymany Manor, which is drained by a well-connected SW drainage network. The SW network discharges onto the neighbouring agricultural land. The risk of surface water flooding in this catchment is considered low.
- The neighbouring Pairc Na Manach housing development is at the time of writing still under construction. The development currently does not have a SW network, but this may be subject to change upon completion of the development.
- A Nature Based Management Area is proposed at the low point of the catchment. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network. As there is no recognised existing surface watercourse, infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.18 Catchment R

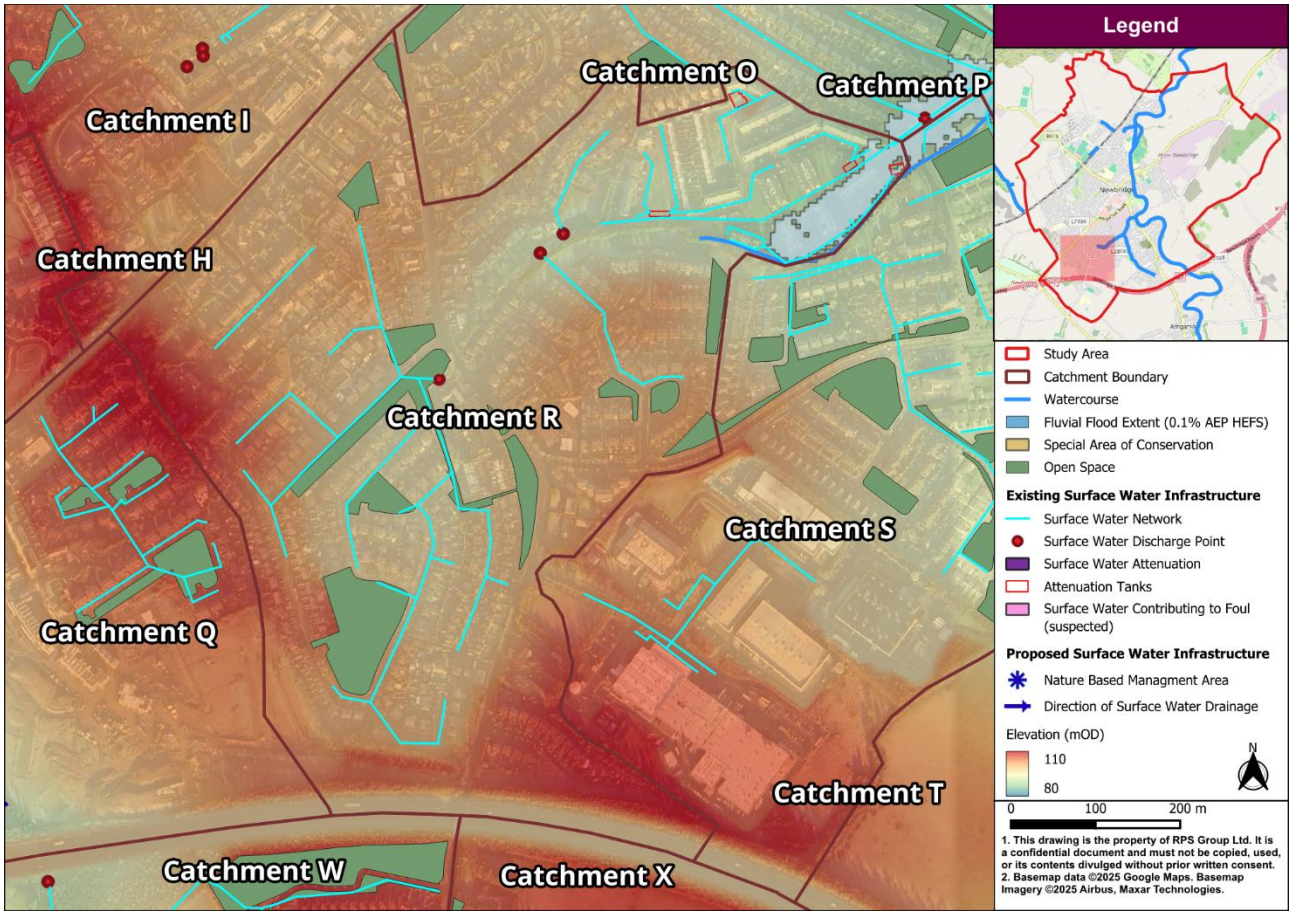


Figure 6-18: Catchment R Surface Water Management

6.18.1 Development Zoning

The Catchment R in the Newbridge SWMS consist of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Residential estates including Ballymany Park, Langton Park, Rathcurragh, Beechmount, Beechmount Court, The Village, Millfield Manor, The Hawthorn, Grange Heights
- C1 – A portion of Pairc Na Manach residential estate (under construction)
- C19 – Millfield Manor residential estate
- F – Open Space and Amenity
- H – Proctor and Gamble Newbridge

6.18.2 Proposed Drainage Strategy

- Catchment R is located within the southwest of the study area and consists mostly of residential land. The catchment is partially drained by multiple SW networks. Langton Park and Rathcurragh residential estates are served by one SW network which terminates at Green Road. However, it appears to drain into a culvert which runs along the back of Beechmount Court estate, which also drains to this culvert.
- Grange Heights and the Newbridge Southern Relief Road appear to drain northwards, up Green Road and into the Beechmount Court culvert as well. Similarly, the Village and Beechmount estates drain to the culvert via SW network and natural sloping. The culvert flows eastward and appears to drain to the SW network associated with the Millfield Manor and The Hawthorn residential estates at the northeast of the catchment. The culvert may also discharge straight to the Great Connell Stream, which flows eastwards towards the River Liffey.
- Surface water in Ballymany Park appears to drain either straight to the Langton Park SW network or flows to the Moorefield Crosshairs before draining to the Upper Liffey Valley Sewerage Scheme (ULVSS) network.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.19 Catchment S

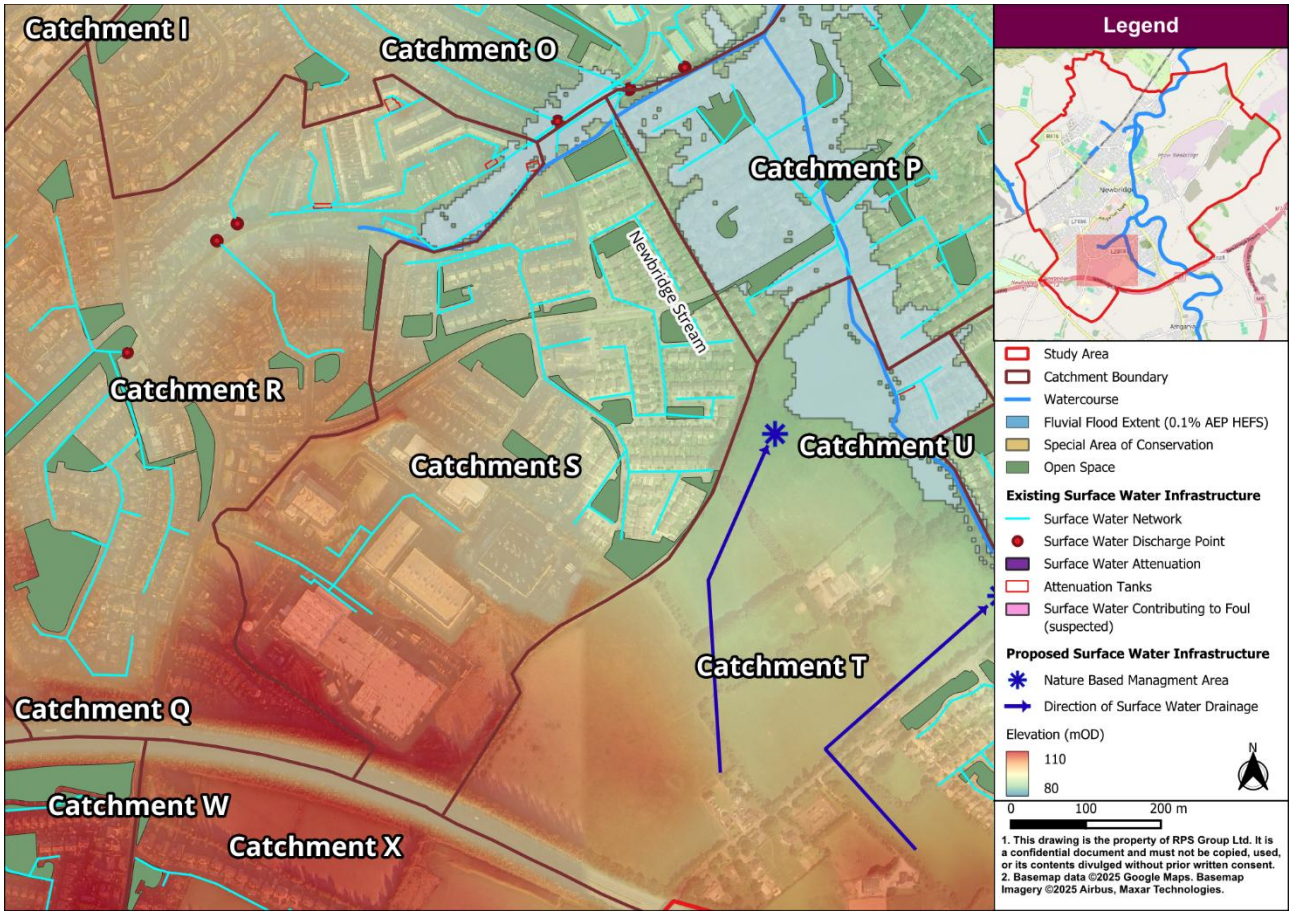


Figure 6-19: Catchments S Surface Water Management

6.19.1 Development Zoning

The Catchment S in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Curragh Grange residential estate
- D – Curragh Grange Shopping Centre
- F – Open Space and Amenity
- H – Proctor and Gamble Newbridge

6.19.2 Proposed Drainage Strategy

- Catchment S is located within the south of Newbridge and is comprised of equal parts residential and industrial land. The Curragh Grange residential estate is drained by two well-connected SW networks. One SW network drains northward to the culvert that runs behind the Liffey Hall residential estate in Catchment P.
- The second SW network drains the Hall, the Crescent and the Grove areas of the Curragh Grange residential estate and appears to terminate within the north of the catchment. However, it may drain north into the Great Connell Stream or east to the neighbouring SW network.

  The Mapaex Ireland (formerly Proctor and Gamble) industrial site has its own SW network, which potentially drains northward.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.20 Catchment T

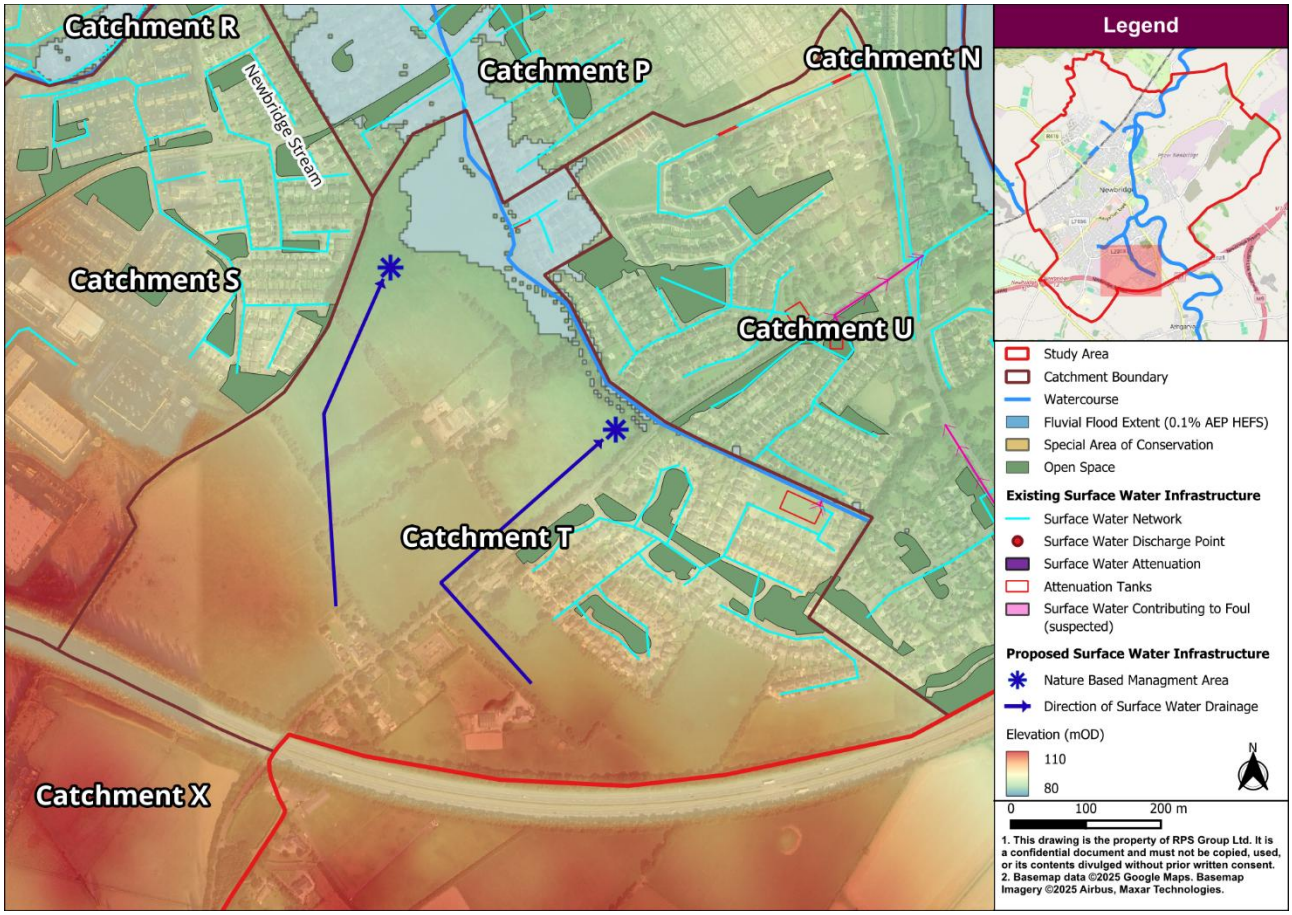


Figure 6-20: Catchments T Surface Water Management

6.20.1 Development Zoning

Catchment T in the Newbridge SWMS consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B –Walshestown Park estate
- C17 – Greenfield Site
- C18 – Kilbelin Abbey
- D1 – Neighbourhood Centre
- E – Greenfield lands
- F – Open Space and Amenity
- H2 – Greenfield lands
- I – Farmland

6.20.2 Proposed Drainage Strategy

- Catchment T is largely comprised of agricultural and industrial land, though mapping indicates it is currently largely greenfield in nature. The catchment could be suitable for surface water attenuation by soil infiltration, along the southwest of the catchment. The Newbridge Stream runs along the northeastern border of the catchment and can also be used for additional surface water drainage if necessary.
- A well-connected SW network drains the Walshestown Park estate into an attenuation tank to the northeast of the estate, neighbouring the Belmont Green estate. The attenuation tank appears to discharge into the Newbridge Stream.
- A second, smaller SW network drains the northwestern portion of the Kilbelin Abbey estate into an attenuation tank. The attenuation tank appears to discharge into the Newbridge Stream.
- Two Nature Based Management Areas are proposed at low points of the catchment adjacent to Newbridge Stream. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourse. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.21 Catchment U

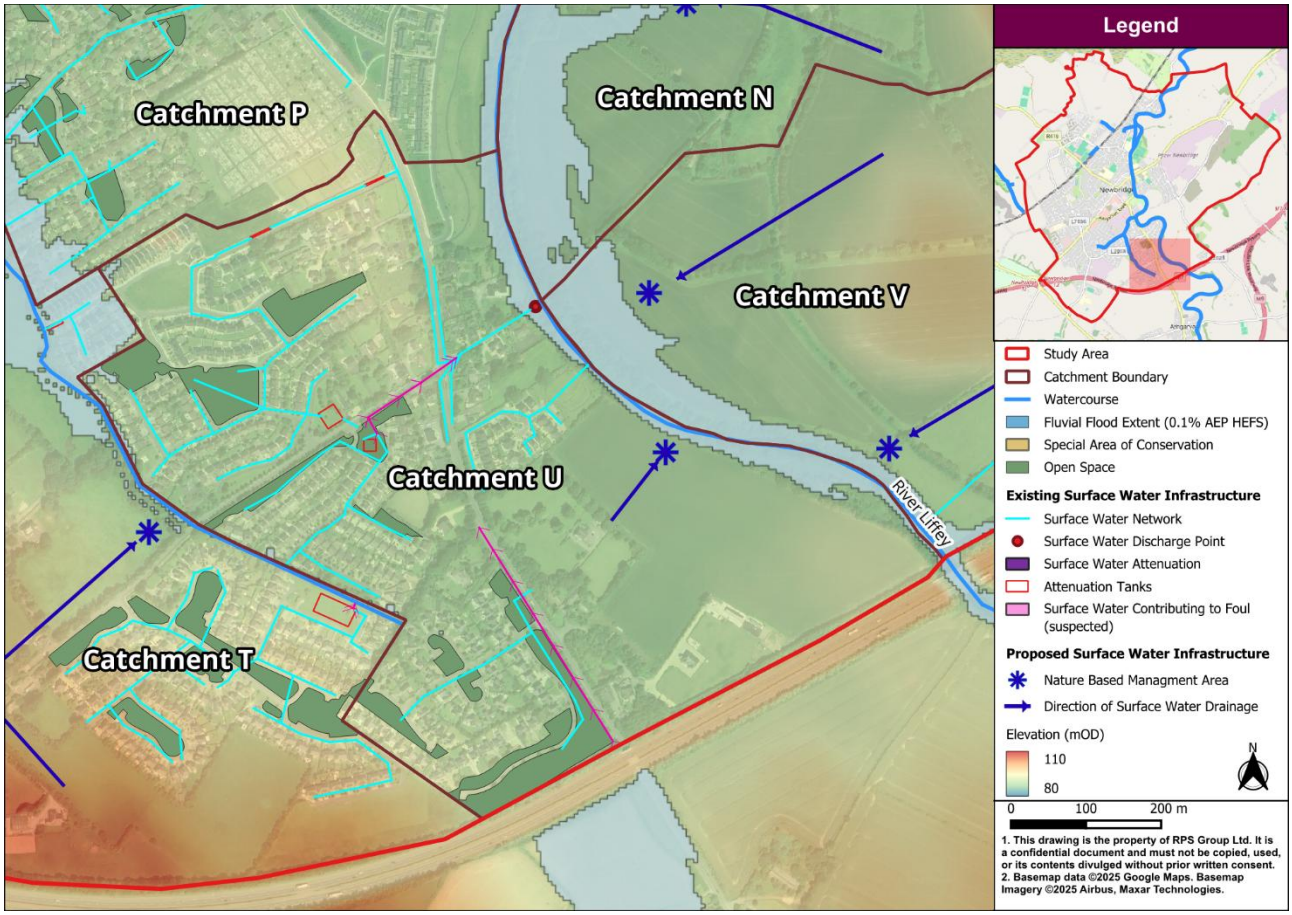


Figure 6-21: Catchment U Surface Water Management

6.21.1 Development Zoning

Catchment U consists of the following land use zoning designations under the Newbridge LAP 2013-2019:

- B – Cottage Veterinary Clinic and residential estates including: Kilbelin Abbey, Walshestown, Walshestown Park, Walshestown Abbey and Belmont Green
- C16 – Walshestown Meadows residential estate
- C18 – Kilbelin Abbey
- E – Community and Education
- F – Open Space and Amenity
- D1 – Neighbourhood Centre
- I – Farmland

6.21.2 Proposed Drainage Strategy

- Catchment U is located in the southeast of the study area and features mainly residential and agricultural land. The catchment is bisected by the Newbridge Stream which flows northward through the catchment. Kilbelin Abbey estate and Belmont Green estate drain by two well-connected SW networks which both terminate at the L7042 Local Road. The two networks appear to drain northeast to the SW network at Walshestown Crossroads which discharges River Liffey just east of the Walshestown Crossroads. Walshestown Abbey drains via a SW network which terminates at the R416 Regional Road, but given the catchment topography, it likely drains straight to the River Liffey or through Walshestown Meadows. The surrounding land is greenfield in nature and is considered at low risk of SW flooding.
- Walshestown Park has a well-connected SW network which discharges into an attenuation tank. This attenuation tank may connect to the Newbridge Stream or to the SW network serving Belmont Green.
- A Nature Based Management Area is proposed at the low point of the catchment adjacent to the River Liffey. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourse. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

6.22 Catchment V

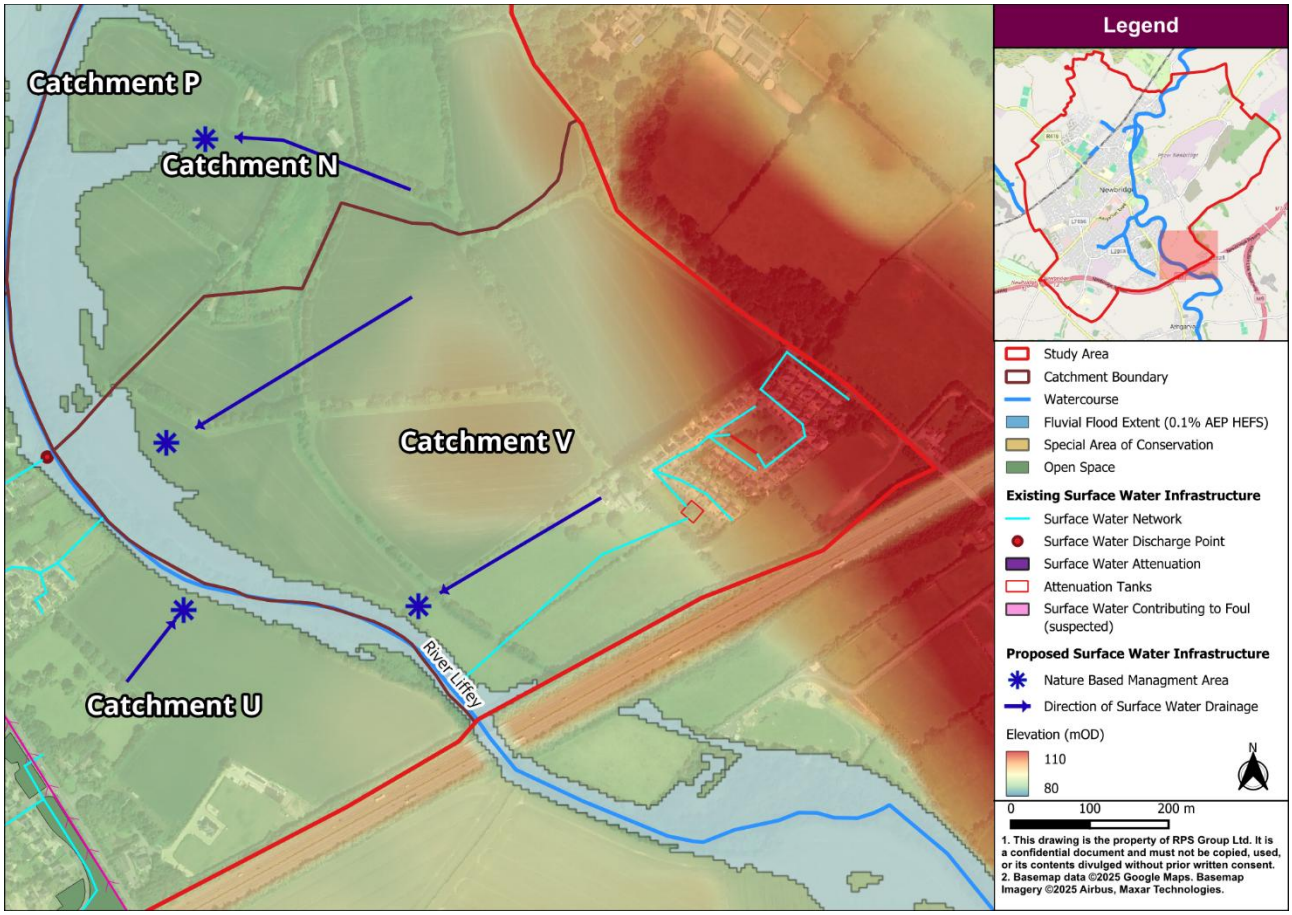


Figure 6-22: Catchment V Surface Water Management

6.22.1 Development Zoning

Catchment V consists of the following zoning designations under the Newbridge LAP 2013-2019:

- B – Old Abbey Manor residential estate
- F – Open Space and Amenity
- I – Farmland

6.22.2 Proposed Drainage Strategy

- Catchment V is located within the southeast of the Newbridge SWMS study area and is largely comprised of agricultural land. The catchment has one residential estate, Old Abbey Manor, which drains to a well-connected SW drainage network. This SW network discharges to an attenuation tank which then drains west and discharges straight to the River Liffey. Catchment V is at low risk of surface water flooding.
- Two Nature Based Management Area are proposed at the low points of the catchment adjacent to the existing flood extents of the River Liffey. Surface-based attenuation and natural water quality treatment measures should be included prior to discharge of any future surface drainage network to the watercourse. Infiltration should be prioritised through bioretention areas, infiltration basins or similar where possible.

6.23 Catchments W and X

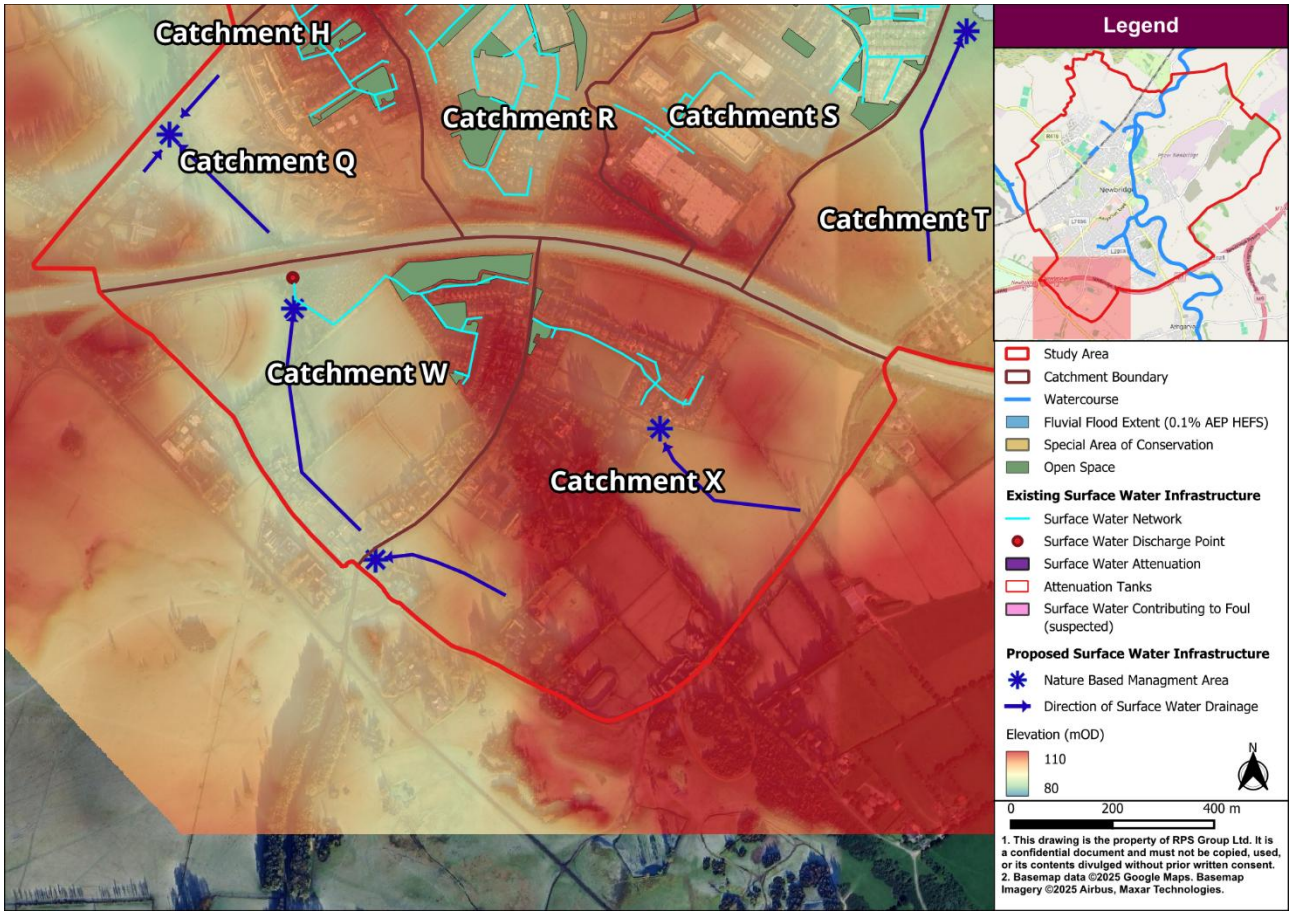


Figure 6-23: Catchments W and X Surface Water Management

6.23.1 Development Zoning

The majority of the area within Catchment W and Catchment X is not zoned under the Newbridge LAP 2013-2019. However, the following zones do apply:

Catchment W:

- B – Greenmount Park residential estate
- F – Open Space and Amenity

Catchment X:

- B – Crotanstown Grange residential estate
- F – Open Space and Amenity

6.23.2 Proposed Drainage Strategy

- Catchment W is located at the southernmost point of the Newbridge SWMS area and is largely comprised of agricultural land. The catchment has one residential estate, Greenmount Park, which drains to a SW drainage network. This SW network discharges to greenfield lands bordering the Newbridge Bypass (M7 Motorway). Though not explicitly stated, it appears to discharge surface water via soil infiltration.
- Catchment X is located at the southernmost point of the Newbridge SWMS and is largely comprised of agricultural land. The catchment has one residential estate, Crotanstown Grange, which drains to a SW drainage network. This SW network discharges to an attenuation tank within the estate.
- Nature-Based Management Areas (NBMAs) are proposed at low points within the catchments to include surface water catchment not connected to the existing drainage network. There is no obvious outlet for NBMAs at these locations. However, the catchments are indicated to have well-draining soil, therefore infiltration is proposed through bioretention areas, infiltration basins or similar.
- Consideration should be given to utilise green areas within public open space as multi-purpose spaces to include surface water attenuation to help improve the resilience of the system and maintain capacity under likely climate change scenarios.

7 CONCLUSIONS

7.1 Conclusions

- Data was collected by desktop assessment and provided by Kildare County Council (KCC). Information was collected on surface water management for various permitted developments which at the time of writing are either completed or under construction.
- The data gathered includes information on the surface water drainage infrastructure within the study area. Some data gaps remain due to unavailable records at the time of writing.
- A separate sewer system serves most of the agglomeration within the study area conveying the surface water of the town to various watercourses. It is suspected that at least one older urbanised area (**Figure 2-1** refers) has surface water contributions to the foul drainage network.
- The natural catchment drainage paths have been altered by urbanisation, construction of the Dublin-Cork railway line and the M7 Motorway.
- Fluvial flooding from the River Liffey is an ongoing concern within the study area.
- This report explores options for sustainably managing surface water in future developments within the study area. A hierarchical approach to managing surface water in discrete sub-catchments is proposed with areas reserved for the implementation of nature-based solutions (NBS).
- The development of NBS in delineated catchment is encouraged, with surface-based conveyances such as swales, rain gardens and open low flow channels utilised to mimic natural drainage processes as closely as possible. The exact locations and discharge routes of proposed NBS are flexible and will be subject to the design and landscaping proposals for each development. Similarly, the routes of the proposed extensions to the surface water network are flexible and will depend on local design considerations.

7.2 Recommendations

- Reserve areas for the proposed NBS and open spaces within study area.
- All the culverts/bridges should be maintained free of debris to avoid blockages.
- Identify opportunities to integrate surface water management objectives with other development projects in the area. For example, the Green and Blue Infrastructure Map, Biodiversity Action Plan and other relevant strategic assessments should take account of the nature-based solutions proposed for managing surface water.
- Require developers to provide an audited SuDS Strategy with their planning applications which takes account of any future surface water masterplan for the town and any recommendations from this report adopted into the Newbridge Settlement Plan.
- Make provision for maintenance of nature-based surface water management solutions by KCC operations staff.
- Complete a capacity assessment if increasing discharges to existing drainage networks.
- Continue to maintain and update accurate digital records of the surface water drainage network through Newbridge and to confirm any areas and assets still contributing surface water to the foul network.
- Conduct an integrated surface water modelling study to represent all potential surface water flooding and connections with the surface water and foul water drainage networks to support the aims of this strategy through quantification of pipe network capacities and to demonstrate practical implementation of the strategy.
- Where surface water contribution to the foul network is confirmed, it is recommended that a Surface Water Separation programme be implemented in Newbridge. The aim of this programme will be separating storm water discharges from the foul network in the identified sub-catchments of Newbridge. Inter-agency collaboration with Uisce Éireann is recommended to incorporate the aims and objectives of the Surface Water Separation Project.