Project:

Old Orchard LRD, Monaleen

Report Title

Drainage Impact Assessment

Document Reference

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1.0 INTRODUCTION

OSL Butler Consulting Engineers (OSL) has prepared this Engineering Services Report on behalf of GLR Property Ltd., for a proposed Residential Development at Old Orchard, Monaleen, Limerick, County Limerick on a circa 3.6-hectare site.

Planning permission was previously granted for a residential development on this site comprising of 113no. residential dwellings and a creche under An Coimsiún Pleanála Reference *ABP 319009-24* (Limerick City and County Council Planning Reference 23/60842) and is currently under construction. This Drainage Impact Assessment forms part of an amendment to the original permission, quoted before.

The site is located to the east of Limerick City Centre, centred at grid reference E: 562059, N: 655886 (ITM) as highlighted in Figure 1 below.



Figure 1: Site Location (Site boundary shown indicatively)

To summarise;

'The proposed development comprises of the modification of the Large-Scale Residential Development granted under Application Ref. 23/60842 and Appeal Ref. ABP-319009-24. The proposed modifications comprise of:

1. *The replacement of 57 no. units comprising of;*
    - *06 no. 4 bed semi-detached houses (139.2 sq.m.)*
    - *15 no. 3 bed semi-detached houses / townhouses (108 sq.m.)*
    - *06 no. 1 and 2 bed apartments (Block A) (54.1 sq.m. – 114.1 sq.m.)*
    - *14 no. 1 and 2 bed apartments (Block B)(54.1 sq.m. – 114.1 sq.m.)*
    - *16 no. 1, 2, and 3 bed apartments (Block D)(50.2 – 123.2 sq.m.)*

    With 59 no. units comprising of;
    - *04 no. 4 bed semi-detached houses (134.0 sq.m.)*
    - *22 no. 3 bed semi-detached houses (104.4 – 108.6 sq.m.)*
    - *04 no. 3 bed semi-detached houses (115.8 sq.m.)*

- *08 no. 3 bed townhouses (109.8 sq.m.)*
- *06 no. 2 bed townhouses (80.2 sq.m.)*
- *15 no. 1 and 2 bed apartments (61.6 – 71.9 sq.m.)*

2. *The provision of 5no. additional townhouse units (2 no. 3 beds and 3 no. 2 beds).*
3. *The omission of the permitted childcare facility with capacity to accommodate 58no. children and the construction of a childcare facility on a site to the west with capacity to accommodate 102no. children.*

The development will also include the provision of private, communal, and public open spaces; internal roads and pathways; pedestrian and cyclist routes; hard and soft landscaping and boundary treatments; waste storage; plant; signage; public lighting; substations; all associated site development works; and all drainage and foul sewer infrastructure and network works including nature-based suds measures.'

The lands are bound to the north and west by the existing Ashfort neighbourhood, to the south by the existing Evanwood neighbourhood and to the east by the existing Kylemore neighbourhood.

The Vehicular and pedestrian access to the proposed site remains unchanged from that granted under Application Ref. 23/60842 and Appeal Ref. ABP-319009-24 via the School House Road which also serves the adjacent Ashfort Residential Development.

It is proposed to provide a vehicular access to the proposed creche via the Golf Links Road. No vehicular access is proposed via the Golf Links Road to serve the residential development. The Golf Links Road will serve the residential development for pedestrians and cyclists only.

2.0 SITE TOPOGRAPHY

Within the subject lands, ground levels predominantly fall in a southerly direction. The site falls across the site from circa 31.46m OD from the north to the southern boundary at an elevation of approximately 22.00m OD.

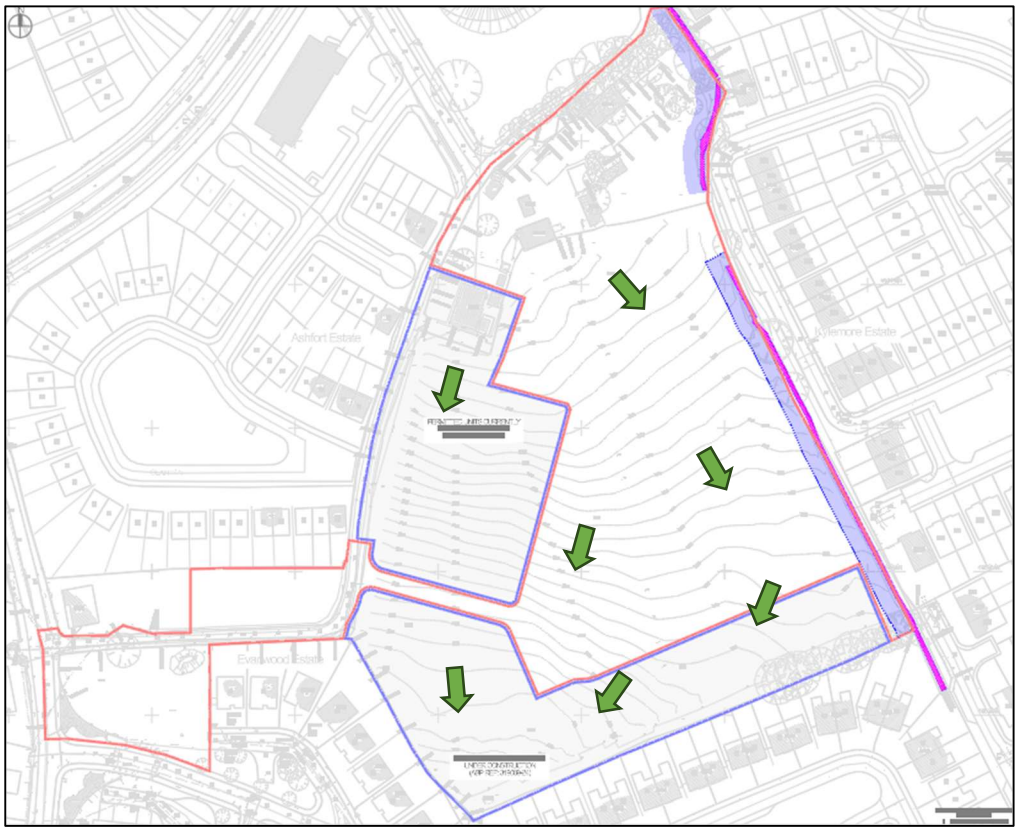

Figure 2: Site Topography

3.0 PROPOSED DEVELOPMENT

As mentioned previously, GLR Property Ltd. intend to apply for planning permission for a proposed residential development at Old Orchard, Monaleen, Limerick, County Limerick on a circa 3.6-hectare site.

There is no formal surface water network within the subject lands. There is however an existing OPW Channel running along the eastern boundary of the subject site.

There is an existing 225mm diameter surface water sewer within the Evanwood Estate to the south of the site.

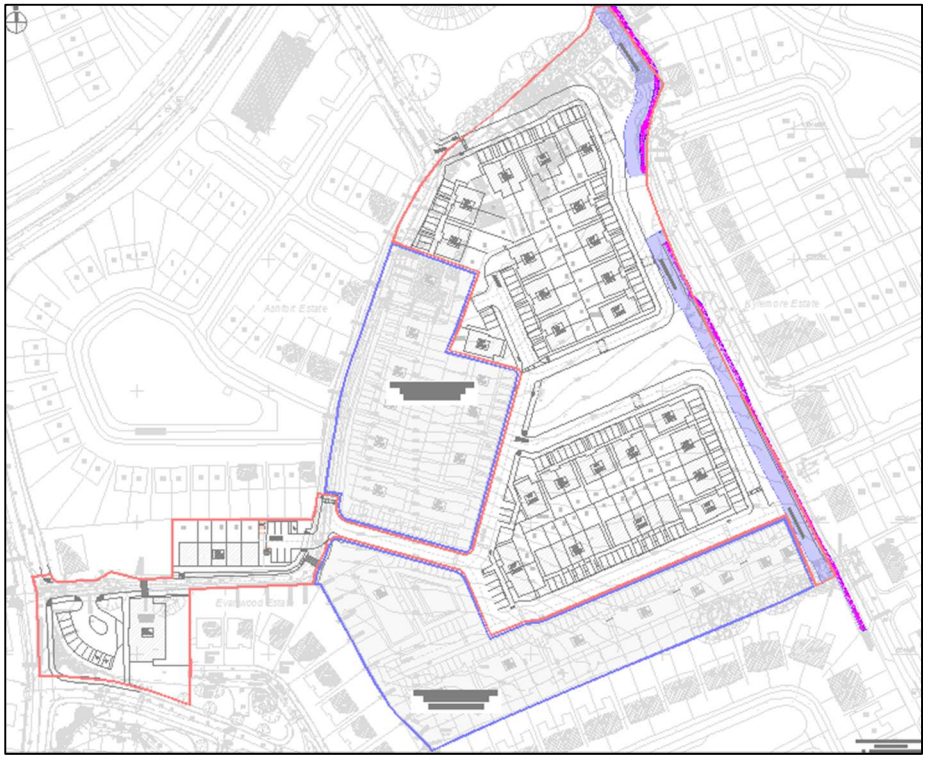

Figure 3: Proposed Site Layout

4.0 PRINCIPLE DESIGN CONSIDERATIONS

During the design of the surface water drainage for the proposed site, including SuDS, the following key documents/standards were taken into consideration.

- 'Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document - Volume 2, New Developments, 2005'
- 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005'
- Limerick City and County Council Surface Water/SuDS Specification 2022
- Limerick City and County Council Surface – Green and Blue Infrastructure Strategy 2021
- Implementation of Urban Nature-based Solutions – Guidance Document for Planners, Developers and Developer Agents, V1.0 November 2024
- CIRIA Design Manuals C753, C697, C644 and C609 have also been consulted to design the surface water drainage system within the site.
- Department of Environment and Local Government - Recommendations for Site Development Works for Housing Areas (1998), Table 3.1.
- IS EN 752:2008 - Drain and Sewer Systems Outside Buildings, Table 2
- Building Regulations (2005) - Section H - Drainage and Wastewater Disposal, Section 1.5.7

5.0 SURFACE WATER DESIGN OVERVIEW

The proposed surface water system has been designed to cater for all surface water runoff from all hardstanding surfaces within the proposed development, including roads, footpaths, roofs, parking areas etc.

It is proposed to use a Sustainable Urban Drainage System (SuDS) approach to stormwater management throughout the site where possible.

All surface water generated within the proposed development will flow via gravity through the proposed surface water network including; petrol interceptors, swales, tree pits, permeable pavers, cellular attenuation systems and detention basins.

The proposed SuDS features will reduce the runoff volume through evaporation, transpiration, infiltration and depression storage of the water within each system.

The proposed development catchment has been subdivided into 6 sub-catchments. A diagram, Figure 4, has been included below to illustrate the surface water network catchment locations, flow routes, attenuation features and controls.

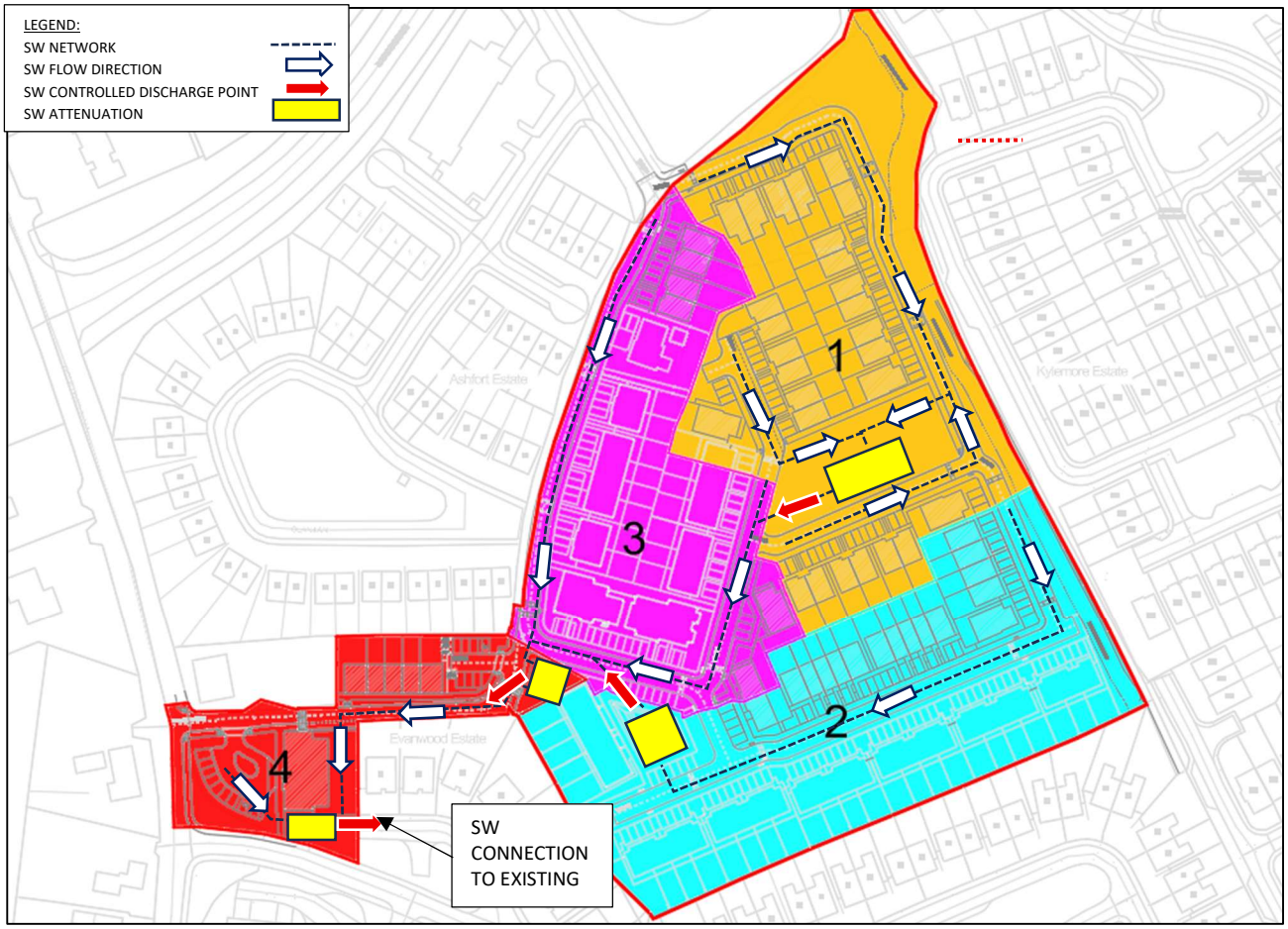

Figure 4: Surface Water Catchments

$QBAR_{rural}$, which is the mean annual flood flow from a rural catchment, was calculated by means of the IH124 method as per GDSDS section 6.6.1. The permissible site discharge for the development ($QBAR_{rural}$) was calculated as 10.2 l/s.

In accordance with Limerick City and County Council's Surface Water/SuDS Specification 2022, site discharge levels should not exceed 2 l/s/ha or Qbar whichever is the greater restriction. Therefore, the allowable discharge for the development was calculated as 7.13 l/s.

The surface water network was assessed for the 5, 30- and 100-year return periods (+30% climate change and +10% Urban Creep) where no flooding from manholes was encountered. The surface water network has been designed for the 5-year return period and assessed for the critical storm to minimise the risk of flooding.

Minimum freeboard of 500mm has been provided for in the design between top of water level during a 100 year (+30% climate change and +10% Urban Creep) event and the proposed building floor levels.

This surface water system has been hydraulically modelled in InfoDrainage to ensure that the overall discharge at the end of the hydraulic system (i.e. the outlets to the existing surface water network) is at, or below, the greenfield runoff rate.

The InfoDrainage Simulation uses the Wallingford Procedure, time/area full hydrograph methodology, including energy and momentum equations for dynamic analysis of surface water networks.

The site drainage network is modelled as one system where all flows, capacities, water levels, surcharged manholes etc are determined throughout the network for each critical storm duration. Therefore, the final combined discharge rate to the existing sewer from the outlet will be kept at (or below) the total permissible discharge rate defined above.

6.0 SUSTAINABLE DRAINAGE STRATEGY

6.1 PROPOSED SUSTAINABLE URBAN DRAINAGE (SUDS) STRATEGY

For the proposed development, a 'SuDS Triangle' was utilised to ensure all three functions are provided for within the Suds Strategy.

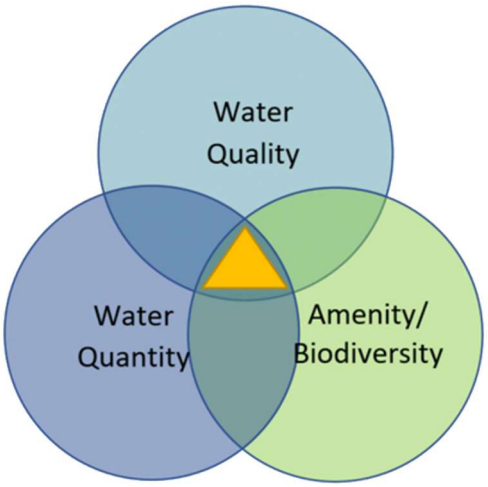

Figure 5: The SuDS Triangle

By considering the three functions of the triangle, a SuDS system will allow for water quality treatment through natural process by;

- Encouraging infiltration (where appropriate) and attenuating peak flows,
- Improving water quality by providing treatment to surface water prior to discharge
- Providing habitat and function where possible for those using the area (including wildlife)

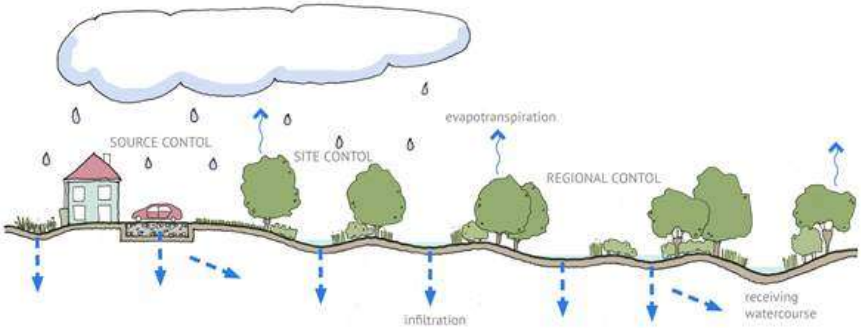

Figure 6: SuDS Treatment Train

The principles of a SuDS Treatment Train were used during the design of the surface water drainage system. The treatment train, as illustrated in the image above, provides an understanding of prevention and source control to reduce surface water run off from the site and improve water quality.

Criterion 1: River Water Quality Protection

Satisfied by providing surface water attenuation tanks and treatment of surface water run off by SuDS features such as full/oil separators at surface water discharge points.

Criterion 2: River Regime Protection

Satisfied by attenuating surface water run-off in association with flow control devices prior to discharge off site at Greenfield runoff rate. Site critical duration storm used to assess attenuation volumes.

Criterion 3: Level of Service (Flooding) for the Site

Satisfied by reviewing available flood hazard information relating to the site's proximity to tidal and fluvial flood plains.

Criterion 4: River Flood Protection

Satisfied by attenuating surface water discharge to greenfield runoff rates, addressing flood risk associated with the 1 in 100-year storm and avoiding development in flood plains. Following a comprehensive review of the design of the storm water drainage system we considered all options under the SuDS guidance policies referred to in the Greater Dublin Drainage Strategy. A preliminary feasibility of the applicable SuDS Techniques was conducted using the facility on the website of Irishsuds.ie (Guidance and Tools).

The preliminary analysis indicated that the following techniques were possibly suitable Attenuation Tanks, Basins, Permeable Paving, Soakaways, Swales and Rainwater Harvesting.

Each proposal was examined and evaluated on its merits / suitability under site specific constraints for use in the proposed development site. Our design approach summary is as follows:

6.2 SUDS APPRAISAL

It is proposed to use a Sustainable Urban Drainage System (SuDS) approach to stormwater management throughout the site where possible.

The overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater, contributing to amenity, aesthetics and biodiversity enhancement and allow for the maximum collection of rainwater for re-use where possible. In addition, SuDS features aim to replicate the natural characteristics of rainfall runoff for any site by providing control of run-off at source and this has been achieved by the current proposals.

SuDS are a requirement under the 'Regional Code of Practice for Drainage Works' and 'The Greater Dublin Strategic Drainage Study'. Additionally, these systems are recommended under the 2009 guidelines, 'The Planning System and Flood Risk Management'.

A number of SuDS features are proposed as part of this development. These have been designed in accordance with CIRIA documents C753, C697 and C609 as follows:

- **Green Blue Roofs:** It is proposed to provide Green Blue Roofs for the proposed apartment buildings included under the current permission as referenced above. These Green Blue Roofs forms part of the overall surface water strategy for the site. There are no additional/further Green Blue Roofs proposed as part of this application. The Green Blue Roofs have been designed taking guidance from the Ciria Publications quoted previously.

  Green Blue Roofs are a type of roofing system that combines the features of both a green roof (vegetated roof) and a blue roof (water retention roof). It is essentially a green roof with added capacity to store and manage

rainwater. The Green Blue Roof will improve water quality, reduce water quantity being discharged from the site, can offer an amenity to residents and offers a biodiversity element to the site also. This addresses the four pillars of SuDS design.

- **Bypass Interceptors:** A proprietary oil/water separator which prevents hazardous chemical and petroleum products from entering watercourses and public sewers. Where deemed appropriate, Class 1 bypass separators have been included and adequately sized as part of the design proposal.

  Bypass separators fully treat all flows generated by rainfall rates of up to 6.3mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of large spillage and heavy rainfall occurring at the same time is small. Class 1 devices are designed to achieve a concentration of less than 5mg/l of oil under the standard test conditions.

  The Petrol Interceptors will be fitted with an alarm/messaging system housed within a kiosk, including vent pipes, all suitably located within the development.

- **Swales:** Broad, shallow drainage channels covered in grass which can treat, convey and attenuate runoff, at source, and can infiltrate to the ground where the subgrade is suitable. Swales also can promote biodiversity.

  Swales are proposed along the development's landscaped paved areas where possible. Surface water runoff from these paved areas, including adjacent roofs where suitable, will discharge to this SuDS feature for interception and treatment prior to entering the drainage network. A high-level overflow to the drainage network within the build-up will accommodate removal of water.

  CIRIA C753 (The SuDS Manual) Table 24.6 notes that pavements drainage by swales can be considered to provide interception.

- **Permeable Pavers:** Porous surfacing (paving block or open graded material) which can treat rainwater, at source, and allow infiltration through to an underlying porous subbase where water can be stored within the voids of the subbase before being slowly released to the drainage collection system through natural flow via the porous medium. In this development, sealedpartial infiltration systems are proposed for those parking spaces that are located an adequate distance away from structures and includes a permeable geotextile at its base as well as an outlet to the surface water system. No infiltration systems are proposed for parking spaces located adjacent to or in close proximity to structures and includes an impermeable liner to capture and detain water.

  These systems will allow some form of storage/attenuation for small rainfall events, allow infiltration for those with permeable geotextile at its base, water evaporation and adsorption in small quantities, therefore there will be less runoff from these areas in small rainfall events thus mimicking the natural response for this catchment. Permeable Pavers are proposed for the public car park areas (e.g. creche, amenity parking) as well as in private driveways.

  They will be connected by means of overflow systems (for partial infiltration systems) and throttled outflow systems (in the case of no infiltration systems) to the development surface water network.

- **Rainwater Harvesting:** In relation to rainwater harvesting, an option is to provide a rainwater butts at each individual dwelling. This could be located to the rear of each unit. This rainwater butt will only have the ability to catch the rear sloping side of the dwelling and the reuse would be for watering plants. The intention would be that these are provided retrospectively by the homeowner.

- **Raised Raingarden Planters:** A raised rain garden planter acts like a small rain garden and makes the area around a downspout more attractive. The raised planter typically has drainage holes in the bottom and overflow holes near the top. The bottom of the planter is filled with a suitable gravel with voids (typically 30-40%) which provides for a small attenuation facility with controlled discharge when full. It is proposed to include raised raingarden planters to the front of dwellings where appropriate

- **Cellular Attenuation System:** Proprietary modular block or arch structure with a maintenance/inspection tunnel for providing underground surface water attenuation storage and can infiltrate run off to the ground where subgrade is suitable. The proposed attenuation system attenuates surface water to restrict the outflow to the equivalent of the existing greenfield runoff. This ensures the development will not give rise to any impact downstream of the site.
- **Basins, wetlands and ponds:** Basins, wetlands and ponds on any site allows safe and contained storage for excess rain and storm water as it allows for its release over time into the sewer system at a controlled rate. This removes much of the potential flooding risk caused by the inability for excess water to drain safely. Furthermore, basins, wetlands and ponds can treat, convey and attenuate runoff, at source, and can infiltrate to the ground where the subgrade is suitable. It can also promote biodiversity.

  It is proposed to incorporate detention basins in green spaces to compliment the SuDs strategy. These are vegetated depressions designed to store runoff on the surface and infiltrate it gradually into the ground. They are dry except in periods of heavy rainfall.

  The detention basins proposed will be located in green areas and will cater for some runoff from adjacent roadways and roofs, but primarily the open space areas where they are situated. The surface water design includes for 2 no detention basins as an initial interception measure, prior to entering the main network, for surface water run off management of some of the sub-catchments within the larger development. The detention basins are proposed to be gradually sloped from 0 level to 300mm deep to merge with the swales.

  CIRIA C753 (The SuDS Manual) Table 24.6 notes that pavements drainage by basins, wetlands and ponds can be considered to provide interception. We confirm that the design has been undertaken with due regard to safety and risk mitigation, in accordance with the principles and best practices set out in the CIRIA SuDS Manual (C753) as well as the 'Implementation of Urban Nature-based Solutions Guidance Document for Planners, Developers and Developer Agents' (November 2024, Version 1) as written and prepared by Civic Engineers and the New Practice for Local Authority Waters Programme.

  The design incorporates features that align with the guidance outlined in Section 36.5 of the CIRIA SuDS manual, which emphasizes the importance of shallow side slopes (not steeper than 1 in 3), appropriate landscaping, controlled access where necessary, and clear visibility to deter unsafe behaviour. These measures ensure the detention basins are safe for all users while still fulfilling their function in surface water management.
- **Flow Control Device:** It is proposed to provide a flow control device at strategic locations within the sub-catchments (described above) to restrict the outflow of water from the subject site. The flow control devices will be fitted with a pull cord bypass and a penstock valve, installed on the inlet to the manhole for maintenance purposes.
- **Existing Ditches, Trees and Hedgerows within the Site:** Within Site where possible, existing ditches, trees and hedgerows are to be maintained. Incorporating these existing drainage features into the proposed overall SuDS strategy would provide for greater storage volume capacity within the site and will assist in the conveyance and treatment of the generated surface water runoff. The retention of existing trees and hedgerows will also assist in the reduction of surface water runoff by evapotranspiration.

Surface water runoff will be treated by means of the measures discussed above prior to entering the below ground attenuation system. A manhole with a 450mm deep sump will be provided to intercept and trap silt/sediment, located upstream of each of the attenuation tanks and attenuation basin.

The proposed SuDS features will reduce the runoff volume through evaporation, transpiration, infiltration and depression storage of the water within each system.

6.3 MANAGEMENT TRAIN

The management train commences with source control through the provision of permeable paving where possible and rain-water butts in the rear gardens. This will also reduce the water consumption required of each housing unit. This employment of these source controls will aid to reduce the peak runoff rate, placing less stress on the facilities downstream.

The second stage of the management train, site control, is provided by the introduction of the hydrocarbon interceptors, detention basins and swales in open areas which provide a degree of treatment before discharging to the attenuation system.

The attenuation tanks offer a third stage of treatment, regional control, by slowing the storm water discharge down and removing additional silts which may remain in the storm water.

6.4 SURFACE WATER SYSTEM

The existing 225mm diameter surface water pipe located within the Evanwoods Estate has been chosen as the suitable surface water discharge point for the proposed development. Surface Water connections remain unchanged as granted under the application referenced previously.

In order to reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site through the use of attenuation facilities.

Control of runoff by means of attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting a flood storage attenuation tank along with restricted outlets as the control devise.

The storage volume required has been designed by means of hydraulic modelling using in the computer aided design package, InfoDrainage.

The attenuation strategy for the site is for the detention of flows in interlinked attenuation tanks. Figure 7 below provides a schematic of the flow and control routes through the catchments.

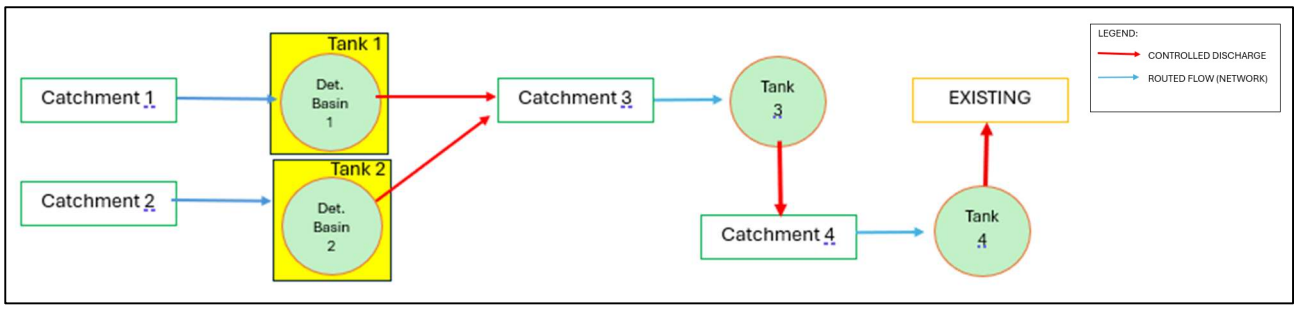

Figure 7: Surface Water Flow and Control Schematic

6.5 SURFACE WATER DRAINAGE NETWORK

Surface water sewers are designed in InfoDrainage using the Modified Rational Method. The surface water pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels and pipe diameters

were entered into the model using the drawings supplied.

6.6 SURFACE WATER DESIGN CRITERIA

The documents listed below was used as reference documents for the design of the surface water management for the proposed development.

- 'Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document - Volume 2, New Developments, 2005'
- 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005'
- Limerick City and County Council Surface Water/SuDS Specification 2022
- Limerick City and County Council Surface – Green and Blue Infrastructure Strategy 2021
- Implementation of Urban Nature-based Solutions – Guidance Document for Planners, Developers and Developer Agents, V1.0 November 2024
- CIRIA Design Manuals C753, C697, C644 and C609 have also been consulted to design the surface water drainage system within the site.
- Department of Environment and Local Government - Recommendations for Site Development Works for Housing Areas (1998), Table 3.1.
- IS EN 752:2008 - Drain and Sewer Systems Outside Buildings, Table 2
- Building Regulations (2005) - Section H - Drainage and Wastewater Disposal, Section 1.5.7

Table 1: Surface Water Drainage Design Parameters

Description	Value
Return Period Target	Hydraulic Pipe Design 1 in 5 years (no surcharging) Network Design 1 in 30 years (no flooding) Network Design 1 in 100 years (no flooding, property protection)
Climate Change	30%
Urban Creep	10%
Freeboard to FFL	500mm
M5-60	14.6 (as per Met Eireann Records)
Ratio R	0.265
SOIL Type	2
Soil Value	0.3
Rainfall Intensity for initial pipe sizing	50 mm/hr
SAAR	1028.7mm
Minimum pipe diameter	225mm (150mm for road gully connections)
Minimum pipe velocities	1.0m/s
Roughness	ks 0.6mm (0.15mm for uPVC)
Minimum Depth	1.2m cover under highways 0.9m elsewhere 0.75m with use of Class Z concrete surround

Flow Reduction parameter	2l/s/ha
Controlled Outflow from Development	7.13 l/s
Flow Restriction Method	Flow Control Device (eg. Hydrobrake)

6.7 STORM WATER OUTFALL

As mentioned previously, It is proposed to service the proposed development by means of a connection to the existing 225mm diameter surface water pipe within Evanwood Estate to the south, as mentioned previously. Surface Water connections remain unchanged as granted under the application referenced previously.

A series of flow control devices withing the development will regulate/control the discharge in order to ensure that the amount of water discharging to the existing network and subsequent waterbodies are kept in accordance with Limerick City and County Council's Surface Water/SuDS Specification 2022. The aforementioned specification requires that site discharge levels should not exceed 2 l/s/ha or Qbar whichever is the greater restriction. Therefore, the allowable discharge for the development was calculated as 7.13 l/s.

All on site surface water attenuation facilities have been sized to cater for all storm water generated within the site boundary of the development.

6.8 SUDS CALCULATIONS

This report should be read in conjunction with the Engineering Services Report, 25066-OSL-00-RP-C-0001, submitted under separate cover as part of the application.

Calculations of the various SuDS elements proposed are contained in the aforementioned Engineering Services Report. Attenuation Tank Sizes and Petrol Interceptor Sizing/Specifications have been included as part of the Stormwater Network Design in this report. The nature-based SuDS principles proposed will have a positive impact from a sustainable impact. Despite this the volumetric capacity of the attenuation system has included the runoff from these areas in its calculations as a design contingency.

7.0 EXISTING SITE HYDROLOGY

A review of Historical Ordinance Survey Ireland information (www.osi.ie) as well as the Environmental Protection Agency (EPA) Maps, was conducted to determine if the OSI 6- inch Maps indicated historic water courses / surface water features within the site.

The subject site is located within the Shannon (Lower)_60 WFD River Sub Basin. The maps indicate existing watercourses to the west (Groody, River Water Body code IE-SH-25S012600) of the subject site. The River Shannon is located approximately 2.7km to the north. These waterbodies are the main hydrological features in close proximity to the site.

There is no formal surface water network within the subject lands.

Figure 8 below illustrates the main hydrological features associated with the area in the vicinity of the site.

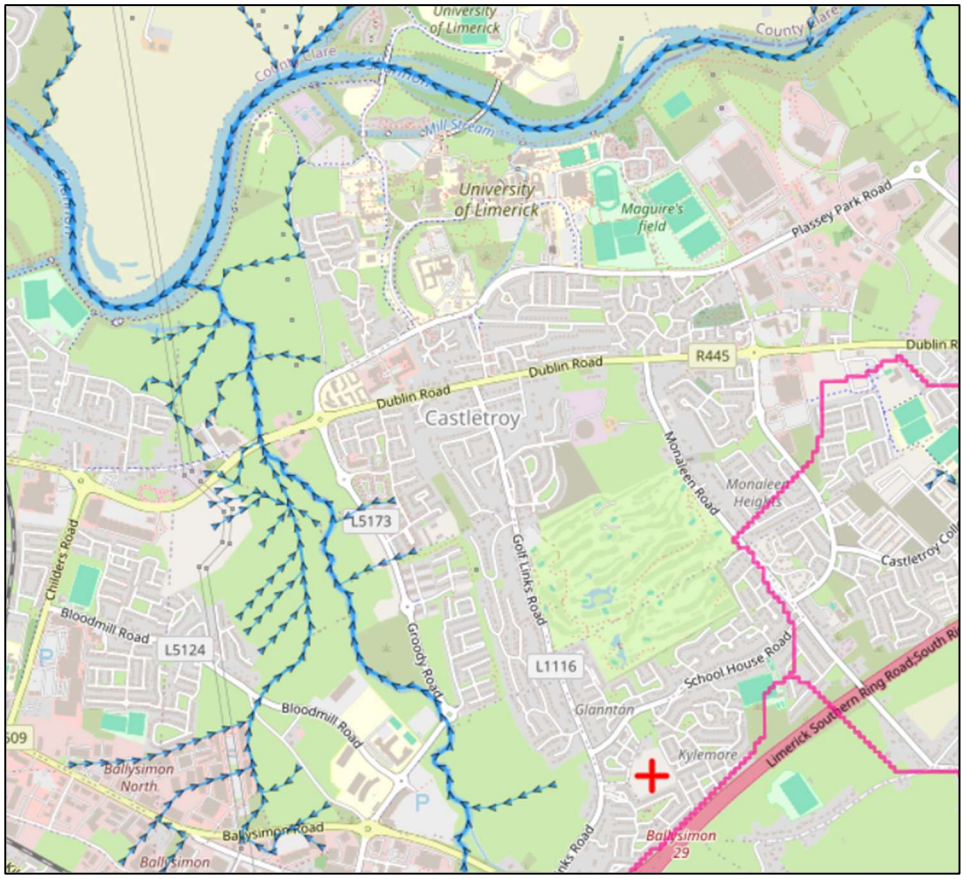

Figure 8: Existing Site Hydrology

8.0 FLOOD & EXCEEDANCE FLOWS

A Site Specific Flood Risk Assessment was prepared by Langan Consulting Engineers (LCE) as part of the original planning application as granted under An Coimsiún Pleanála Reference *ABP 319009-24* (Limerick City and County Council Planning Reference 23/60842).

In summary, the Site Specific Flood Risk Assessment concluded the following in respect of the development as originally proposed under the previous planning;

- Flooding History

  The nearest flood event identified on Floodinfo.ie is located approximately 1km from the subject site. It is not linked to the subject site hydraulically. There is no statutory history of flooding within the site boundaries. Historic OS mapping does not identify any lands within the site boundaries, as being liable to floods. GSI mapping does not identify any alluvial soils within the site. The proposed development lands are not identified on the Arterial Drainage mapping as having benefitted by drainage works carried out historically by the OPW. The OPW PRFA study 2011 did not identify any pluvial or fluvial risk. The OPW CFRAM study 2016 identifies no fluvial risk up to the 1 in 1000-year conditions. Anecdotal evidence suggests localised historic pluvial flooding occurs within the south-western portion of the site during extreme weather events; this can be managed with the proposed stormwater drainage design for the development. The conveyance capacity of the adjacent land drain was assessed. The hydraulic model created confirms that the average capacity of the existing drainage ditch is sufficient to service the 1 in 100-year rainfall event, including a 20% climatic upscale, for the upstream catchment associated with the land drain.

- Site Flood Zoning

  Under the OPW Planning System and Flood Risk Management Guidelines published in November 2009, the proposed development is considered appropriate for this zoning.

- Proposed Development Impact on Flooding

  All site surface water management design should consider the impact of any discharge on flooding elsewhere. The stormwater drainage system for the proposed development should be designed by appropriately qualified and experienced personnel.

- Recommendations

  General maintenance of vegetation in the vicinity of the drain is recommended in order to ensure its working capacity. Surface water run-off from the proposed development must be attenuated to green-field runoff rates within the site, prior to discharge to the adjacent watercourse. All site drainage will be designed in accordance with Sustainable Drainage systems [SuDS] principles.

OSL considers the above referenced Site-Specific Flood Risk Assessment to be relevant, applicable and accurate with respect to the proposed amendments included as part of this planning application.

9.0 MAINTENANCE REGIMES FOR PROPOSED SUDS DEVICES

Table 2 below sets out the proposed maintenance plan and maintenance schedules associated with the proposed surface water infrastructure.

Table 2: Proposed Maintenance Plan and Maintenance Schedule Summary

Item	Inspection Frequency	Inspection Type	Cleaning Mechanism	Cleaning Frequency
Road Gullies	Quarterly or after major storm event	Visual	Remove silt and solids by hand	Minimum every 2 years
Surface Water Manholes	Quarterly or after major storm event	Visual	Open manhole cover. Remove any debris.	Minimum every 2 years
Bypass Interceptor	Every 6 months or in the event of a spill	Visual	Petrol Interceptor to be emptied.	Yearly
Flow Control Device (Hydrobrake)	The aperture is to be checked for obstructions quarterly or after major storm events.	Visual	Remove silt and solids by hand.	Yearly
Green Blue Roofs	Every 6 months	Visual	Inspect all components including soil substrate, vegation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Yearly
Permeable Pavement	Every 3 months	Visual	Brushing and vacuuming	Yearly
Swales	Every 6 months	Visual	Grass cutting.	Monthly during growing season
Attenuation Tanks	To be checked for debris or silt quarterly or after major storm event	Visual	Open inlet and outlet manhole cover. Remove any debris.	Yearly

10.0 CONCLUSION

This Drainage Impact Assessment under the guidelines provided in the Limerick County Development Plan and its associated advice notes, achieves the following outcomes to align with best practices in surface water management:

1. Integration of Nature-based Solutions
   Sustainable Urban Drainage Systems (SuDS): Demonstrate the use of SuDS to manage surface water on-site, prioritizing above-ground solutions such as swales, retention basins, rain gardens, permeable paving, and green roofs.
   Minimizing Hard Engineering: Reduce reliance on hard infrastructure like pipes and tanks by retaining and infiltrating rainwater through natural means.
2. Management of Surface Water Quantity and Quality
   Greenfield Runoff Rates: Ensure that discharge rates from the development are limited to greenfield runoff rates or lower.
   Pollutant Control: Incorporate measures for removing pollutants in compliance with the CIRIA SuDS Manual C753, ensuring water quality improvements before any discharge.
3. Alignment with Climate Change Adaptation
   Design for Climate Resilience: Factor in climate change by increasing rainfall intensities by 30% plus an additional 10% for urban creep, ensuring the drainage systems remain effective under extreme weather conditions
4. Comprehensive Drainage Design
   Detailed Plans: Include full drainage details, drawings, and calculations to provide a clear understanding of the proposed surface water management system.
   Modelling and Analysis: Utilize computer modelling tools like InfoDrainage to simulate storm events and analyze discharge impacts on receiving water systems
5. Addressing Maintenance and Longevity
   Maintenance Plans: Develop a draft long-term maintenance plan that outlines responsibilities, required activities, and access provisions for all SuDS features.
   Sustainability in Practice: Ensure that the design of SuDS considers long-term functionality, access, and integration with surrounding green infrastructure
6. Compliance with Relevant Policies and Standards
   Alignment with the Limerick County Development Plan: Address the policy requirements set out in the Limerick County Development Plan 2022-2028.
   Avoid Direct Discharge: Prohibit direct discharge into watercourses without appropriate attenuation and treatment
7. Holistic Integration with Development Features
   Multifunctional Spaces: Integrate SuDS into green spaces, achieving the four pillars of SuDS (Water Quantity, Water Quality, Amenity, and Biodiversity).
   Phased Development Strategy: For phased projects, implement an overall drainage strategy in the initial phases to ensure seamless functionality as the site develops.

By adhering to these principles, the DIA ensures compliance with the regulatory requirements, minimizes flood risks, enhances environmental sustainability, and supports the broader goals of biodiversity and urban resilience. This approach not only aligns with Limerick City and County Council's guidance but also establishes a forward-thinking framework for managing surface water effectively.