

PROPOSED LARGE SCALE
RESIDENTIAL DEVELOPMENT AT
THE FORMER DELL EMC PREMISES,
INNISHMORE,
BALLINCOLLIG, CORK

DRAINAGE IMPACT ASSESSMENT

DATE 16/02/2026

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Proposed Large Scale Residential Development at the Former DELL EMC premises, Innishmore,
Ballincollig, Cork

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1 Introduction

Denis O'Sullivan & Associates have been engaged as Consulting Engineers for the proposed Large Scale Residential Development (LRD) at the former Dell EMC site in Innishmore, Ballincollig, Co. Cork. This Drainage Impact Assessment has been prepared to support a planning application for the construction of 130 residential units on the subject lands.

The purpose of this report is to assess the impact of the proposed development on the existing stormwater drainage infrastructure and to outline the design approach for managing surface water runoff within the site. The assessment considers the existing site conditions, topography, catchment characteristics, and the proposed surface water drainage strategy, including attenuation, treatment, and controlled discharge measures.

The report demonstrates how surface water runoff will be managed in accordance with national and local planning policy, the Greater Dublin Strategic Drainage Study (GDSDS) guidelines, and best practice in Sustainable Drainage Systems (SuDS). It should be read in conjunction with the planning drawings, site layout, and all other supporting documentation submitted as part of the planning application.

1.1 Site Location

The subject site is located at the former Dell EMC facility in Innishmore, Ballincollig, Cork. It lies within the western suburbs of Cork City, approximately 9 km from the city centre. The site is surrounded by established residential estates, including Westcliffe and Innishmore Court, and is within walking distance of Ballincollig Town Centre, which offers a wide range of retail, educational, recreational, and community services. The area is well served by public transport, with regular bus services operating along the corridor. The site can be accessed via Innishmore Road to the east, as well as the existing entrance off Mechtersadt Road to the southwest. It comprises previously developed lands that are served by existing infrastructure, making it suitable for integration into the surrounding urban context.

A snapshot of the application boundary is outlined in Figure 1.1 below.



Figure 1-1 - Site Location (Google Maps)

1.2 Site Description

The proposed development site comprises the lands formerly occupied by the Dell EMC facility in Innishmore, Ballincollig, Cork. It is a brownfield site, previously developed and currently vacant, with remnants of existing infrastructure and hardstanding areas still present. The site is generally rectangular in shape and is bounded by residential properties to the north and east, with access points from Innishmore Lawn to the east and an existing entrance to the southwest. The topography of the site is relatively flat, with ground levels ranging from approximately 16.14 metres Ordnance Datum (OD) at the southwestern entrance to a low point of 15.50 metres OD towards the northeast corner. The minimal variation in levels supports ease of construction and drainage design. The site is enclosed by mature boundary treatments and benefits from existing connections to public utilities and road infrastructure.



Figure 1-2 - Site Topography

1.3 Site Geology

The site is underlain by made ground, consistent with its previous use as a developed industrial facility. Subsoil conditions are classified as "Made ground" with high permeability characteristics, as indicated by the Subsoil Permeability Code (H). Soil drainage is also noted as "Made," suggesting artificial or disturbed ground conditions. The vulnerability category is classified as "High," reflecting the potential for contaminants to migrate through the subsoil to underlying groundwater.

Hydrogeologically, the site falls under Setting Code 2.m, described as "H Vul: Made ground," with a recharge coefficient of 20% and an average recharge rate of approximately 138.15 mm/year. Effective rainfall in the area is estimated at 690.70 mm/year, with recharge capped at 138.10 mm/year.

The underlying bedrock is part of the Dinantian Mudstones and Sandstones (Cork Group), classified as a Locally Important Aquifer (LI) — bedrock which is moderately productive only in local zones. This geological setting is typical for the Ballincollig area and does not present any significant constraints to development, provided appropriate drainage and foundation design measures are implemented.

1.4 Proposed Development

Castle Peak Properties Ltd intend to apply for planning permission for a Large-Scale Residential Development (LRD) at this c. 1.0 ha site of the former DELL EMC premises, Innishmore, Ballincollig, Cork.

The proposed development will consist of the demolition of the existing former 2 no. storey DELL EMC building (c. 3882 sq m) and ancillary plant area, with associated site clearance works. The proposed development will provide for the 130 no. residential units, arranged in 3 no. blocks in a development ranging in height from 3 to 6 no. storeys.

The development will comprise a mix of 108 no. apartments (total apartment blocks area - c. 10,657 sqm), arranged in 2 no. blocks, providing a unit mix of 52 no. 1-bed and 56 no. 2-bed apartment units. In addition, the proposed development will provide 22 no. duplex units (total duplex block area - c. 2,159 sqm), arranged in 1 no. block, providing a unit mix of 4 no. 1-bed, 9 no. 2-bed, and 9 no. 3 beds.

Vehicular, cyclist and pedestrian access to the proposed development will be via 2 no. entrances from Innishmore Lawn (to the north east) and Mechterstadt Road (to the south west) and the development will include for pedestrian and cyclist permeability. Additionally, pedestrian access points are provided to the west of the subject site and to the south, off Mechterstadt Road.

The development will also include the provision of private, communal and public open space (including all balconies); car parking at ground floor level and undercroft; bicycle parking; internal roads and pathways; bin stores; hard and soft landscaping; boundary treatments; the provision of new surface water and foul drainage pipes and any associated pipe diversion works; retaining walls; changes in level; services provision and related ducting, piping and cabling; electric vehicle charging points; attenuation tanks; SUDS; signage; 1 no. ESB substation; wayfinding structures; public realm works including public lighting; and all site development and excavation works above and below ground. The application contains a statement setting out how the proposal will be consistent with the objectives of the Cork City Development Plan 2022-2028."



Figure 1-4 Proposed Site Layout

1.5 Scope of Assessment

This report deals with the following aspects associated with this development:

- Existing Site
- Storm Water Drainage Design
- Sustainable urban Drainage Systems (SuDS)
- SuDS Maintenance

1.6 Principle Design Considerations

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

- Cork City Council Development Plan
- CIRIA report C753 The SuDS Manual-v6
- Greater Dublin Strategic Drainage Study (GDSDS)
- Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas Water Sensitive Urban Design - Best Practice Interim Guidance Document, (CDP Objective 9.4) - The Department of Housing, Local Government and Heritage.
- Inland Fisheries Irelands Planning for Watercourses in the Urban Area – (CDP Para 11.221)- IFI

2 *Surface Water Design Overview*

The proposed surface water drainage system has been designed to manage runoff from all hard surfaces within the development, including roadways, roofs, footpaths, and parking areas. The completed development will comprise a mix of hard paving, roofing, and soft landscaping, with the site's relatively flat topography forming a single catchment area. Surface water will be collected via a piped network and discharged through one designated outfall point to the existing stormwater network traversing the site.

To ensure compliance with best practice in sustainable drainage and environmental protection, a comprehensive Stormwater Management Plan has been developed. This plan aims to:

- Manage surface water runoff close to source
- Treat runoff on the surface for a range of contaminants
- Minimise sediment remobilisation and impacts from accidental spills
- Enhance biodiversity and local amenity

The surface water drainage strategy incorporates a range of SuDS (Sustainable Drainage Systems) features, including:

- Permeable paving to promote infiltration and reduce surface runoff
- Bio-retention planting areas to treat and filter runoff while supporting biodiversity
- Full retention petrol/oil interceptors to treat runoff from roadways and parking areas
- Green roof to be applied in high density developments
- Attenuation tanks to store excess runoff and regulate discharge rates
- Hydrobrake flow control devices to restrict discharge to greenfield runoff rates (Q-bar)

Surface water runoff from roofs and paved areas will be directed to the piped network via conventional gullies and downpipes. The runoff will then pass through the attenuation and treatment systems before being discharged to the existing Council stormwater asset via a newly constructed surface water manhole. The design ensures that discharge rates are restricted to pre-development (greenfield) levels, thereby mitigating flood risk and protecting downstream infrastructure.

The SuDS features have been designed not only for hydraulic performance but also to contribute positively to the visual character of the development, enhance local amenity, and support ecological value.

2.1 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.

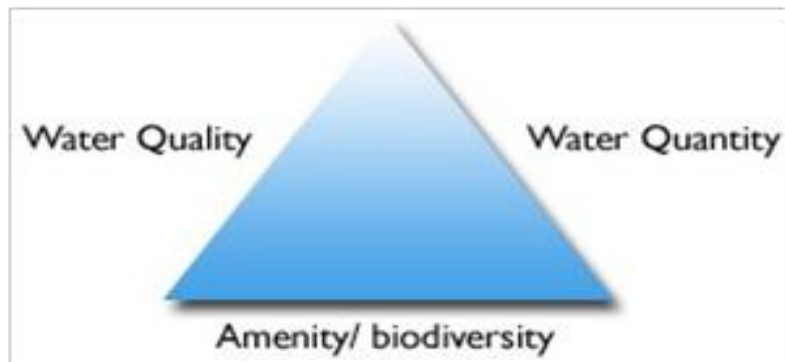


Figure 2.1– SuDS Triangle

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

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

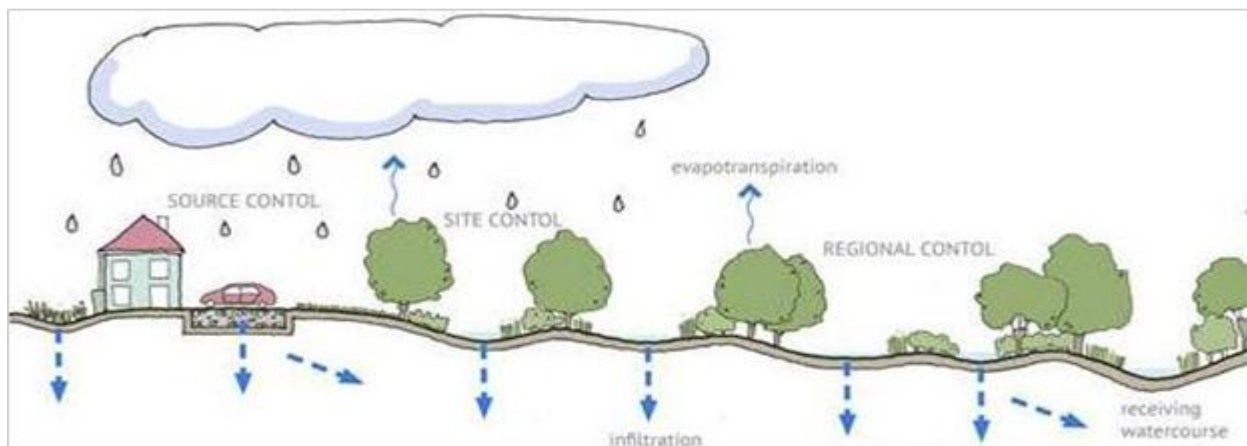


Figure 2.2– SuDS Treatment Train

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 reduced water run-off from a site and improve water quality.

Criterion 1: River Water Quality Protection

Satisfied by providing stormwater attenuation tanks and treatment of surface water run-off by SUDS features such full retention fuel/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 volume.

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 (up to 1 in 100-year flood event).

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 carried out using the facility on the website of Irishsuds.ie (Guidance and Tools). The preliminary analysis indicated that the following techniques were possibly suitable Bioretention Systems, permeable paving and Attenuation Tanks as a last resort.

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:

2.2 SuDS Appraisal

The SUDS selection process used for this site is in accordance with SUDS selection flow chart, Volume 3, Section 6.5, Figure 48 of the GDSDS. The characteristics of the site are utilised to select the various SUDS techniques that would be applicable.

2.2.1 Consideration of SuDS Techniques in Karst Areas

This site is in close proximity to areas which are prone to karstification as they are underlain by Dinantian Pure Unbedded Limestones. This may lead to instability issues within these areas if water is encouraged to infiltrate these areas. Further site investigation is recommended to assess the risk of unstable/karstified subsurface. A number of issues can arise when implementing a SuDS scheme on a site that may be prone to subsurface soil or rock instability. These issues arise mainly due to the effects of SuDS components that encourage water infiltration. Water infiltration into the ground can cause instability in poorly consolidated soils because the water can wash out the soil or cause it to compact. Also, rocks such as the limestone and sandstones found in this area may slowly dissolve over time. Water from infiltration systems can also cause slope or retaining wall failure, because water pressure may increase in the soil behind the slope or wall. SuDS for sites where there are soils or rocks prone to instability should not use infiltration as a runoff destination, and it may be necessary to line systems to prevent any water infiltrating the ground. This will depend on the risks associated with any potential instability and the likely volume of water discharging to the infiltration device when compared to natural exposure to rainfall on the same area. A small amount of infiltration to provide interception may not be a problem. An appropriate risk assessment may need to be carried out on a case by case basis.

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In endeavouring to design a system having regard to the recommendations for SuDS proposal for Residential Developments, the following methodologies are being implemented as part of a SuDS treatment train approach:

- Permeable Pavement - utilised within car parking areas
- Underground Attenuation - below the open space area
- Flow control device (e.g. hydrobrake) - installed at the outfall manhole of each catchment
- Petrol Interceptor - installed downstream of each flow control device manhole.
- Bio-retention planting
- Tree pits

2.2.2 Bioretention Systems/Rain Gardens

Bio-retention planting/raingardens will be constructed 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 will be located at a number of locations around the site and drainage provided to the substrata to ensure runoff is directed to the storm system. This SuDS measure will have ecological and aesthetic benefits.

2.2.3 Permeable Paving

Permeable paving will be incorporated throughout the development to manage surface water runoff at source and reduce the volume entering the piped drainage network. This SuDS feature allows rainwater to infiltrate through the paving surface into a specially designed sub-base, where it is temporarily stored before gradually discharging into the underlying soil or drainage system. The use of permeable paving in driveways, footpaths, and parking areas helps to mimic natural drainage processes, reduce peak flow rates, and improve water quality by filtering out suspended solids and pollutants. Its inclusion supports compliance with the Greater Dublin Strategic Drainage Study (GSDSDS) guidelines and contributes to the overall sustainability and resilience of the site's stormwater management strategy.

2.2.4 Tree Pits

Tree pits with integrated drainage functions will be installed as part of the site's landscaping and surface water management plan. These features serve a dual purpose: enhancing the visual and ecological value of the development while also contributing to stormwater attenuation and treatment. Designed to receive runoff from adjacent paved areas, tree pits allow water to infiltrate into the surrounding soil, where it is absorbed by vegetation and filtered naturally. The pits are constructed with engineered soil and sub-base layers to promote infiltration and prevent compaction, ensuring long-term functionality. Tree pits also support biodiversity and urban cooling, aligning with SuDS principles and the objectives of the site's Stormwater Management Plan.

2.2.5 Green /blue roof

Green / Sedum roofs involve covering a roof of a building with vegetation laid over a drainage & storage layer and a waterproofing membrane. They are designed to intercept and store rainwater and therefore, reduce surface water runoff. They are suited to the flat type of roof being proposed for the proposed apartment buildings. Sedum roofs have ecological and aesthetic benefits and remove pollutants from rainwater.

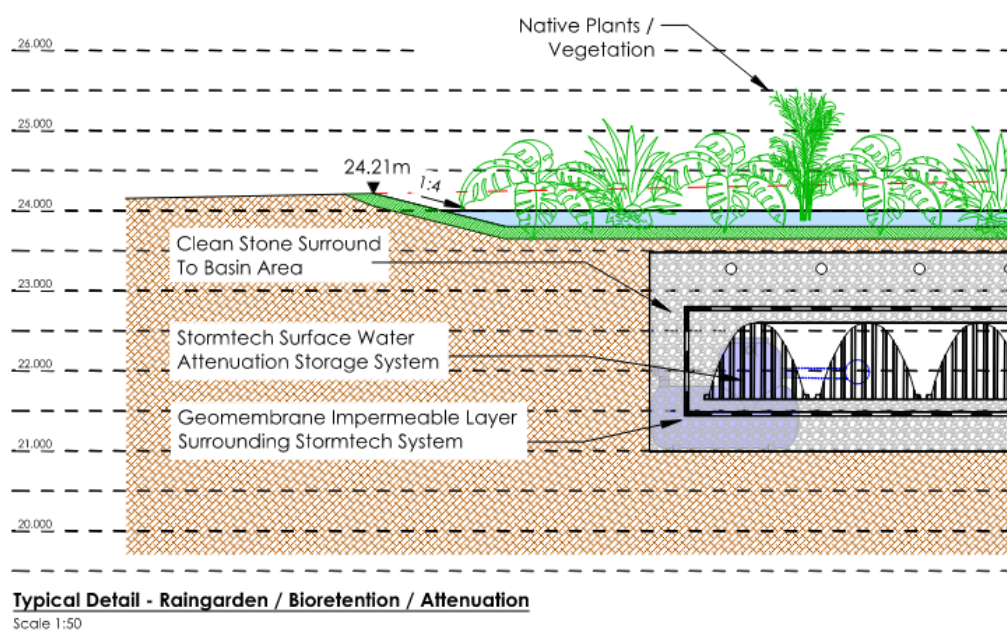
It is proposed to provide blue/ green roofs to the apartment building in the development. Attenuation specific to these areas will be provided on the roof. The provision of same has facilitated the reduction in the volumetric requirements of the overall attenuation required.

Apartment	Roof Area	Storage Depth Required	Attenuation Volume provided
Block 01	185m ²	52mm	9 m ³
Total	185m ²	52mm	9 m ³

The net result of providing blue roofs is that there is a reduction in required runoff to be attenuated. However this has been ignored in the calculation of attenuation. Also of note is that these SuDS elements will be located in areas that will be contained in Management Companies and will not be required to be taken in charge by Cork City Council.

2.2.6 Attenuation Tanks

The proposed attenuation system attenuates surface water to restrict the outflow to the equivalent of the 1 in 1 ye runoff . This ensures the development will not give rise to any impact downstream of the site. The system will be used under the large open spaces within the development. The proposed system will have adequate soil cover so that appropriate landscaping can be planted and play equipment installed in these open spaces.



2.2.7 Flow Control Device

It is proposed to provide a hydrobrake, or similar approved, at the outfall of the surface water catchment to restrict the outflow of water from the subject site. The hydro-brakes will be fitted with a pull cord bypass and a penstock valve installed on the inlet to the manhole for maintenance purposes. The restricted outlet will be designed to the 1 in 1 year greenfield runoff rate.

Tank Ref	Restricted Outlet
1	2.7l/s

2.2.8 Petrol Interceptor

It is proposed to provide a petrol interceptor upstream of the attenuation area to ensure that any remaining hydro-carbons or pollutants within the runoff from trafficked areas are treated prior to outfall to the drainage network. It is proposed to provide a Kingspan Bypass Separator Types or similar approved.

In conclusion the water quality from this catchment should be of a high quality due to the above-mentioned measures, which are applied in a treatment train to treat the water before discharge at a restricted rate to the local network.

The above measures ensure a suitable management train is provided.

2.2.9 Existing Ditches, Trees and Hedgerows Within Site

There are no existing ditches on the site.

2.3 Management Train

The management train commences with source control through the provision of bio-retention systems, tree pits and permeable paving. The 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, silt control, is provided by the introduction of the hydrocarbon interceptors and silt traps which provide a degree of treatment before discharging to the attenuation system.

The attenuation area 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.

2.4 Surface Water System

The existing stormwater network traversing the site has been chosen as the suitable surface water discharge point for the proposed development.

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 network. 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 by the usage of attenuation storage.

Control of runoff by 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 using the computer aided design package InfoDrainage.

The attenuation strategy for the site is for the detention of flows in interlinked attenuation tanks.

2.5 Surface Water Drainage Network

The surface water drainage network for the proposed development was modelled using the Autodesk InfoDrainage software application. 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.

2.6 Design Criteria:

The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

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- Return period for pipe work design 2 years
- Return period for attenuation design 100 years
- Soil Type 3
- Allowable Outflow 1 in 1 year greenfield 2.7 l/second
- Time of entry 5 minutes
- M5 – 60 18.8 mm
- Ratio “r” 0.25
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity (based on pipe flowing full) 1.0 m/s
- Rainfall Runoff from Roads and Footpaths 100%
- Rainfall Runoff from Roofs 80%
- Rainfall Runoff from Driveways 80%
- Rainfall Runoff from Green Areas 20%
- Rainfall Depth Factored for Climate Change (as per GDSDS) 20%

(in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

The global variables required for the model were the M5-60 and Rainfall Ratio. These two factors may be read from maps contained in the Wallingford procedure. They enable the program to calculate the intensity, duration and frequency characteristics of storms.

M5-60 is the rainfall depth based on a 60-minute storm of 5 years return period. Ratio R is the ratio of the 60-minute storm to the 2-day storm for the 5-year return period events. These values are as follows:

- M5-60 = 18.8mm
- Ratio R = 0.25

InfoDrainage generates design storms using the principles set out in the Flood Studies Report (NERC 1975).

A summer rainfall profile was used for the design of the pipework and a winter rainfall profile was used for the design of the storm water attenuation to give the critical design. A summer profile gives higher rainfall intensities and results in higher runoff rates and is used to determine the required capacity of the pipework. A winter rainfall profile gives a flatter more sustained profile

and results in higher runoff volumes and is used to determine the attenuation/storage requirements.

The surface water drainage network was assessed for compliance with maximum and minimum velocities, pipe length etc. The network was designed to ensure velocities in the network and pipe gradients did not exceed the maximum velocity of 3.0m/s. The minimum velocity allowed was 0.75m/s.

The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each return period analysed as follows:

1 in 2-year return period events were used to ensure that the system did not surcharge;

1 in 100 year return period events were used to ensure that flooding did not occur.

The layout of the proposed storm water network is shown on the Proposed Stormwater & Foul Sewer Layout Plan Drawing No. 6709-0020.

2.7 Storm Water Outfall

Storm water from the proposed development shall discharge to the existing Council stormwater asset via a newly constructed surface water manhole which traverses the site via a hydro brake manhole, which will limit the amount of water discharging to the network. The amount of water discharged from the hydro brake manhole will be determined by using the allowable Greenfield Runoff rate for the developable area of the site. It is to be noted that all on site storm water storage facilities have been sized to cater for all storm water generated within the site boundary of the development.

3 Soil Infiltration Rate

Whilst a ground investigation is pending for this proposed development, DOSA Consulting Engineers previously had undertaken site investigation works, in the form of trial hole excavations and soil infiltration assessment in the neighbouring approved Part 8 development to the north. One pit was excavated on site.

DOSA undertook site investigation works, in the form of trial hole excavation, on the 2nd of December 2024.

A mechanical excavator was used to excavate the soakage trial pit to a depth of 2.0m. the pit was 1.8m long and 1.0m wide. As the invert level of the proposed stormwater suds measures was assumed to be 0.8m, the pit was filled to a depth below this of 1200mm and allowed to drain to near empty. The water level from filling was recorded at intervals sufficiently close to clearly define water level versus time. The soil infiltration rate was calculated from the time taken for the water level to fall from 75% to 25% of the effective depth of the pits.

$$\text{Soil Infiltration Rate } f = \frac{V_{p75-25}}{A_{p50} \times t_{p75-25}}$$

Where V_{p75-25} equates to the effective storage volume of water in the trial pit between 75% and 25% effective depth.

A_{p50} the internal surface area of the trial pit and up to 50% effective depth.

t_{p75-25} the time for the water level to fall from 75% to 25% effective depth.

Calculating Soil Infiltration Rate

It was proposed that the invert of the discharge drain will be approximately 0.8m below ground surface. When trimmed and clean the trial pit was 2.0m deep, 2.70m long and 1.20m wide. As the depth of the soakpit was 2000mm, this gave an effective storage depth of 1200mm.

Volume outflowing between 75% and 25% effective depth:

$$V_{p75-25} = 2.70 \times 1.20 \times (0.90 - 0.30) = 1.94\text{m}^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides of 50% effective depth and including the base of the pit.

$$A_{p75-25} = (2.70 \times 0.6 \times 2) + (1.20 \times 0.6 \times 2) + (2.70 \times 1.20) = 7.92\text{m}^2$$

The time for the outflow between 75% and 25% effective depth:

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tp75-25 (maximum) = 154 minutes

$$\text{Soil Infiltration Rate, } f = \frac{1.94}{7.92 \times 154.0 \times 60} = 2.65 \times 10^{-5} \text{ m/second}$$

4 Maintenance Regime for SuDS Devices

The SuDS features proposed above for the site will require the following maintenance:

4.1 Underground attenuation systems

Gullies, pipework and silt traps within the development boundary are to be maintained by the Management Company upon completion of the works. It is suggested that the gullies and associated pipework and silt traps are inspected monthly for the first six months post-handover, with a maintenance plan being compiled based on the findings of these observations. The Management Company will commit to ensuring regular checks of the network to ensure any siltation is noted and removed by vacuum tanker or other method.

The Attenuation Tank is to be maintained by the Management Company upon completion of the works. A maintenance schedule is to be developed based on Table 21.3 of CIRIA C753 SUDS Manual, 2015, transcribed below. Additionally, the operation and maintenance shall be undertaken following the guidelines present on Chapter 21 of the CIRIA SUDS Manual 2015. Routine attenuation tank maintenance will only be carried out during dry periods. Maintenance for the attenuation tank will be conducted using a vacuum/JetVac vehicle. The JetVac process involves using a high-pressure water nozzle to flush sediment back into the manhole for vacuum extraction. Prior to the arrival of the JetVac vehicle, the tank will be jetted in preparation for the jetvac vehicle. To ensure efficient workflow, a traffic management plan will be implemented to allow the tanker to be stationed adjacent to the development for vacuum extraction.

The maintenance process will involve pre-jetting the tank with the assistance of bank men while the JetVac vehicle is on-site. This approach, along with scheduling the works during off-peak traffic hours, will ensure that the maintenance is carried out safely and effectively to minimize disruption.

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Figure 3 Extract from CIRIA C753 SuDs Manual 2015

4.2 Bio-retention Systems/Tree Pits

Maintenance of the planting will be greatest in the first few years, which will include regular inspection of plant condition including inlets and outlets, removal of invasive vegetation and possibly irrigation during long dry periods.

4.3 Permeable Paving

To ensure the long-term effectiveness of the permeable paving system, a structured maintenance regime will be implemented throughout the lifecycle of the development. Routine inspections will be carried out to identify and address any surface clogging caused by sediment, organic matter, or debris. Sweeping or vacuuming of the paved areas will be undertaken at regular intervals—typically twice annually—to maintain permeability and prevent surface runoff bypassing the system. In addition, periodic jetting of the sub-base may be required to restore infiltration capacity if signs of reduced performance are observed. During construction, protective measures will be put in place to prevent contamination of the paving system by silt or construction materials. The maintenance regime will be documented and incorporated into the site's overall SuDS management plan to ensure compliance with best practice and local authority requirements.

4.3.1 Tree Pits

Maintenance of trees will be greatest in the first few years, which will include regular inspection of tree condition including inlets and outlets, removal of invasive vegetation and possibly irrigation during long dry periods. As any handover process (taking in charge) is medium to long term it is anticipated that the Tree Pit regime will be well established and operational with little maintenance required.

4.3.2 Blue /Green Roof Maintenance

With the right conditions, green roofs are self-regulating but a minimum of two inspections per year should be conducted.

A typical maintenance programme includes:

- 1) Roof Evaluation - a comprehensive review of your green roof to determine what remedial work, if any, needs to be done.
- 2) Removal of Unwanted Items - Over time a green roof can become congested with leaves, debris, and other unwanted vegetation, which can be removed as part of the service.
- 3) Inspection - of roof outlets and removal of any encroaching vegetation to enable water to flow freely through rainwater pipes.
- 4) Application of fertiliser - To help restore your green roof to its best, an organic slow-release granular fertiliser if required will encourage growth.

Green Roofs are only proposed in private curtilage. As a result, its maintenance will be the responsibility of a management company and not that of the council. Safe working procedures in relation to the maintenance of these roofs post construction will be detailed in Risk Assessments and associated method statements and included in any as-built package and hand over documentation at taking in charge stage.

4.4 Flow Control Manhole:

Normally little maintenance is required as there are no moving parts within a vortex control, however, after installation, flow controls should be inspected to ensure the orifice is not blocked on a monthly basis for three months and thereafter at six monthly intervals and hosed down if required. Remove rubbish or debris from flow control if present. Typically flow controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

4.5 Petrol Interceptor:

Systems should be visually inspected for every rainfall event for 30 days after installation and the amount of sediment measured to give the operator an idea of the expected rate of deposition. Systems should then be inspected every 6 months to verify the appropriate level of maintenance. Floating debris and solids should be removed and the sump cleaned with a conventional sump vacuum cleaner. Filter media should be replaced and sediments, oils and grease should be removed where required.