

Outline Civil & Structural Report

Residential Development, Blackrock Avenue, Cork

Prepared for: John Sisk and Sons
Prepared by: MMOS Consulting Engineers
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Revision	Date	Issue	Author	Checked
P01	09.09.25	FIRST ISSUE	WOS	PM
P02	12.02.26	SECOND ISSUE	WOS	PM
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P06	25.05.26	SIXTH ISSUE	WOS	PM
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1.0 INTRODUCTION

MMOS Consulting Engineers were employed by John Sisk and Sons as the civil and structural engineers for the proposed residential development at Blackrock Avenue, Cork. The proposed new development consists of 114 units across two buildings. Block A has 50 units and Block B has 64 units. The proposed development varies in height from three to five storeys over ground floor.

The site is a greenfield site located on Blackrock Avenue, Cork. The site location is delineated with a red outline in Figure 1 below.



Figure 1 – Site Location

2.0 PROPOSED NEW SUPERSTRUCTURE

2.1 LOADING AND DESIGN

The proposed structural loading taken on the structure is presented in the table below.

AREA LOAD DATA SHEET			
	Item	Dead Load	Live Load
Internal floor	200mm Precast Slab	3	
	75mm Screed	1.8	
	Partitions		1
	Ceiling and services	0.15	
	Live load		2
	Total		4.95
			kN/m ²
Green Sedum Roof	200mm Precast Slab	3	
	75mm Screed	1.8	
	Sedum Roof	1.5	
	Ceiling and services	0.15	
	Live load		3
	Total		6.45
			kN/m ²
Private Terrace	200mm Precast Slab	3	
	75mm Screed	1.8	
	Paving	0.8	
	Waterproofing	0.5	
	Ceiling and services	0.15	
	Live load		3
Total		6.25	3
			kN/m ²
Roof with PV Cells	200mm Precast Slab	3	
	75mm Screed	1.8	
	Photovoltaic panels	0.125	
	Waterproofing	0.5	
	Ceiling and services	0.15	
	Live load		3
Total		5.575	3
			kN/m ²
	Cladding	10	
			kN/m
	200mm Precast wall	5	
			kN/m ²

The building is being designed and constructed in accordance with the following codes of practice, their associated Irish Annex where applicable and all relevant Irish building regulations and technical Guidance Documents.

Design Loading

EN1990 Basis of Structural Design
EN 1991 Actions on Structures
EN 1997 Geotechnical Design

Site Works

BS 5225 Code of Practice for Noise & Vibration Control on Construction and Open Sites.
BS 5228 Control of Noise and Vibration on Open Sites.
BS 6472 Evaluation of Human Exposure to Vibration in Buildings.
BS 6187 Code of Practice for Demolition.
BS EN 5606 Guide to Accuracy in Building
BS 8000 Workmanship on Building Sites.

Reinforced Concrete

EN 1992 Design of Concrete Structures (All Parts).
EN 197-1 Cement.
EN 12620 Aggregates for Concrete EN 1008 Mixing Water for Concrete
I.S. EN 206-1 Concrete Specification, Performance, Production and Conformity.
BS 4449 Specification for Carbon Steel Bars for the Reinforcement of Concrete.
BS 4482 Specification for Cold reduced Steel Wire for the Reinforcement of Concrete.
BS 4483 Steel Fabric for the Reinforcement of Concrete.
SCI P354 Design of Floors for Vibration.

Precast Concrete

EN 1992 Design of Concrete Structures (All Parts)
EN 1168 Precast concrete products - Hollow core slabs
EN 13747 Precast concrete products - floor plates and floor systems

Structural Steelwork

EN 1993 Design of Steel Structures (All Parts).
EN 1090 Execution of steel structures – Technical requirements.
EN 1461 Hot dip galvanized coatings on fabricated iron and steel articles – specifications and test Methods.
EN ISO 2808 Paints and varnishes. Determination of film thickness.

Masonry

EN 1990 Basis of Structural Design
EN 1991 Actions on Structures
EN 1996 Design of Masonry Structures

Fire Engineering

Building Regs Technical Guidance Document B

BS5588: P11 Code of Practice for Shops, Offices, Industrial Storage and other similar Buildings

BRE No 187: External Fire Spread: Building Separation and Boundary Distances

Drain & Sewer Systems

BS EN752 Drain & Sewer Systems Outside Buildings

BS EN 12056 Gravity Drainage Systems Inside Buildings

BS 8301 Code of Practice for Building Drainage

BS EN 124 Manhole Covers and Frames

BS EN 12056 Gravity Drainage Systems Inside buildings

I.S EN 424 uPVC Pipes and Fittings for Buried Drainage and Sewage Systems.

The building is to be constructed to tolerances as set out in accordance with BS5606 – ‘Guide to Accuracy in Building’.

In accordance with the Building Control Regulation 2014 “Code of Practice for the Inspection & Certifying Building and Works” the building works will require the implementation of the Assigned Certifier Procedures (BCAR) and submission of Commencement Notice to the Building Control Authority between 14 and 28 days prior to commencement of construction works on site.

2.2 VERTICAL STRUCTURE

It is proposed to construct the new superstructure in precast concrete. Figure 2 below shows a typical structural floor plan. The red lines indicate structural walls, and the blue lines indicate steel beams. It is proposed to use 200mm thick precast concrete walls for the vertical support structure. The 200mm thick walls will be suitable for a fire resistance of up to 90mins under normal loading conditions.

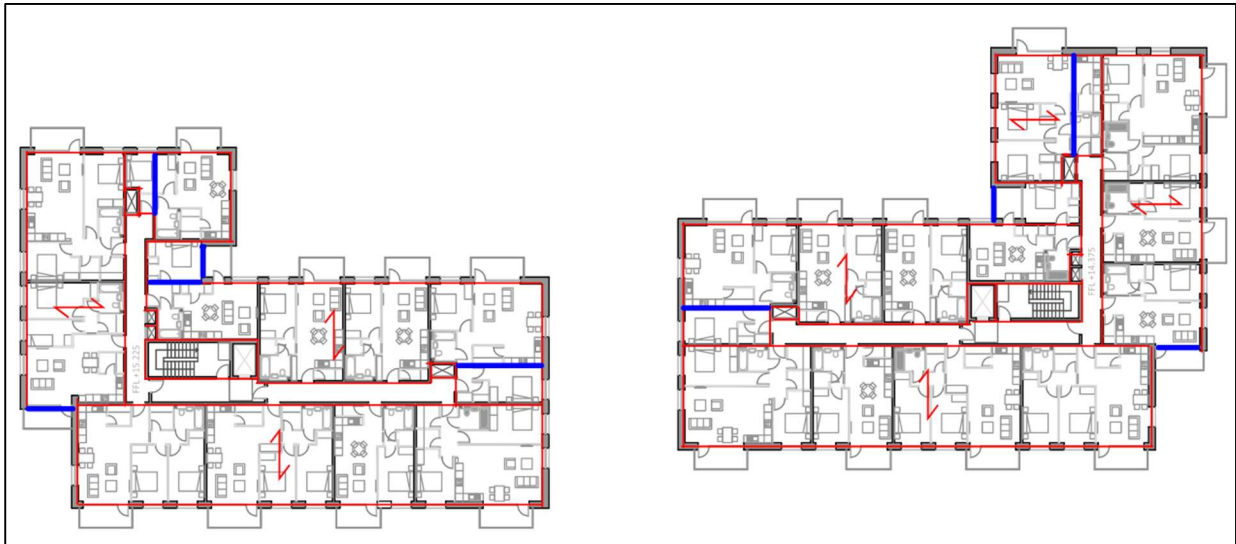


Figure 2 – Typical Structural Floor Plan

2.3 FLOORS

The floors are proposed to be 200mm precast hollowcore floor planks with a 75mm structural screed. The structural screed will have a reinforcing steel mesh and tie bars to satisfy robustness criteria for horizontal and vertical ties. The structural screed will act as a horizontal diaphragm to transfer lateral forces to the concrete shear cores.

There will be locations where walls cannot be accommodated for architectural reasons. It is proposed to use either precast concrete beams or steel beams in these locations. Figure 3 and Figure 5 show the proposed typical details for both beam types.

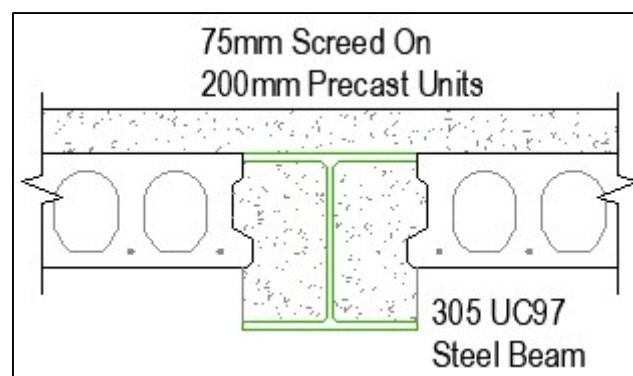


Figure 3 – Typical Steel Beam Detail

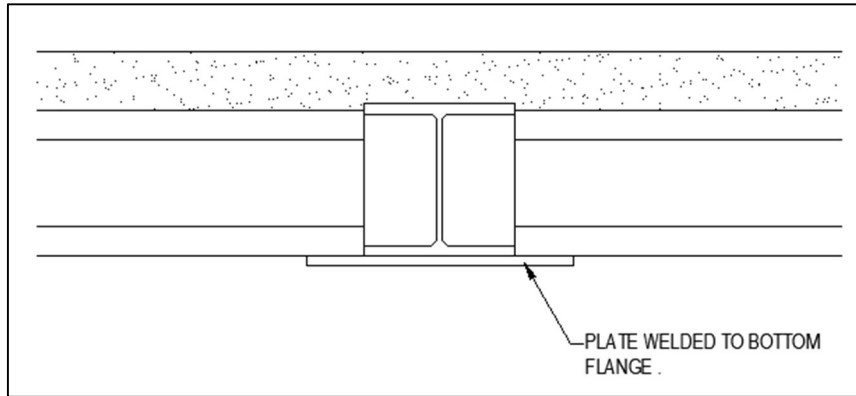


Figure 4 – Typical Steel Beam Detail 2

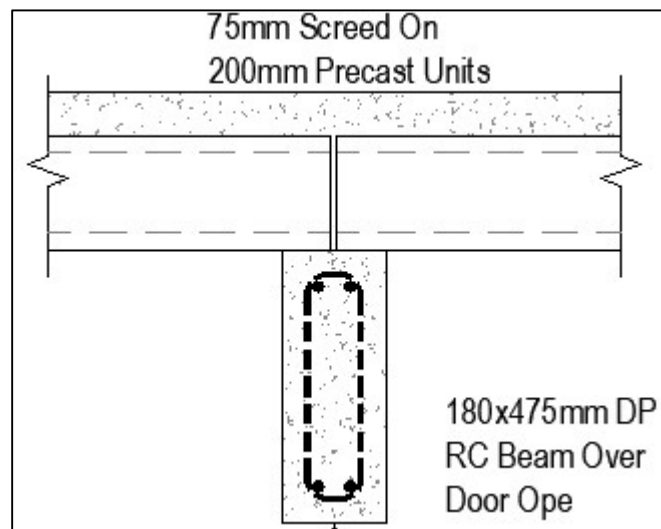


Figure 5 – Typical RC Beam Detail

The support for the setback level will require steel beams to support the walls over. This is illustrated in Figure 6 below.



Figure 6 – Set Back Level Support

2.4 BALCONIES

It is proposed to form the balconies with glide on Sapphire aluminium balconies. Figure 7 below shows the typical balcony connection detail.

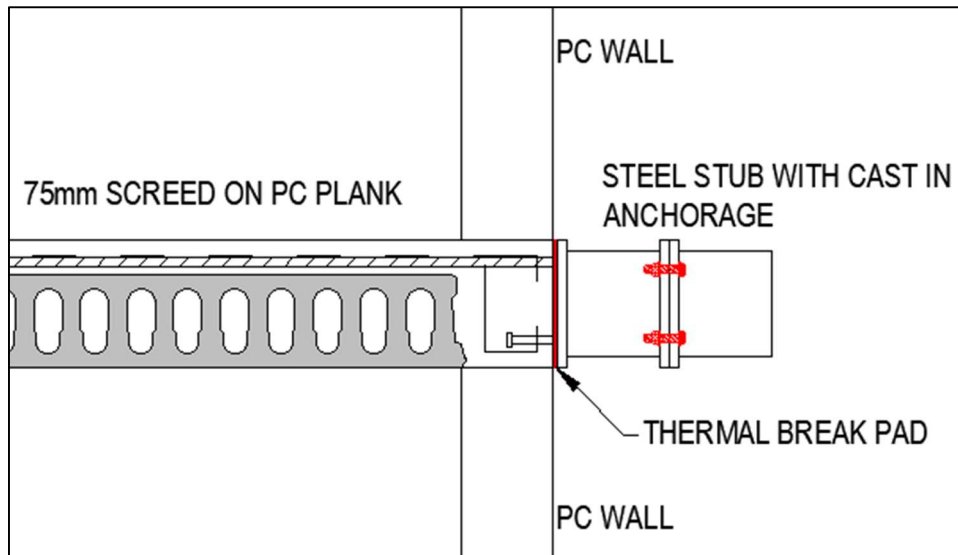


Figure 7 – Typical Balcony Connection Detail

2.5 LIFT PIT

It is proposed to have an insitu concrete lift pit. Waterproofing will be in the form of a White Tank system to achieve a Grade B basement. Please refer to the detail below.

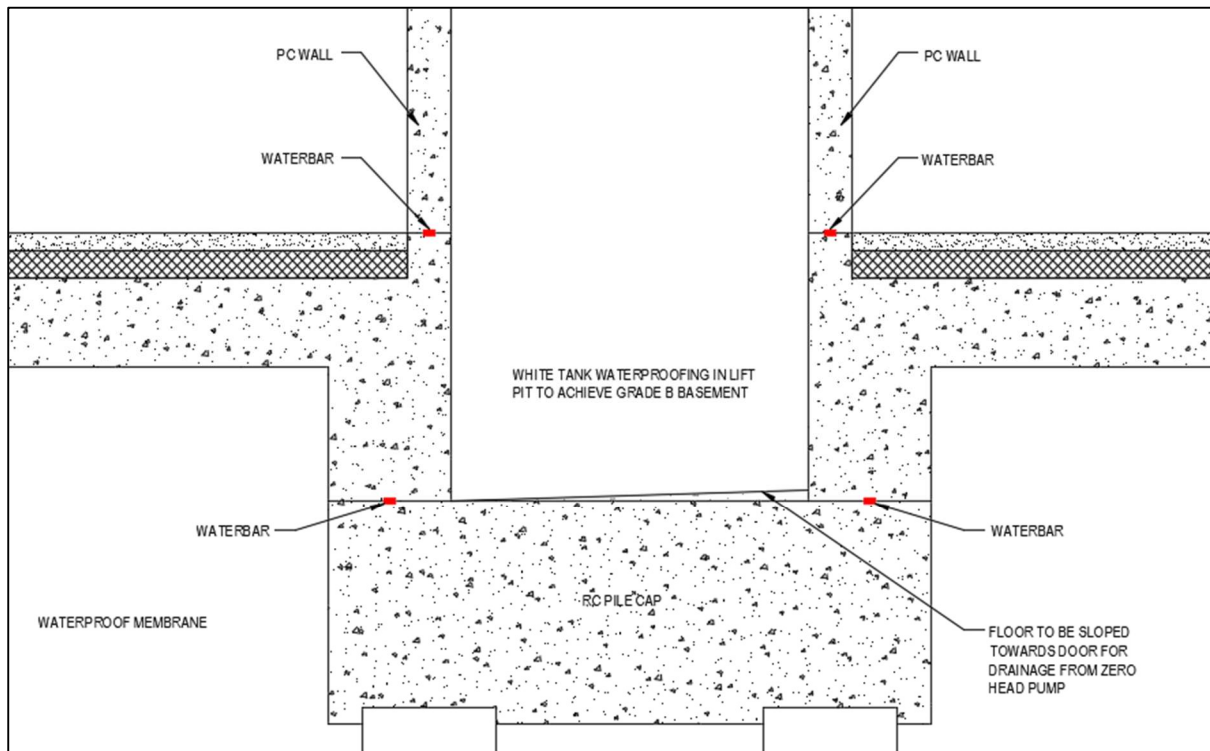


Figure 8 – Lift Pit Detail

2.6 RELIEVING ANGLES

There will be a requirement for relieving angles on every second floor to support the masonry façade and provide a horizontal movement joint. A typical detail is shown below.

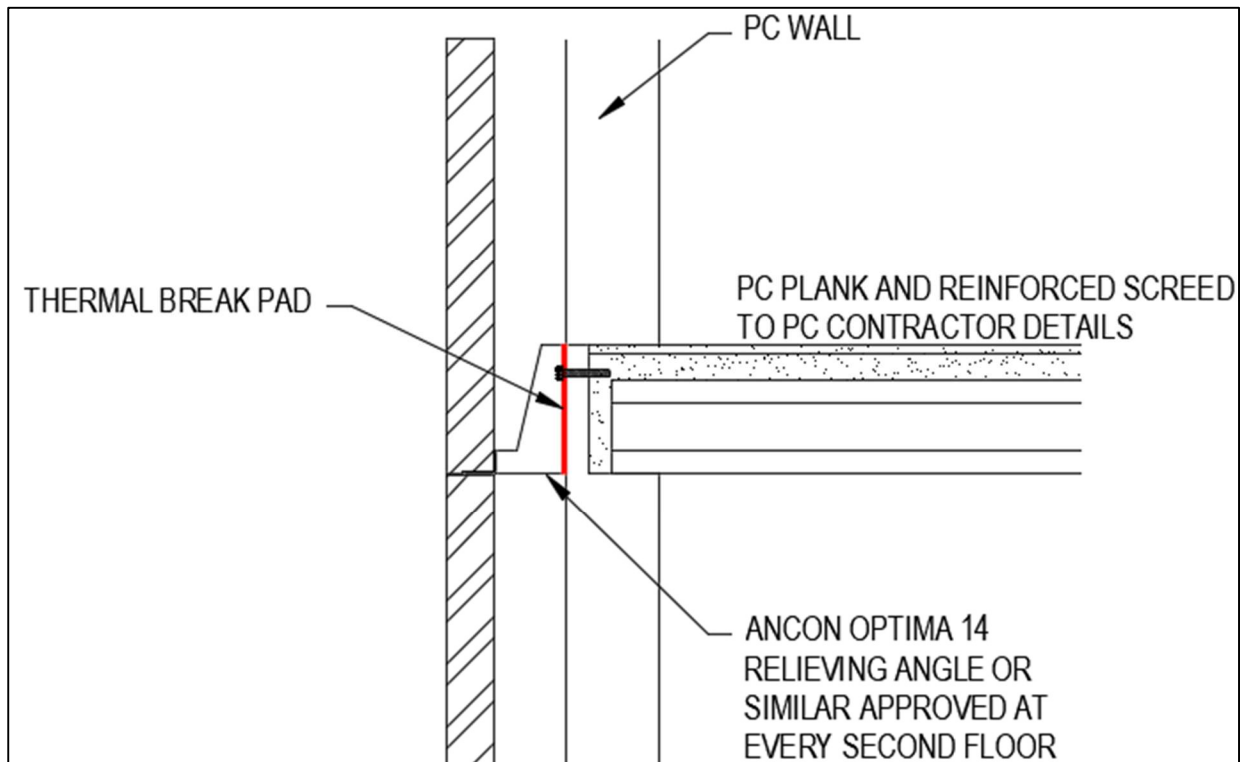


Figure 9 – Masonry Relieving Angle

2.7 FOUNDATIONS

The proposed foundations will be a series of piles and ground beams. The proposed layout is presented in Figure 10 below. The piles will be 600mm diameter CFA piles. There is currently no site investigation available. However, it can be assumed that the piles will be at least 15m deep to support a building of this size. The main ground beams will be circa 900x1000mm dp and the tie beams will be 450x450mm dp. The ground floor slab can be either insitu concrete or precast concrete.

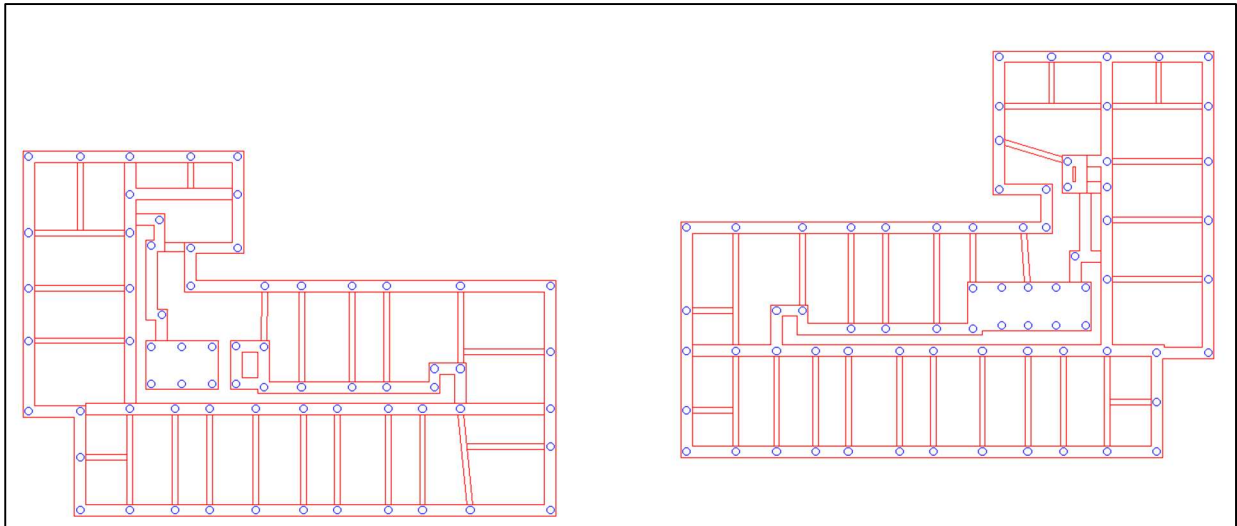


Figure 10 – Foundation Layout

2.8 SERVICE ROUTING

The foundations will be dropped to allow for the routing of services above the foundations. Please see typical details below for dropped foundations.

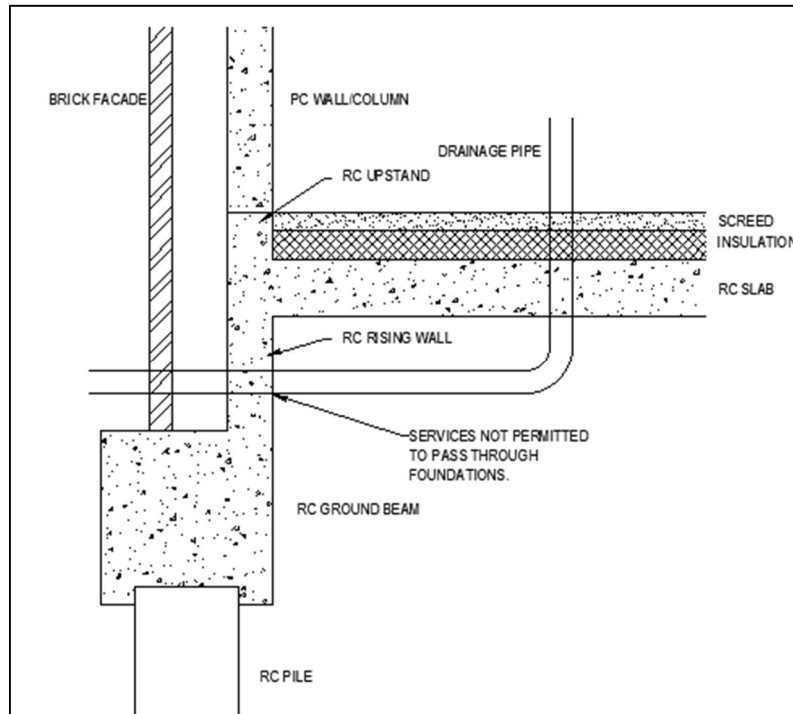


Figure 11 – Dropped Edge Beam

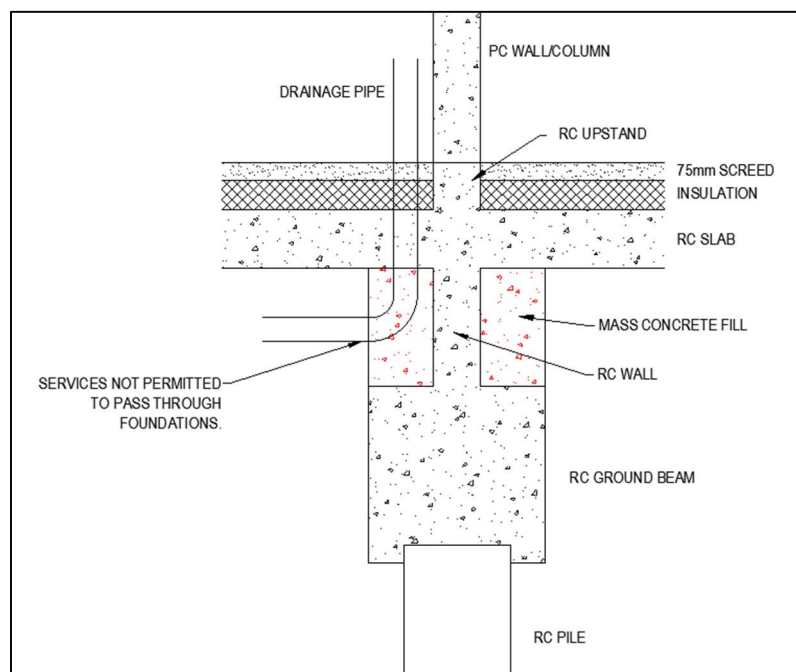


Figure 12 – Internal Dropped Ground Beam

3.0 SITE SERVICES

Surface water and wastewater drainage as well as water services will be provided in accordance with the requirements of both Cork City Council and Irish Water, as described in the following sub sections. The proposed combined services layout is presented in Figure 13 below.

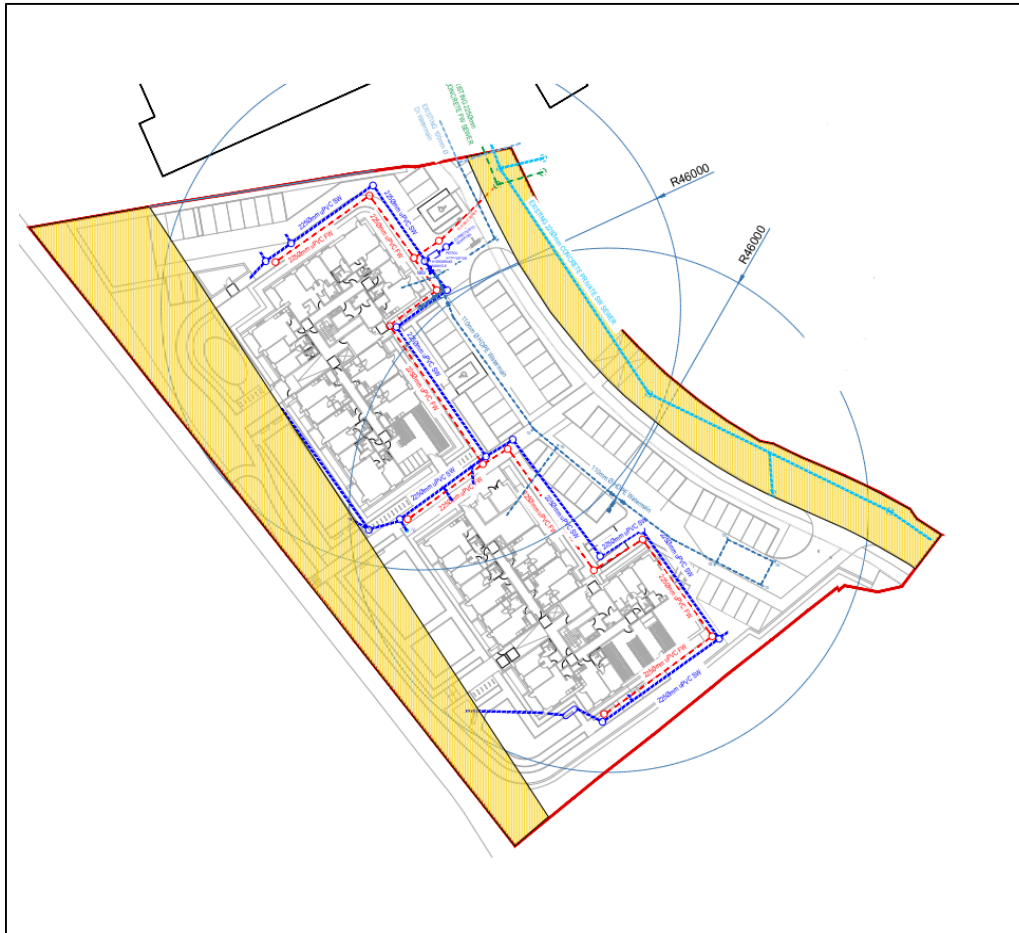


Figure 13 – Combined Services Layout

3.1 SURFACE WATER DRAINAGE

3.1.1 Existing Site Topography and Proposed SuDS Strategy

The existing site is a greenfield site and does not discharge any surface water from the site. A Site suitability assessment was undertaken for the site and it was determined that the subsoil conditions had 'very poor infiltration'. The use of SuDS measures that require infiltration to the ground will therefore be removed. The greenfield runoff rate for the site was calculated using the estimation tool on www.uksuds.com. The rainfall data was taken from Cork Airport. The permitted surface water discharge rate from the development will be restricted to the 1 in 1 year (Q1) greenfield runoff rate, as calculated using the IH124 method. The proposal also considers a 20% allowance for climate change. Based on the greenfield runoff calculations, the allowable discharge rate for year 1 has been set at approximately 3.7 l/s. The calculation and results are presented in Appendix B.

SuDS drainage systems are considered to be environmentally beneficial, causing little to no long-term impact on the environment. We would propose SuDS measures as follows:

SuDS implementation is at the core of the proposed surface water drainage strategy for this development to allow for the application of nature-based solutions (NBS), which, whilst providing temporary water retention, will also allow for the integration of green infrastructure within the development. Ancillary benefits will also be provided due to these measures inclusive of run-off cleansing, net biodiversity gains and the potential promotion of the development through educational opportunity for the wider community.

This incorporation is in alignment with the SuDS hierarchal selection order proposed by the Local Authority whereby source control is idealised inclusive of rainwater harvesting, green roofs, raingardens and bio-retention tree pits amongst others. Attenuation tanks, which, in accordance with this hierarchal selection are noted to be only considered as a last resort, will now be proposed due to the poor infiltration rate on the site.

Specific SuDS measures that are potentially deemed suitable for this development are the following:

- Green/blue roofs, to be located on the residential buildings. This system will be in place to retain rainfall at the source, reducing peak runoff rates and promoting evapotranspiration. The vegetative layer will also contribute to thermal insulation and biodiversity. The blue roof system will cater for the rainfall on the roof and reduce the required capacity of the below ground attenuation tank.
- Raingarden to be located to the rear of the buildings. This will naturally filter surface water runoff through vegetated channels, mimicking natural hydrological

responses and enhancing local biodiversity. The swale will slow down water movement, allowing for infiltration and pollutant removal before water enters the drainage network.

- Open Green Areas – Provides interception storage for between 5-10 mm of rainfall and provide treatment by filtration through the planter soils. These planted areas will also provide a medium for removal of pollutants and will improve the quality of surface runoff discharging to groundwaters.
- Rainwater Harvesting and Collection – Rainwater harvesting systems will collect runoff from roofs for non-potable uses like irrigation.
- Retaining and Enhancing Natural Vegetation – Maintaining existing trees and planting additional native trees and hedgerows to improve evapotranspiration and runoff absorption.
- Surface Water Attenuation – Designed to prevent flooding by managing peak flows via temporary storage and releasing this gradually.
- Tree Pits – Designed to collect, store and provide treatment via filtration and phytoremediation of surface runoff within the underlying ground.

Each proposal was examined and evaluated on its merits and suitability under the site specific constraints for use in the proposed development site. Upon review, the following design approach summaries are deemed appropriate and are proposed to be implemented as part of a SuDS treatment drainage approach;

- Green Roofs,
- Raingardens,
- Tree Pits,
- Rainwater Harvesting Tank
- Attenuation tank and,
- Retaining and Enhancing Natural Vegetation.

To complement this, pollution control and water quality protection measures that will be considered include;

- Silt Traps and Sediment Controls – To prevent blockages, maintain infiltration efficiency and to ensure no silt discharge to the receiving environment.
- Bypass Interceptors - These will be provided at all surface water discharge points of the development prior to discharge into the existing surface water network to prevent any deterioration of water quality in downstream waterbodies.

3.1.2 Green Roofs

Green roofs have been incorporated into the development proposals across the roofs of the new residential blocks. Green roofs function through the retention, detention, and evapotranspiration of rainfall, thereby reducing peak discharge rates at source and runoff volumes to downstream drainage infrastructure.

The green roof system will consist of a vegetation layer over a multi-layered build-up that includes growing medium, drainage layers and waterproof membrane. This system will provide temporary surface and subsurface storage and will contribute to improved water quality through natural filtration and pollutant interception. Refer to Figure 14 below for a cross section of a typical extensive green roof extracted from the IKO Website.

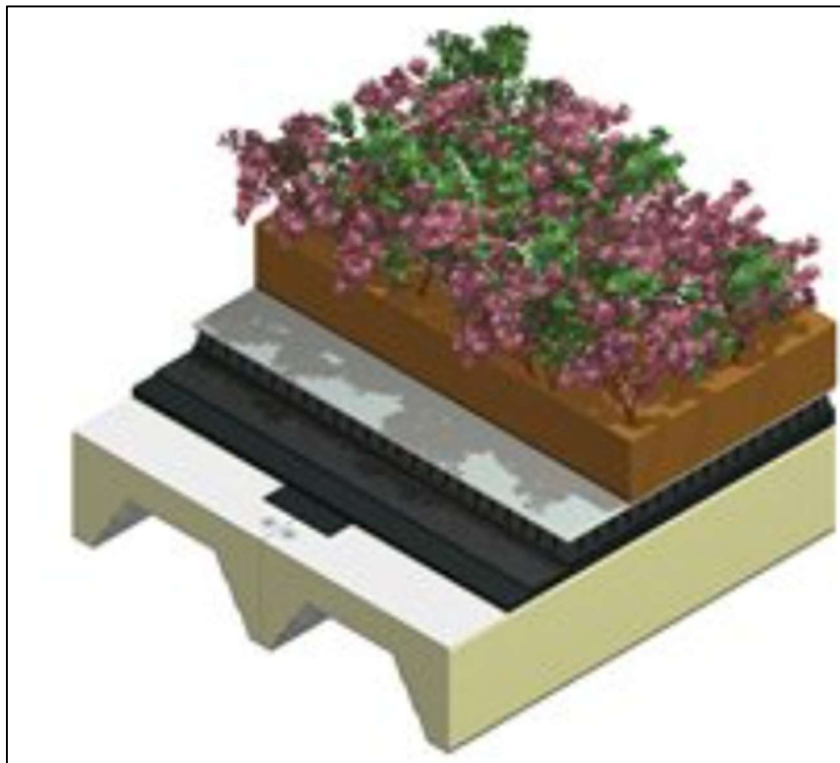


Figure 14 – Extensive Green Roof From IKO

The proposed roofs will comprise of either extensive or intensive green roofs. Extensive green roofs comprise of low-maintenance, drought-tolerant vegetation such as mosses, sedums, succulents, herbs or grasses, supported by a shallow substrate layer (typically 20–150 mm), over a drainage layer and waterproofing membrane. These roofs are typically inaccessible and only require periodic maintenance. Intensive green roofs are deep-soil systems that support a wide range of plants, including shrubs and trees. They are heavier, require more maintenance, and are often accessible for use as rooftop gardens or amenity spaces. The type of green roof will be fully designed at detail design stage.

Green roofs are to be maintained in accordance with Section 12.12 of the CIRIA SuDS Manual C753. Refer to Figure 16 for Table 12.5.

The blue roof system offered by IKO could be used in conjunction with the green roof system to work in tandem. See Figure 15 below.

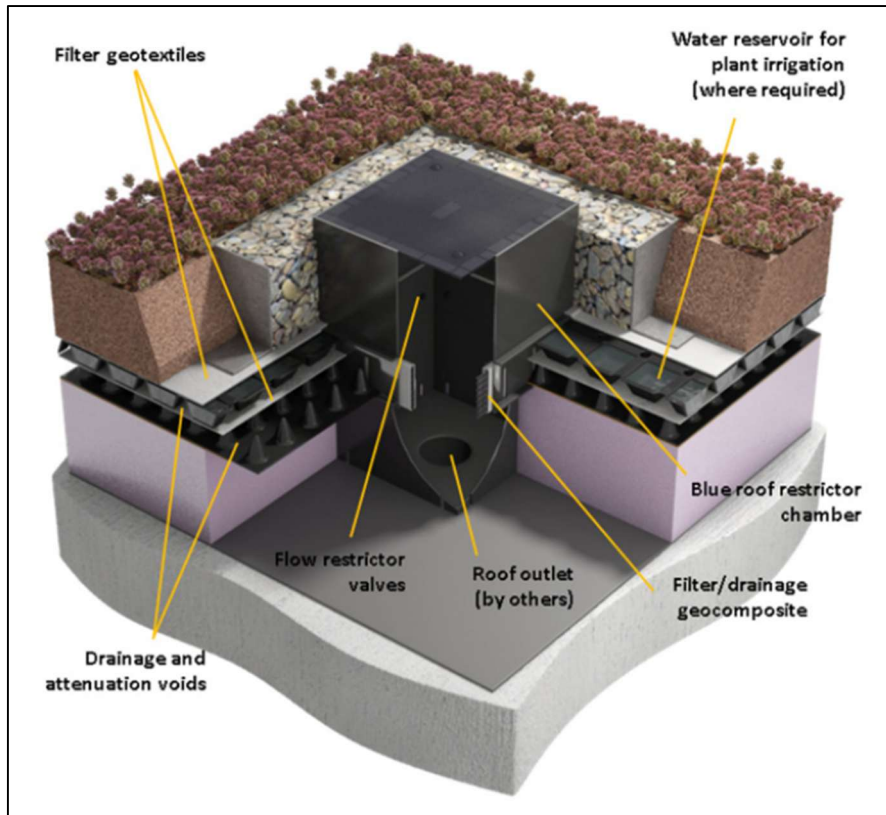


Figure 15 – IKO Blue Roof System

TABLE 12.5 Operation and maintenance requirements for green roofs		
Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Figure 16 - Operation and Maintenance Requirements for Green Roofs from Table 12.5 CIRIA SuDS Manual C753

3.1.3 Tree Pits

Tree pits are proposed throughout the development within hard landscaped areas to provide integrated surface water management, amenity and ecological benefits. These tree pits are designed as bioretention features that collect, store, treat and attenuate runoff from surrounding impermeable surfaces, contributing to source control. Refer to Figure 17 overleaf for a typical tree pit section.

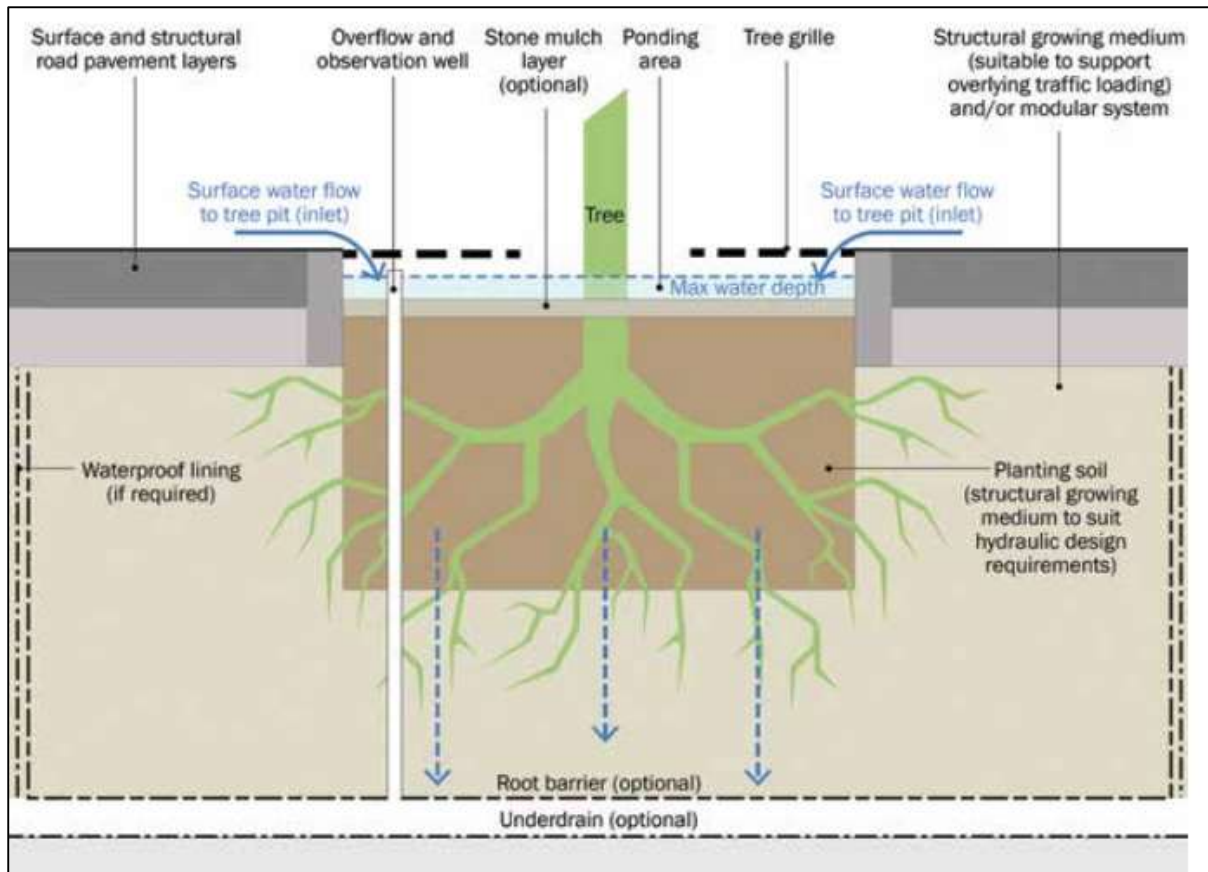


Figure 17 - Tree Pit Cross Section from Figure 19.15 of CIRIA SuDS Manual C753

Tree pits provide multiple hydrological functions such as;

- Interception - Tree canopies intercept rainfall, reducing effective runoff. Interception and evapotranspiration may reduce annual runoff by 25–45% for conifers and 10–25% for broadleaves.
- Infiltration - Where soil conditions allow, water infiltrates to ground. In other cases, outlets manage flow to the drainage system.
- Peak flow control - Pits offer attenuation storage, designed to drain down generally within 48 hours to maintain healthy root conditions.
- Treatment - The engineered soil and tree root systems remove sediments through filtration, adsorption, and biological uptake.

Native tree species will be selected based on site-specific constraints, including soil volume, water availability, and canopy space. Trees will be located to avoid conflict with underground utilities using root barriers and protective systems where necessary. Figure 18, provides guidance on the type of operational and maintenance requirements that is required for this system.

TABLE 19.3 Operation and maintenance requirements for trees (after CRWA, 2009)		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets and outlets	Inspect monthly
Occasional maintenance	Check tree health and manage tree appropriately	Annually
	Remove silt build-up from inlets and surface and replace mulch as necessary	Annually, or as required
	Water	As required (in periods of drought)
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly

Figure 18 - Operation and Maintenance Requirements for Trees from Table 19.3 CIRIA SuDS Manual C753.

3.1.4 Raingarden

New raingardens are proposed to manage surface water runoff from adjacent hardstanding areas and access roads. These features are intended to provide shallow vegetated conveyance channels and planted depressions which intercept, slow, treat, and convey runoff. They promote infiltration to the underlying soil where conditions permit and offer temporary surface storage during rainfall events.

Raingardens, which function similarly to swales but are generally smaller and often integrated into landscape design features, are proposed at selected locations where appropriate within the proposed development site plan. These are designed with engineered soils and specific vegetation to maximise pollutant removal and evapotranspiration, while also contributing to site biodiversity and visual amenity. Refer to Figure 19, for an example of a typical raingarden detail.

Swales and rain gardens are to be maintained in accordance with the guidance in Section 18.12 of the CIRIA SuDS Manual C753 and in Figure 20.

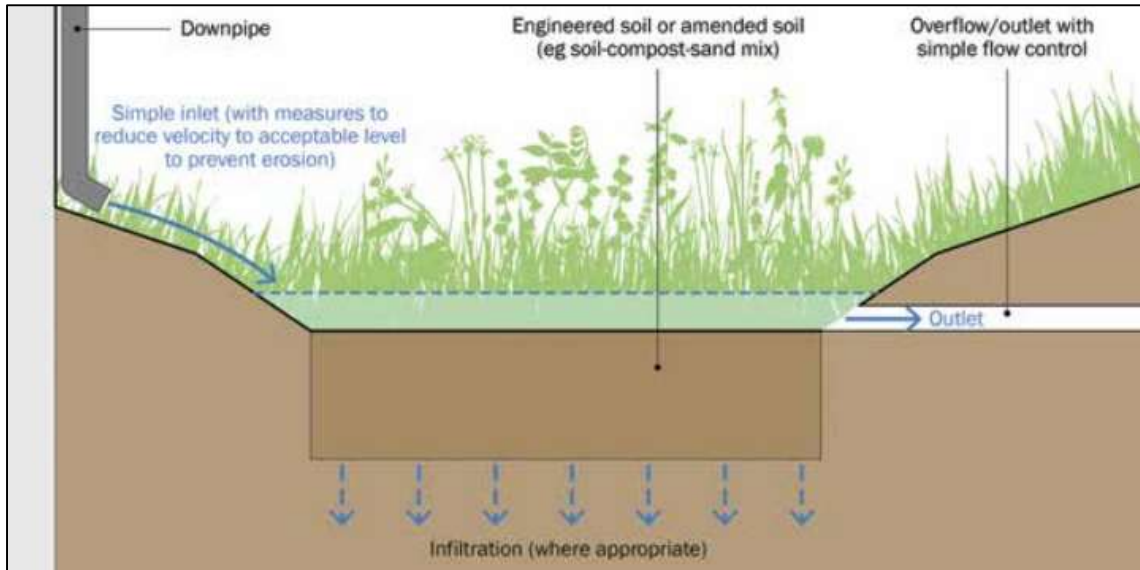


Figure 19 - Raingarden Cross Section from Figure 18.2 of CIRIA SuDS Manual C753

TABLE 18.3 Operation and maintenance requirements for bioretention systems			
Maintenance schedule	Required action	Typical frequency	
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly	
	Check operation of underdrains by inspection of flows after rain	Annually	
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly	
	Inspect inlets and outlets for blockage	Quarterly	
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)	
	Replace any plants, to maintain planting density	As required	
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually	
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required	
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required	
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years	

Figure 20 - Operation and Maintenance Requirements for Swales and Rain Gardens from Table 18.3
Tree Pits

3.1.5 Rainwater Harvesting Tanks

An underground rainwater harvesting (RWH) tank is proposed as part of the site-wide sustainable drainage strategy to intercept and store rainfall runoff. These systems allow for the collection, storage and reuse of non-potable water and may be used as grey water in instances such as irrigation, external cleaning, toilet flushing, car washing etc. which will reduce the volume and flow of runoff entering the drainage system at peak times.

Tanks are generally gravity-based, pumped or composite systems with treatment provided depending upon final usage and an overflow is to be provided to discharge to the surface water system when necessary. Rainwater harvesting tanks are to be sized at a minimum of either 5% of the annual property water demand or 5% of the annual runoff yield of the harvested roof area. Maintenance will follow guidance set out in Section 11.11 of the CIRIA SuDS Manual and is outlined in Figure 21 below.

TABLE 11.6 Operation and maintenance requirements for RWH systems		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Figure 21 - Operation and Maintenance Requirements for RWH systems from Table 11.6 CIRIA SuDS Manual C753

3.1.6 Attenuation Tank

Attenuation tanks, which, in accordance with this hierarchical selection are noted to be only considered as a last resort, will now be proposed due to the poor infiltration rate on the site. The attenuation tank was sized based on the runoff from the impermeable areas of the proposed site plan. The rainwater on the roof will be catered for via a blue roof system. The remaining hardstanding areas on site will drain to the attenuation tank. The runoff was calculated based on a 1 in 100 year storm and 20% climate change. The calculation for the attenuation tank sizing is presented in Appendix B.

3.1.7 Retaining and Enhancing Natural Vegetation

Within the site all, where possible, existing trees and hedgerows are to be maintained, supplemented and reinforced where required for effective landscaping treatments which contribute to natural water management by promoting infiltration, reducing runoff velocity, and improving both biodiversity and site aesthetics. These vegetated elements also trap sediments and pollutants before storm water is discharged back into the environment.

Further new native tree planting will be introduced as part of the site extension aligning with biodiversity and green infrastructure objectives. This will inherently further benefit the site hydrologically offering;

- Evapotranspiration - Trees and shrubs absorb water through their roots and release moisture into the atmosphere, helping to regulate groundwater levels and reduce excess runoff.
- Soil Stabilisation - Root systems enhance soil structure, reducing erosion and minimizing sediment transfer into watercourses.
- Infiltration Enhancement – A vegetative canopy interception reduces the direct impact of rainfall on the ground, allowing for better infiltration and reducing peak surface runoff rates.

Incorporating these existing and proposed drainage features into the proposed overall SuDS strategy would assist in the conveyance and treatment of surface water runoff from the proposed development.

The above SuDS measures are indicated on the proposed stormwater drainage drawing. The provision and location of the SuDS measures will be coordinated with the Architect and Landscape Architect during the design development phase to the Local and Planning Authorities agreement.

If it is required to discharge to the main road, there is an existing storm sewer on the road. However, we understand that this sewer is not taken in charge by the local authority and would require consent from the owners to discharge.

3.2 SUSTAINABLE DRAINAGE MAINTENANCE

Examples of typical sustainable drainage maintenance needs which may be applicable to this proposed development are outlined in the following sections.

3.2.1 Tree Pits/Rain Gardens

Table 1 – Tree Pits/Rain Gardens – Sustainable Drainage Maintenance

REGULAR MAINTENANCE	FREQUENCY
Remove litter and debris.	Monthly/As required
Manage other vegetation and remove nuisance plants.	Monthly/As required
Inspect inlets and outlets	Inspect monthly/As required
OCCASIONAL TASKS	FREQUENCY
Check tree health and manage tree appropriately.	Annually
Replace mulch as necessary.	As required
Water the tree.	As required
Remove silt build-up from inlets and surface.	Annually/As required
Inspect underdrain system for blockage	As required
REMEDIAL WORK	FREQUENCY
Even when a tree is planted in optimal conditions, scenarios like pest infection, disease, and car accidents can cause the premature death of tree being necessary removal and replating of a tree.	As required
MONITORING	FREQUENCY
Inspect silt accumulation rates and establish appropriate removal frequencies.	Half-yearly

3.2.2 Attenuation Tank

The proposed attenuation tank is a Stormtech system. Maintenance plans and schedules will be developed based on the type of tank adopted. These specific maintenance needs should be monitored, and schedules adjusted to suit requirements. The maintenance needs discussed in Table 2 may be appropriate.

Table 2 – Attenuation Tank – Sustainable Drainage Maintenance

REGULAR MAINTENANCE	FREQUENCY
Inspect and identify any areas that are not operating correctly.	Monthly for three months then annually
Remove debris from the catchment surface where it may pose a risk to the tank system.	Monthly
Remove sediment from pre-treatment structures and/or internal forebays	Annually/As required
REMEDIAL WORK	FREQUENCY
Repair/rehabilitate inlets, outlet, overflows, and vents.	As required
MONITORING	FREQUENCY
Inspect inlets/outlets/vents/overflows to ensure they are in good working condition and operating as intended.	Annually
Survey the inside of tank for sediment build-up and remove if necessary	5 Years/As required

3.3 WASTEWATER DRAINAGE

The wastewater for the proposed development will connect to the main line on Blackrock Avenue adjacent the site. The proposed layout within the site can be seen in Figure 13 above.

A connection application will be sought with Uisce Eireann and all works will be designed and installed in accordance with the Uisce Eireann Code of Practice and Standards.

3.4 WATER SERVICES

The watermain for the proposed development will connect to the main line on Blackrock Avenue. The Confirmation of Feasibility received by Uisce Eireann states the following in relation to the connection – ‘*Connection to the Networks may be through 3rd party infrastructure and all relevant quality assurances, wayleaves, easements, confirmation of capacity and permissions would need to be obtained by the Developer.*’ Please see CoF in Appendix C

A connection application will be sought with Uisce Eireann and all works will be designed and installed in accordance with the Uisce Eireann Code of Practice and Standards.

4.0 SITE INVESTIGATION

A site investigation was not yet undertaken. A BOQ was prepared and issued. The site investigation will inform the foundation structure and the infiltration rate for the SuDS design.

5.0 SITE TOPOGRAPHY

The architectural site plan accounts for the existing site topography throughout. We note the requirement for a retaining wall in the area highlighted in blue below at the south of the site. There is a maximum level difference of circa 1m. Two potential options for the retaining walls are gabion baskets or an insitu concrete cantilever retaining wall. 200mm thick insitu concrete walls would be sufficient for this height of retaining.

There will be another retaining wall to the north of the site, delineated in orange below. This retaining wall will be undertaken as part of the neighbouring works.

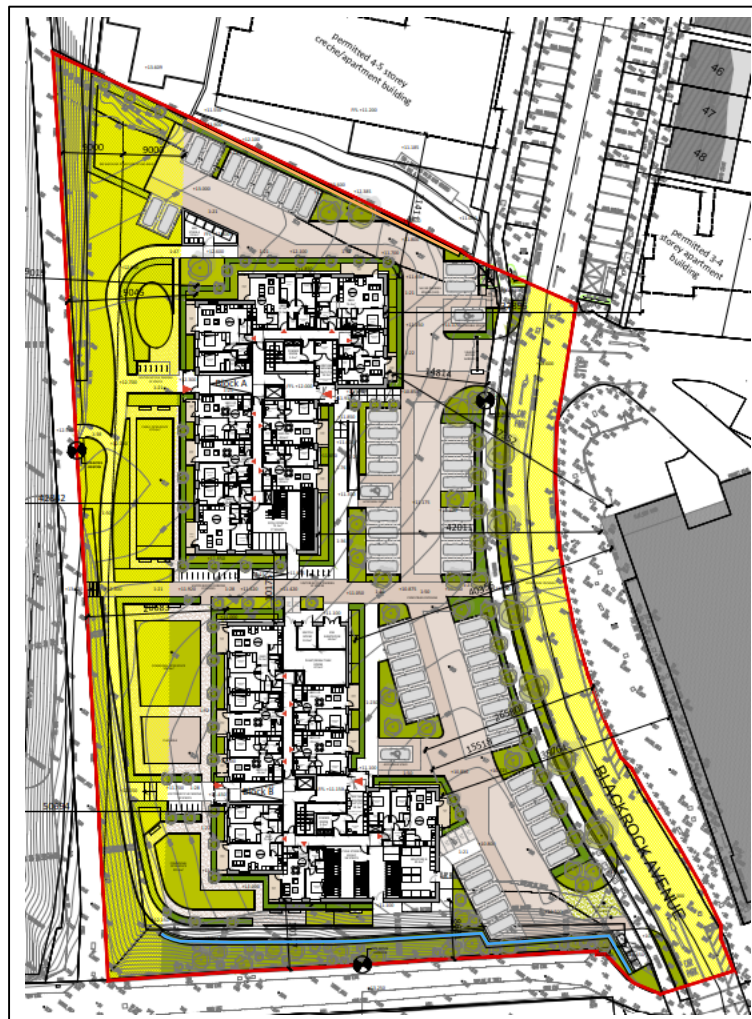


Figure 22 – External Retaining Walls

6.0 FLOOD RISK ASSESSMENT

6.1 BACKGROUND

The first stage utilizes existing information to identify and confirm whether there may be flooding or surface water management issues on a particular site that may warrant further investigation. To initially identify potential flood risks on the site and surrounding areas, a number of existing sources were studied and are described below.

This Flood Risk Assessment (FRA) for the proposed development has been prepared in accordance with the Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management' published in 2009 by the Office of Public Works (OPW) and the Department of the Environment, Heritage and Local Government (DoEHLG). This FRA addresses points 2(i), 2(ii), 2(iii) and 2(iv) of Box 5.1 | Section 5.15 of the guidelines.

The guidelines describe good flood risk practice in planning and development management and seek to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. Planning authorities are directed to have regard to the guidelines in preparation of Development Plans and Local Area Plans, and for development control purposes. For this to be achieved, flood risk must be assessed as early as possible in the planning process.

Other sources of information, used to compile this FRA include:

- OPW website: <https://www.floodinfo.ie/map/floodmaps/>
- Lee CFRAM Study

The stages involved in the assessment of flood risk are listed in the OPW publication as follows:

- Stage 1: Flood Risk Identification
- Stage 2: Initial Flood Risk Assessment
- Stage 3: Detailed Flood Risk Assessment

The OPW publication also outlines a Sequential Approach for determining whether a particular development is appropriate for a specified location in terms of flood risk. As outlined in the OPW publication, new developments are divided into three categories which are as follows: Highly Vulnerable Development, Less Vulnerable Development and Water-compatible Development.

Residential developments come under the heading of Highly Vulnerable Development.

Geographical areas are similarly divided into three categories, based on their risk of river and tidal flooding. The three categories are as follows:

- Flood Zone A – where the probability of flooding from rivers and the sea is the highest (greater than 1% or 1 in 100 year for river flooding and 0.5% or 1 in 200 year for coastal flooding).
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 year and 1% of 1 in 100 year for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 year for coastal flooding).
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 year for both river and coastal flooding i.e. all areas which are not within Zones A or B).

Based on further investigation described in the following section and as shown in Figure 23 below, the site is not in Flood Zones A or B and it is possible to identify the site to be in the Flood Zone C characterisation.

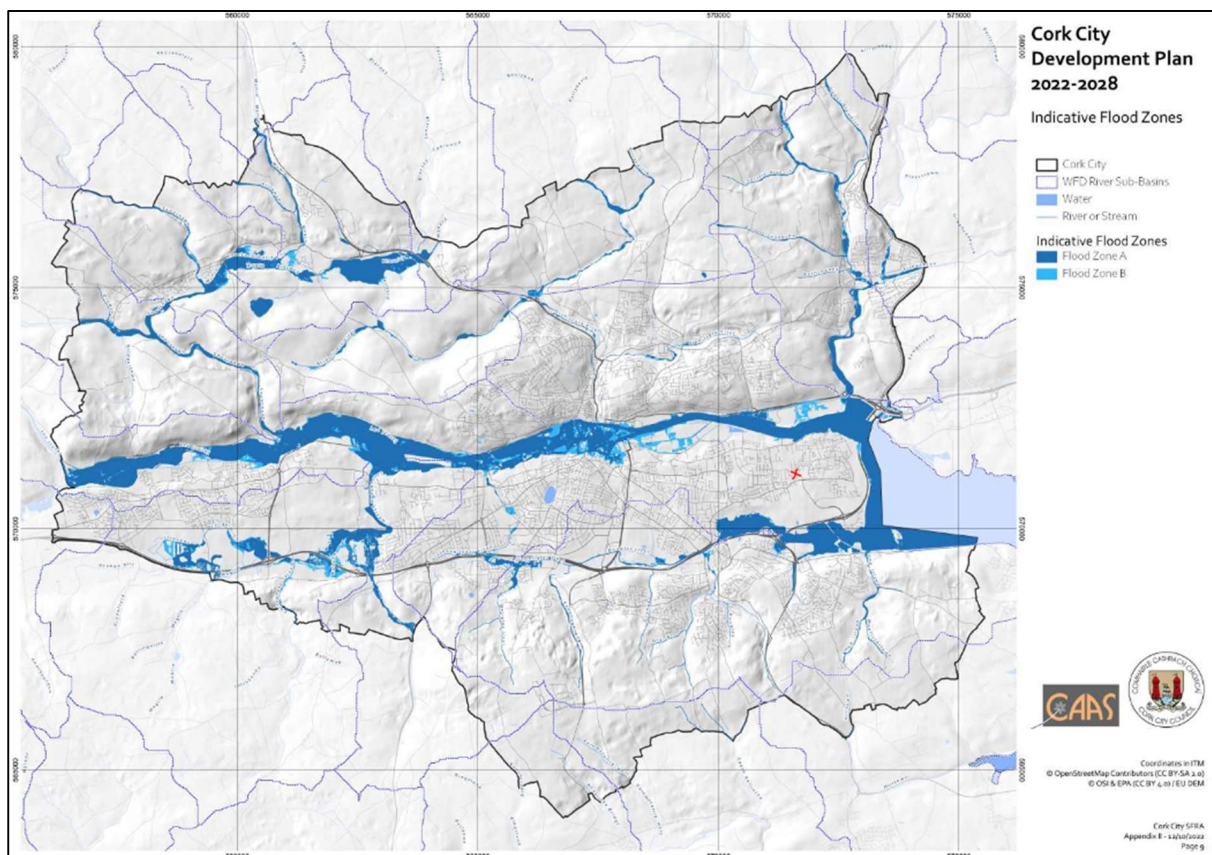


Figure 23 - Cork City Council Flood Zones

6.2 FLOOD RISK IDENTIFICATION

The first stage uses existing information to identify and confirm whether there may be flooding or surface water management issues on a particular site that may warrant further investigation. To initially identify potential flood risks on the site and surrounding areas, a number of existing sources were studied and are described below.

The first source considered is the OPW Flood Hazard Mapping service. The OPW map report shows that no flood incidents have been recorded on the full extension of the site and also no incidents of any flooding events in the immediate area.

The possibility of fluvial or tidal flooding on the site is considered utilizing the guidelines outlined in Chapter 3 of the OPW which is an overall study undertaken by the OPW.

All rain falling on hardscaped surfaces on the existing site is directed into a dedicated stormwater drainage network; therefore, the risk of pluvial flooding on the site of the proposed development is negligible.

A significant amount of information is available on potential flooding of the site and the available flood maps consider flood risk stemming from any major source of flooding such as sea, river, groundwater and rainfall as well as infrastructural sources such as water supply systems, ESB and Waterways Ireland Infrastructure, reservoirs and drainage systems. There is no history, from local knowledge, of flooding on the site.

Figure 24, below, is an extract from the OPW publication which states whether a particular development is deemed 'appropriate' for a geographical location. As per the flood zone definitions outlined above, the site proposed for the new development is located in Flood Zone C. Thus, the proposed development is deemed 'appropriate' in accordance with the OPW publication with no justification test being necessary.

DEVELOPMENT VULNERABILITY	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly Vulnerable	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

Figure 24 - Matrix of Vulnerability

6.3 INITIAL FLOOD RISK ASSESSMENT

The purpose of the flood risk assessment is to ensure that all applicable flood risk issues are assessed in relation to the decisions to be made and potential conflicts between flood risk and the proposed development are addressed. It also ensures confidence of existing site flood information and defences.

6.3.1 Tidal Flooding

Tidal flooding is caused by higher than usual sea levels, largely as a result of storm surges, resulting in the sea overflowing onto the land and is usually influenced by the following factors:

- High tide level,
- Low barometer pressure combined with high winds and,
- Wave action dependent on wind speeds, direction, local topography, and exposure.

There is no history of tidal flooding on the site and available information shows that the site is not indicated to be in a tidal risk area and this can be seen in Figure 25.

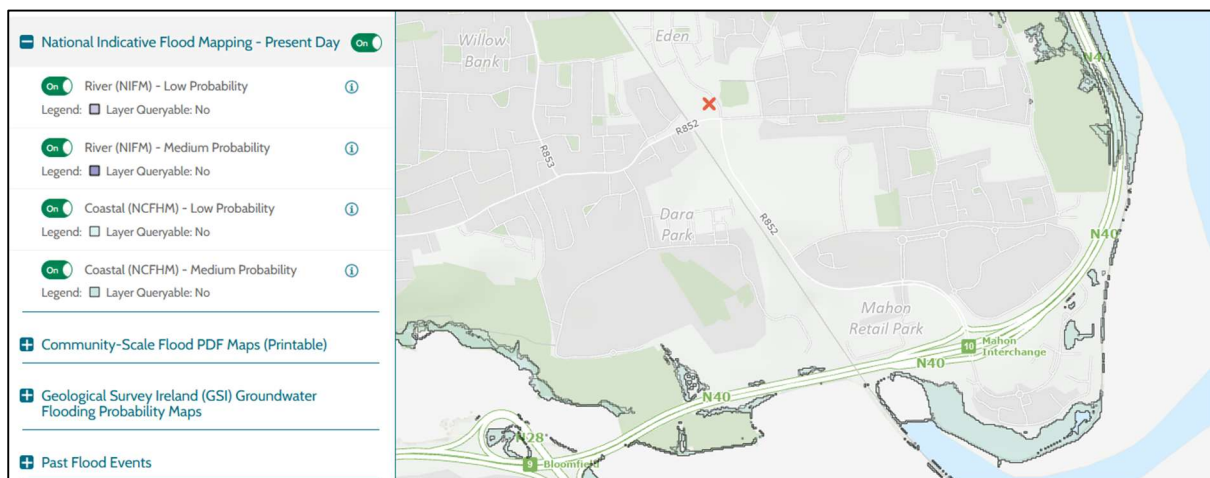


Figure 25 - OPW Flood Maps Reference; Present Day Scenario

6.3.2 Fluvial Flooding

Fluvial flooding occurs when the capacity of a watercourse is exceeded, or the channel is blocked or restricted, and excess water spills out from the channel onto adjacent low-lying areas. The nearest fluvial source to the development is the River Lee which is approximately 1.2km north of the site.

The OPW Flood Extents Map indicates no fluvial flooding within or surrounding the development site, as shown in Figure 25. Thus, it is reasonable to conclude that the related risk from fluvial flooding is deemed to be sufficiently low to be acceptable.

Given the comprehensive and detailed nature of the existing information available regarding flooding, it is not deemed necessary to conduct further investigative studies of the risk of fluvial flooding.

6.3.3 Pluvial Flooding

Pluvial or surface water flooding is the result of rainfall generated flows that arise before runoff can enter a watercourse or sewer. In undeveloped land overland flow occurs when the amount of rainfall exceeds the infiltration capacity of the ground to absorb it. This excess water flows overland forming ponds in natural hollows. Generally, in order for a site to be considered at risk from overland flooding, it would require steep gradients within or surrounding the site and a reasonably large catchment area.

Pluvial flooding is not indicated in the PFRA mapping in the Cork City Development Plan on the site and shown overleaf in Figure 26, it should be noted that no pluvial flooding has been recorded on the site and there is no historical knowledge, from local recollection, of the same. Thus, it is reasonable to conclude that the related risk of pluvial flooding on the proposed development site is deemed to be sufficiently low to be acceptable.



Figure 26 - CCDP PFRA Mapping

6.3.4 Groundwater Flooding

Groundwater flooding occurs when the level of water stored in the ground rises, as a result of prolonged rainfall, to meet the ground surface and flows out over it i.e. when the capacity of this underground reservoir is exceeded, typically during late Winter and early Spring when

groundwater is already high. Groundwater flooding tends to be very local and result from site specific factors such as tidal variations or poor ground conditions.

We note that there is no local knowledge of groundwater flooding on the site extents, thus, it is reasonable to conclude that the related risk of groundwater flooding is deemed to be sufficiently low to be acceptable.

6.4 DETAILED FLOOD RISK ASSESSMENT

The detailed flood risk assessment involves examining potential residual risks in detail for both the proposed development and its surroundings, then proposing measures to mitigate or eliminate same from the identified source.

As outlined in the previous sections, the potential risks of tidal, fluvial, pluvial, groundwater and infrastructure flooding have been outlined and the proposed development does not increase the flood risk elsewhere. Based on the assessment, the site is not at risk of tidal, fluvial, pluvial and groundwater flooding. Therefore, a detailed assessment which describes how the flood risks would be managed for the proposed development is not required.

6.5 CONCLUSION

The flood risk assessment has been carried out in accordance with the OPW Publication “The Planning System and Flood Risk Assessment Guidelines for Planning Authorities” and we conclude the following;

- The type of development for this site is residential. This is categorised by the guidelines as highly vulnerable and less vulnerable development respectively and as its location is within Flood Zone C, the development is deemed to be ‘Appropriate.’
- A justification test is not required.
- There is no risk of flooding affecting the site from tidal, fluvial or other sources.
- The development’s proposed drainage design has been developed to accommodate the 1% AEP (1 in 100 year) rainfall event.
- The development’s proposed drainage design will include for a 20% climate change allowance.
- Proposal development will not introduce people into flood risk areas.
- Proposal development will not obstruct important flow paths.
- Proposal development will not have an adverse impact on, or impede access to any nearby watercourse, floodplain or flood protection and management facilities.
- Any flood events do not cause flooding on the site of the proposed development and the proposed development does not affect the flood storage volume or increase flood risk elsewhere.

- Thus, the residual risks of flooding can be managed by incorporation of good building practice in design and construction and by management and maintenance of the site's drainage systems.

As outlined above, the proposed development has been demonstrated to be in compliance with the core objectives of the Planning System and Flood Risk Management Guidelines. This assessment confirms that there is no record of flooding on the application site and the proposed development will not increase the flood risk at this location. Surface runoff from the proposed extended area will be contained within these extended areas. It can be concluded that flood risk to the proposed development site or flood risk from the proposed development site is considered to be low.

APPENDICES

Appendix A – Hydrobrake and Petrol Interceptor Details

Technical Specification

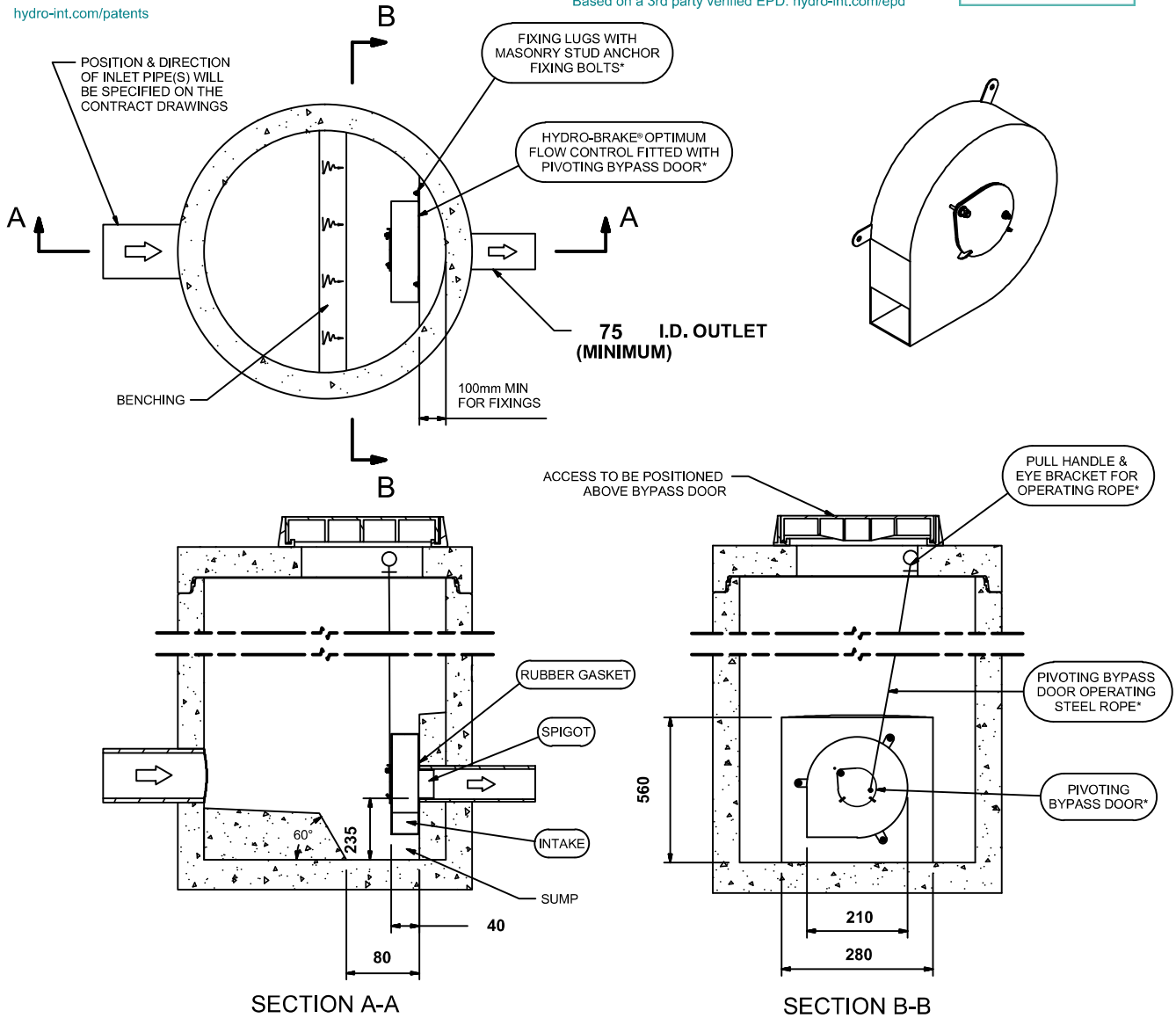
Control Point	Head (m)	Flow (l/s)
Primary Design	2.300	0.800
Flush-Flo™	0.152	0.394
Kick-Flo®	0.305	0.334
Mean Flow		0.573

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 3 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 5 kg
- Product Carbon Footprint: 9.87 kgCO₂e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
 HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

**DESIGN
 ADVICE**
 !

The head/flow characteristics of this SHE-0034-8000-2300-8000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	08/01/2026 14:35
SITE	26 21 0122 Holywell Swords
DESIGNER	
REF	HQT-203445

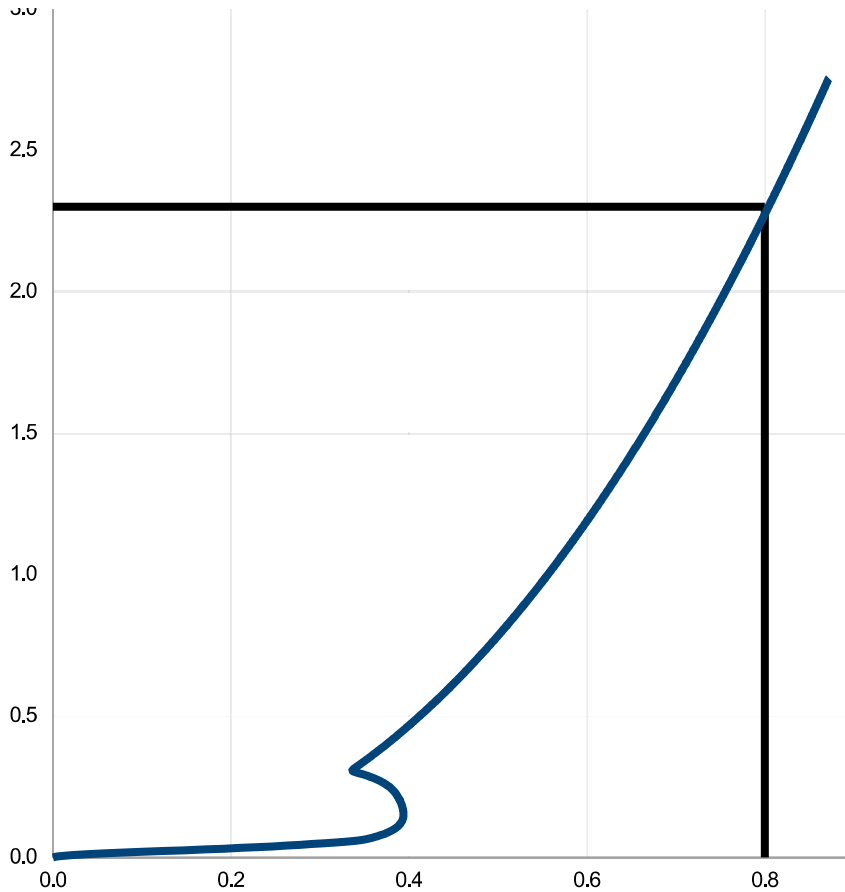
SHE-0034-8000-2300-8000
 Hydro-Brake® Optimum

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.300	0.800
Flush-Flo™	0.152	0.394
Kick-Flo®	0.305	0.334
Mean Flow		0.573



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.079	0.370
0.159	0.394
0.238	0.382
0.317	0.340
0.397	0.374
0.476	0.404
0.555	0.431
0.634	0.457
0.714	0.480
0.793	0.503
0.872	0.524
0.952	0.544
1.031	0.564
1.110	0.582
1.190	0.600
1.269	0.618
1.348	0.634
1.428	0.650
1.507	0.666
1.586	0.682
1.666	0.696
1.745	0.711
1.824	0.725
1.903	0.739
1.983	0.753
2.062	0.766
2.141	0.779
2.221	0.792
2.300	0.804

DESIGN ADVICE



The head/flow characteristics of this SHE-0034-8000-2300-8000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

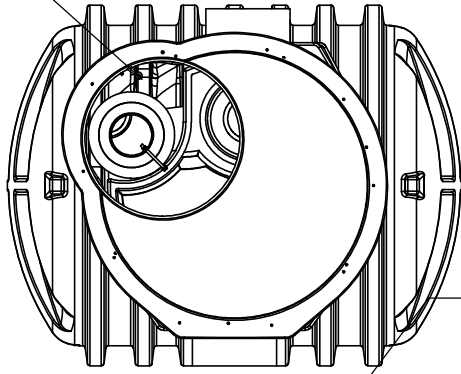
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	08/01/2026 14:35
Site	26_21_0122 Holywell Swords
DESIGNER	
Ref	HQT-203445

SHE-0034-8000-2300-8000
Hydro-Brake® Optimum

Alarm Probe Tube
(see note 7)



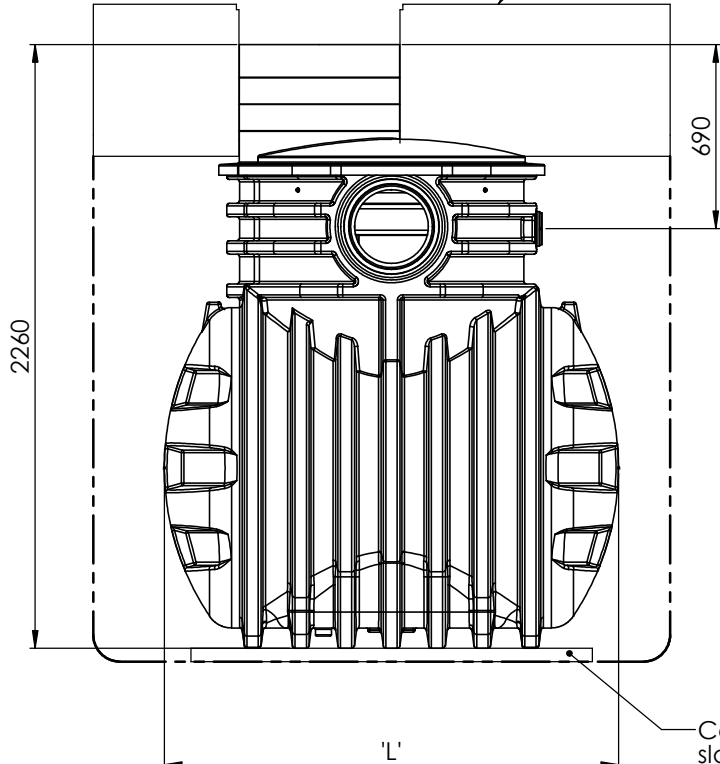
Concrete cover slab cast by client
(to suit light vehicle loading)

Unit Ref No	Nominal Flow	Dim L (mm)	Approx Empty Weight (kgs)	Fall across unit	Inlet Invert 'A'	Outlet Invert 'B'
NSBP003	3 L/s	1700	180	100	Ø160 mm	Ø160 mm
NSBP004	4 L/s	1700	180	100		Ø315 mm
NSBP006	6 L/s	1700	180	100	Ø315 mm	Ø315 mm

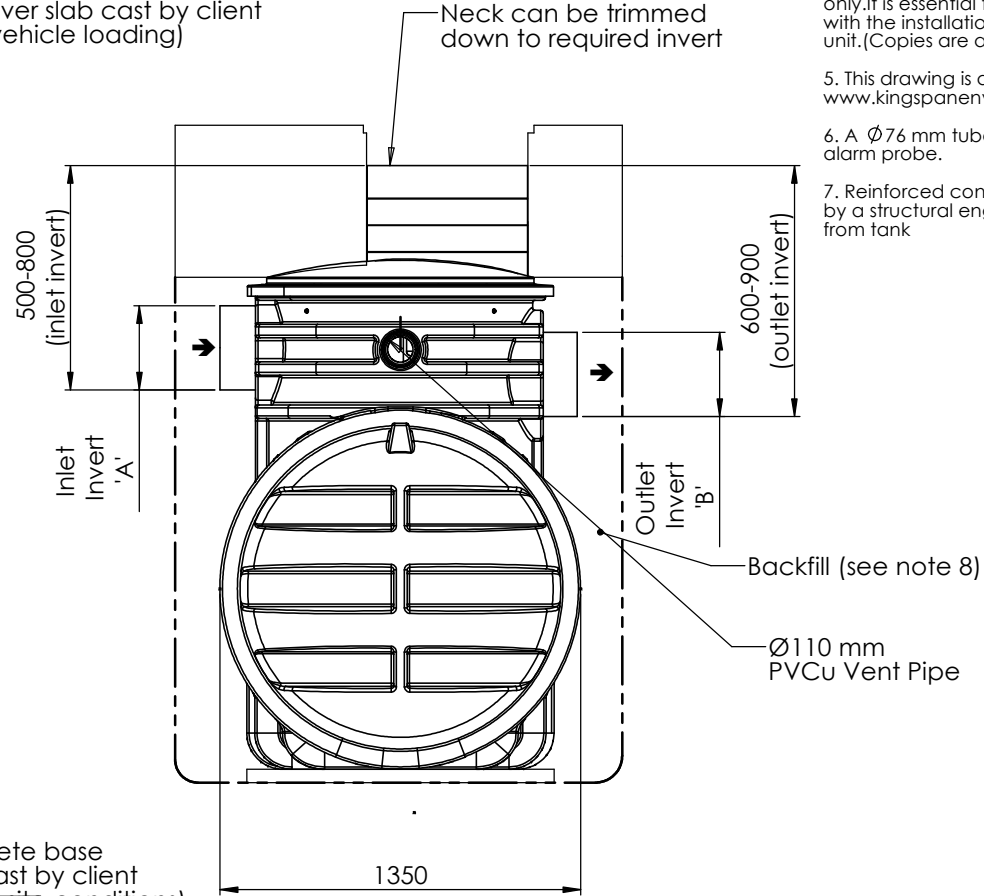
** Inlet/Outlet A must equal B**

Notes:-

1. Inlet/Outlet pipes are plain pipe Ø315 mm PVCu. The standard EN 858 states minimum connection sizes, units ordered with different sized connections are not fully compliant with the standard.
2. Extension necks for deeper inverts can be provided. These can be cut in 200 mm sections. Max 2.0m Invert recommended. Please ask our sales department for further details.
3. All units require appropriate cover and frame to suit applied loadings.
4. This drawing should be used for dimensional information only. It is essential that this drawing is read in conjunction with the installation guidelines supplied with the unit. (Copies are available from our sales dept.).
5. This drawing is also available on our website www.kingspanenv.com.
6. A Ø76 mm tube (internal) is supplied to house an oil alarm probe.
7. Reinforced concrete backfill structure must be designed by a structural engineer to remove all loads and forces from tank



Concrete base slab cast by client
(to suit site conditions)



Please check with Kingspan Environmental that this drawing is the latest issue

Issue	Date	Drawn by	Approved by	Description
06	15/12/10	S.Gill		CC934
05	24/03/10	S.Gill		CC817
04	24/02/10	S.Gill		CC794
03	23/02/10	S.Gill		Table Edited
02	23/09/09	S.Gill		Drawing Title Changed
01	19/03/09	S.Gill		Initial Release

Material : n/a	Tolerance : n/a
Finish : n/a	Thickness : n/a
Weight : Kgs n/a	Surface Area : n/a

Drawing : NSBP003,004 & 006 Sales Drawing (Vehicle Loading) Page 1 of 1

Drg No: DS1013

All dimensions in mm

Scale: Not to scale

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Appendix B – Soakaway and Attenuation Calcs

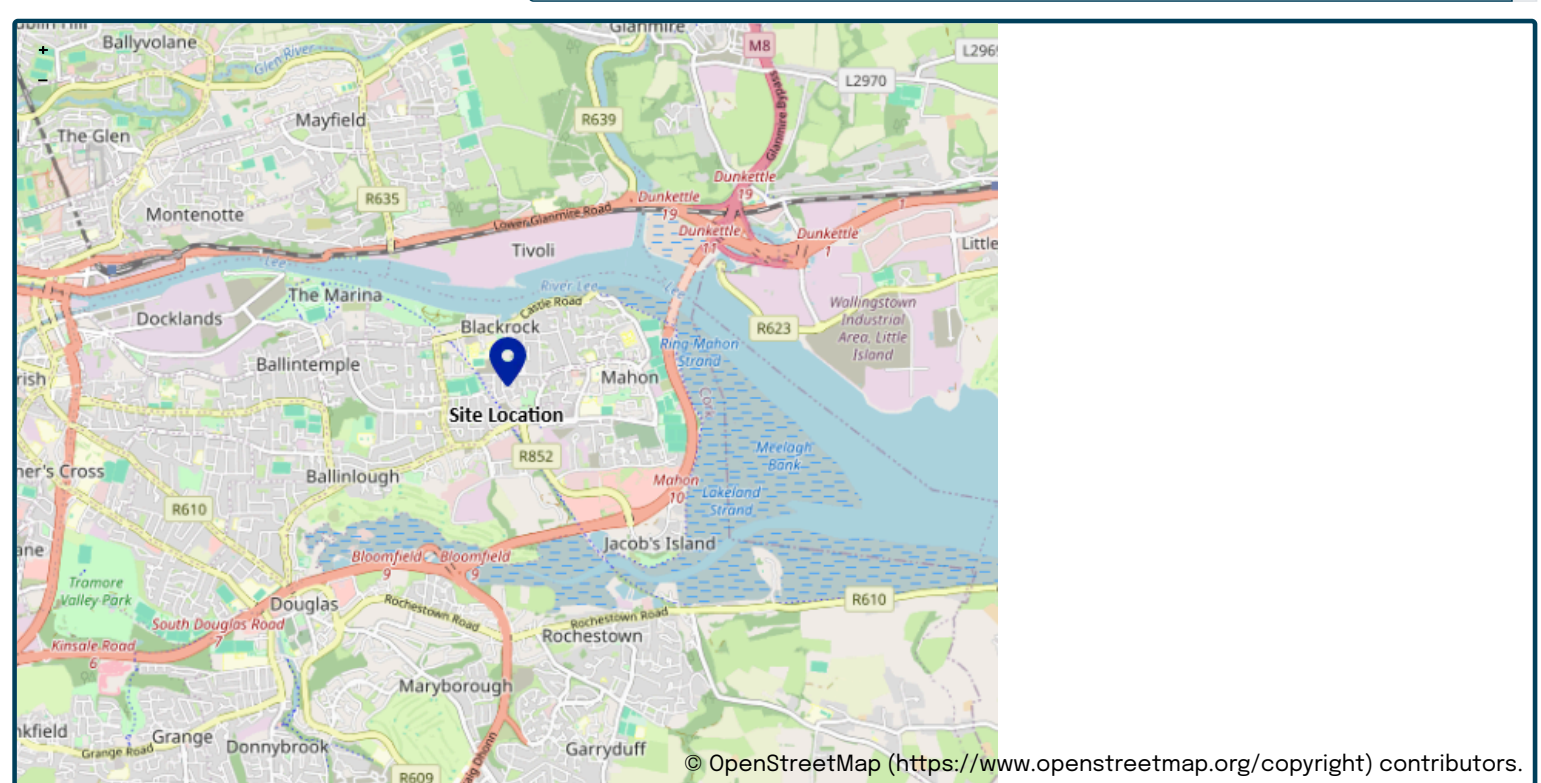
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	<input type="text" value="03/04/2026"/>
Calculated by	<input type="text" value="William O'Sullivan"/>
Reference	<input type="text" value="Sk RD"/>
Model version	<input type="text" value="2.2.3"/>

Location

Site name	<input type="text" value="Skehard Rd"/>
Site location	<input type="text" value="Cork"/>



Site easting (Irish Grid)	<input type="text" value="171667"/>
Site northing (Irish Grid)	<input type="text" value="71069"/>
Site easting (Irish Transverse Mercator)	<input type="text" value="571623"/>
Site northing (Irish Transverse Mercator)	<input type="text" value="571131"/>

Site details

Total site area (ha)	<input type="text" value="0.7833"/>	ha
----------------------	-------------------------------------	----

Greenfield runoff

Method

Method

IH124

	<u>My value</u>	<input type="text" value="1239"/>	mm	<input type="radio"/>	<u>Map value</u>	<input type="text" value="1111"/>
SAAR (mm)						
How should SPR be derived?		<input type="text" value="WRAP soil type"/>				
WRAP soil type		<input type="text" value="3"/>		<input type="radio"/>		<input type="text" value="4"/>
SPR		<input type="text" value="0.37"/>				
QBar (IH124) (l/s)		<input type="text" value="4.4"/>				<input type="text" value="l/s"/>

Growth curve factors

	<u>My value</u>	<input type="text" value="13"/>	<input type="radio"/>	<u>Map value</u>	<input type="text" value="13"/>
Hydrological region					
1 year growth factor		<input type="text" value="0.85"/>			
2 year growth factor		<input type="text" value="0.95"/>			
10 year growth factor		<input type="text" value="1.4"/>			
30 year growth factor		<input type="text" value="1.65"/>			
100 year growth factor		<input type="text" value="1.95"/>			
200 year growth factor		<input type="text" value="2.15"/>			

Results

Method	<input type="text" value="IH124"/>	
Flow rate 1 year (l/s)	<input type="text" value="3.7"/>	<input type="text" value="l/s"/>
Flow rate 2 year (l/s)	<input type="text" value="4.2"/>	<input type="text" value="l/s"/>
Flow rate 10 years (l/s)	<input type="text" value="6.1"/>	<input type="text" value="l/s"/>
Flow rate 30 years (l/s)	<input type="text" value="7.2"/>	<input type="text" value="l/s"/>
Flow rate 100 years (l/s)	<input type="text" value="8.6"/>	<input type="text" value="l/s"/>
Flow rate 200 years (l/s)	<input type="text" value="9.4"/>	<input type="text" value="l/s"/>

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Project:	Residential Development Skehard Road		
Subject:	Attenuation Tank Design		
Job No.:	25303	Calculations By:	SB
Date:	13/05/2026	Checkd By:	WOS

Reference	Calculations	Output
------------------	---------------------	---------------

Attenuation Tank Design to CIRIA 753

Location: Co. Cork (171656, 071104)

Type: Residential

Description	Area	Impermeability Factor	PIMP Area
Permeable Paving	0 m ²	95.00%	0
Concrete Path	3124 m ²	95.00%	2967.8
Green roof	1031 m ²	30.00%	309.3
Solid Roof	807 m ²	95.00%	766.65
Landscaping	2871 m ²	0.00%	0
	7833 m ²		4043.75

Total Site Area = 7833 m² = 0.007833 Km²

Total Net Area = 4043.75 m² = 0.00404375 Km²

SAAR (Met Eireann) 1239.2 mm

Soil Type	Classification	SPR
1	Highly permeable sandy soil	0.1
2	Fine sand / silts / sandy clay	0.3
3	Clay deposits / silty clay	0.37
4	Heavy clay / fine clay	0.47
5	Exposed bedrock	0.53

Soil Type 4

SOIL [SPR] 0.47

Proposed Soakaway

Infiltration rate, IR = 0.000055 m/s

FOS = 1.5

Voids Ratio = 0.4

q = IR x FOS

q = 3.66667E-05 m/s

Proposed Dimensions:

L = 0 m

W = 0 m

H = 0 m

Base Area (Ab) = 0 m²

Walls Area (P)= 0 m²

Average Q= 0 m³/s

Average Q= 0 L/s

Infiltration not feasible.

Project:	Residential Development Skehard Road		
Subject:	Attenuation Tank Design		
Job No.:	25303	Calculations By:	SB
Date:	13/05/2026	Checkd By:	WOS

Reference	Calculations	Output
------------------	---------------------	---------------

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 171662, Northing: 71091,

DURATION	Interval	Years													
		2	3	4	5	10	20	30	50	75	100	150	200	250	500
5 mins	3.2, 4.2	4.7	5.5	6.0	6.3	7.5	8.8	9.6	10.7	11.7	12.5	13.6	14.4	15.1	N/A
10 mins	4.5, 5.9	6.6	7.6	8.3	8.8	10.5	12.3	13.4	15.0	16.3	17.4	18.9	20.1	21.1	N/A
15 mins	5.3, 6.9	7.7	9.0	9.8	10.4	12.3	14.4	15.8	17.6	19.2	20.4	22.3	23.7	24.8	N/A
30 mins	7.0, 9.1	10.2	11.8	12.8	13.6	16.0	18.7	20.3	22.6	24.6	26.2	28.4	30.2	31.6	N/A
1 hours	9.3, 12.1	13.4	15.4	16.7	17.7	20.8	24.1	26.3	29.2	31.6	33.5	36.4	38.5	40.3	N/A
2 hours	12.4, 15.9	17.7	20.2	21.9	23.1	27.1	31.3	33.9	37.5	40.6	43.0	46.5	49.2	51.4	N/A
3 hours	14.7, 18.8	20.8	23.7	25.6	27.1	31.6	36.4	39.4	43.5	47.1	49.7	53.7	56.8	59.2	N/A
4 hours	16.6, 21.1	23.3	26.6	28.7	30.2	35.2	40.5	43.8	48.3	52.2	55.2	59.5	62.9	65.5	N/A
6 hours	19.6, 24.8	27.4	31.2	33.6	35.4	41.1	47.1	50.9	56.1	60.5	63.8	68.8	72.5	75.6	N/A
9 hours	23.2, 29.2	32.2	36.5	39.3	41.4	47.9	54.8	59.2	65.0	70.1	73.8	79.5	83.7	87.2	N/A
12 hours	26.1, 32.8	36.2	40.9	44.0	46.3	53.5	61.1	65.8	72.3	77.8	81.9	88.1	92.7	96.5	N/A
18 hours	30.9, 38.7	42.5	48.0	51.5	54.2	62.4	71.1	76.5	83.8	90.1	94.8	101.8	107.0	111.3	N/A
24 hours	34.8, 43.4	47.7	53.8	57.6	60.6	69.6	79.2	85.1	93.2	100.0	105.1	112.8	118.6	123.2	138.9
2 days	44.1, 54.2	59.1	65.9	70.3	73.6	83.7	94.3	100.8	109.6	117.0	122.5	130.8	136.9	141.9	158.4
3 days	51.8, 63.0	68.4	76.0	80.8	84.4	95.4	106.8	113.8	123.2	131.1	137.0	145.8	152.3	157.5	175.0
4 days	58.7, 70.8	76.7	84.8	90.0	93.9	105.6	117.8	125.3	135.2	143.6	149.8	159.0	165.9	171.4	189.7
6 days	70.9, 84.7	91.3	100.5	106.3	110.6	123.7	137.2	145.4	156.4	165.5	172.3	182.3	189.8	195.7	215.5
8 days	81.9, 97.2	104.4	114.5	120.8	125.5	139.8	154.4	163.3	175.1	184.9	192.2	202.9	210.9	217.2	238.2
10 days	92.1, 108.7	116.6	127.4	134.2	139.3	154.6	170.2	179.7	192.2	202.6	210.4	221.7	230.1	236.8	259.0
12 days	101.8, 119.5	128.0	139.5	146.8	152.2	168.4	184.9	195.0	208.2	219.2	227.3	239.2	248.1	255.1	278.3
16 days	119.9, 139.8	149.3	162.2	170.2	176.2	194.1	212.3	223.3	237.8	249.8	258.6	271.6	281.2	288.8	313.9
20 days	136.9, 158.9	169.2	183.2	192.0	198.5	218.0	237.6	249.5	265.1	278.0	287.5	301.4	311.6	319.8	346.5
25 days	157.1, 181.3	192.7	208.1	217.7	224.8	246.0	267.3	280.2	297.0	310.9	321.2	336.1	347.1	355.9	384.5

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

Controlled Discharge	0	l/s
Climate Change Factor	20	%
Min. Storage Volume	594.50	m ³

Duration	M100	Climate Change	Inflow	Outflow	Storage
5	12.5	15	60.656	0.00	60.66
10	17.4	20.88	84.434	0.00	84.43
15	20.4	24.48	98.991	0.00	98.99
30	26.2	31.44	127.136	0.00	127.14
60	33.5	40.2	162.559	0.00	162.56
120	43	51.6	208.658	0.00	208.66
180	49.7	59.64	241.169	0.00	241.17
240	55.2	66.24	267.858	0.00	267.86
360	63.8	76.56	309.590	0.00	309.59
540	73.8	88.56	358.115	0.00	358.11
720	81.9	98.28	397.420	0.00	397.42
1080	94.8	113.76	460.017	0.00	460.02
1440	105.1	126.12	509.998	0.00	510.00
2880	122.5	147	594.431	0.00	594.43
min	mm	mm	m ³	m ³	m ³

Soakaway Storage Volume: 0 m³

Remaining Volume Required: 594.50 m³

Provide 165m3 of Blue Roof Storage to take roof rainfall only

Proposed Attenuation Tank Size:

Depth =	2 m
Width =	15 m
Height =	15 m
Volume =	450 m ³ > 429.50 m ³

Design Okay

Appendix C – UE Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Sean Brady
The Chapel
Blackrock House
Blackrock Road
Cork
Co. Cork
T12 KRK7

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

12 May 2026

**Our Ref: CDS26002901 Pre-Connection Enquiry
Skehard Road, Blackrock, Cork, Co. Cork**

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 116 unit(s) at Skehard Road, Blackrock, Cork, Co. Cork (**the Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann:
Connection to the Networks may be through 3rd party infrastructure and all relevant quality assurances, wayleaves, easements, confirmation of capacity and permissions would need to be obtained by the Developer.
- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann:

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh, Rena O'Sullivan and Orlagh Nevin.

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.

Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363

Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

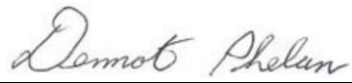
Where can you find more information?

- **Section A** - What is important to know?
- **Section B** - Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit www.water.ie/connections, email newconnections@water.ie or contact 1800 278 278.

Yours sincerely,



Dermot Phelan
Connections and Developer Services

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	<ul style="list-style-type: none"> • Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application <u>and be granted and sign</u> a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	<ul style="list-style-type: none"> • A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	<ul style="list-style-type: none"> • Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	<ul style="list-style-type: none"> • All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. <p>*Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works</p>
Fire flow Requirements	<ul style="list-style-type: none"> • The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • What to do? - Contact the relevant Local Fire Authority
Plan for disposal of storm water	<ul style="list-style-type: none"> • The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • What to do? - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	<ul style="list-style-type: none"> • Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

<p>What are the design requirements for the connection(s)?</p>	<ul style="list-style-type: none"> The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with <i>the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice</i>, available at www.water.ie/connections
<p>Trade Effluent Licensing</p>	<ul style="list-style-type: none"> Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ <p>**trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)</p>

Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.