MWP

Drainage Impact Report

Residential Development, Deerpark, Killarney, Co.Kerry

On behalf of Ross-Park Residential HS Limited

September 2026

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1. Introduction

MWP were commissioned by Ross-Park Residential HS Limited in connection with the planning application for a Residential Development at Ardshanavooly, Killarney, Co. Kerry.

MWP were appointed to prepare a Drainage Impact Assessment with respect to this development.

2. Scope of Assessment

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

- Existing Site
- Soil Type Classification
- Water Services
- Sustainable Urban Drainage Systems (SuDS)
- Flood Risk Assessment
- SuDS Maintenance

3. Existing Site

3.1 Location and Proposed Development

The development is proposed to be constructed on land north of Ardshanavooly, on the outskirts of Killarney, Co. Kerry, refer to Figure 3-1 for a site location map. The site area within the red line boundary is approximately 3.8ha. It is currently in a predominantly greenfield condition. The site is located to the north of Killarney and consists of agricultural fields on a slight south-facing slope.



Figure 3-1: Aerial Image of Proposed Site

A review of the EPA map-viewer determined that there are no watercourses traversing the proposed development site and there are none within the immediate vicinity, as shown in Figure 3-2.

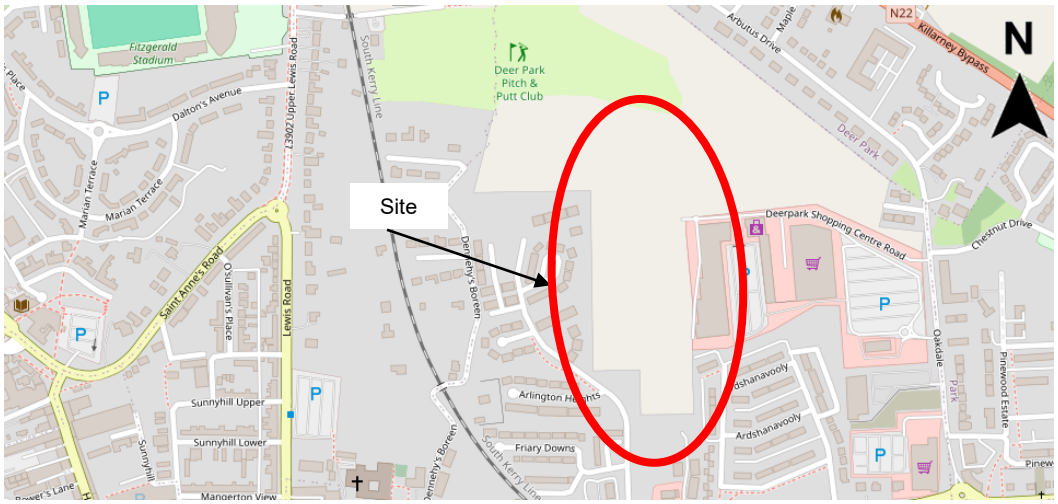


Figure 3-2: Water courses in vicinity of the site (EPA Maps)

Ross-Park Ltd intend to apply for planning permission for a Large-Scale Residential Development (LRD) at Ardshanavooly (townland), Killarney, Co. Kerry.

The development will consist of the construction of a residential development of 188 no. residential units with ancillary creche, landscaping and all associated site development works.

The proposed development includes the construction of 120 no. two storey houses comprising of 51 no. townhouse units (35 no. 3-bed units, 16 no. 4-bed units), 50 no. semi-detached units (32 no. 3-bed units, 18 no. 4-bed units), 19 no. mews houses (19 no. 2-bed units), and 68 no. apartments in 2 no. four storey blocks (36 no. 1-bed units, 32 no. 2-bed units).

Vehicular access to the proposed development will be via the proposed Killarney Strategic Links Project - Links Road A-C, part of which will be delivered by the proposed development. The design includes short and longer term future accesses reflecting the phased delivery of Links Road A-C, as well as pedestrian/cycle infrastructure to/from Friary Downs / the R876 to the south and internally within the development site and to adjoining areas.

Ancillary site works include car parking, provision of bicycle parking and bin storage facilities serving the proposed apartment/courtyard apartment buildings and creche, 1 no. ESB substation, landscaping, water services and drainage infrastructure and all associated site development works.

3.2 Topographic Survey

The site topography ranges from approximately 44 metres above ordnance datum (AOD) at the north of the site to approximately 42 metres AOD at the southern end of the site.

4. Soil Type Classification

A desk study was undertaken to review the available information on the soil type within the site. The desk study involved the following:

- Examination Geological Survey Ireland (GSI) Mapping
- Examination of the Teagasc Soil Mapping

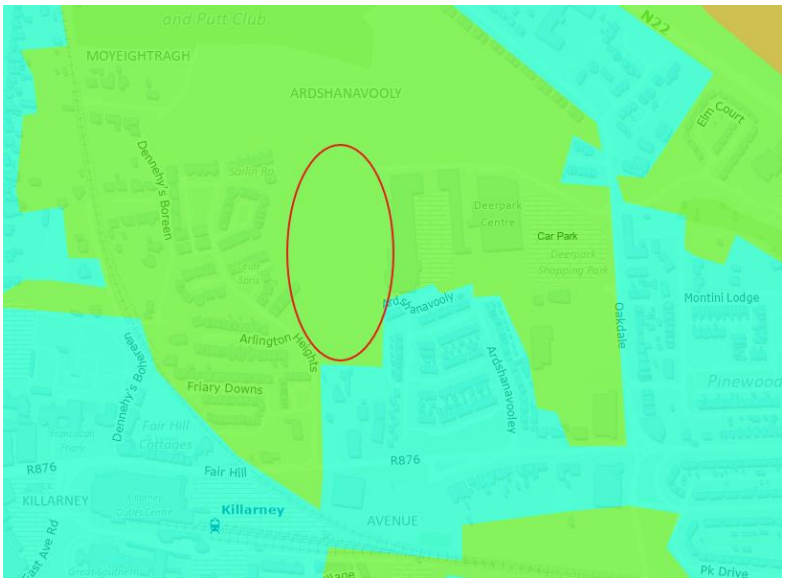


Figure 4-1: Quaternary Sediments

The GSI mapping shows the site has gravels derived from Devonian sandstone, as shown in Figure 4-1.



Figure 4-2: Bedrock Geology Map

The site is underlain by Limestone and Calcareous shale. It is from the Palaeozoic, Carboniferous, Missippian age bracket as shown in Figure 4-2.



Figure 4-3: Teagasc Soil Maps

The Teagasc soil maps indicate the site is underlain in Clashmore loamy drift with siliceous stones, as shown in Figure 4-3.

5. Water Services

5.1 Water Supply Proposals

There is an existing 250mm asbestos main, to the east of the site. A Pre-connection enquiry was submitted to Uisce Eireann (UE). UE have advised that the connection is feasible with infrastructure upgrades outlined in their Confirmation of Feasibility (COF) letter.

The existing network is shown in the Confirmation of Feasibility (COF) attached in Appendix A.

It is proposed to connect the proposed development to the existing watermains in the public road via a 150mm diameter connection. The spine within the estate has been designed as 150mm diameter and on a route so to minimize upgrade works required within the site when the future phases are constructed. Branches of 150mm diameter will serve routes with fewer than 100 residential units.

5.2 Foul Water

The COF has advised the development is feasible subject to upgrades.

The development is being served by a foul gravity sewer. The sewer will be discharged to an existing UE 225mm foul sewer located to the south of the site along Friary Downs Road.

5.3 Storm Water

Site investigations indicate the subsoils consists of sandy gravels to depth. These sandy gravels have been tested in accordance with BRE365, these tests indicate a high permeability K value up to $1.48x10^{-5}$ m/s. The results show good infiltration media, indicating that infiltration on-site is a viable method of removing surface water from the development. The infiltration testing is detailed in Section 5.5.

A SuDS system with greater at-source water quality characteristics is considered to be a more sustainable method of stormwater control on this site. The permeability of the soil allows full infiltration into the groundwater. It is proposed to install a new stormwater sewer system within the development. The design has been completed

taking cognizance of the Greater Dublin Regional Code of Practice for Drainage Woks (GDSDS) and the CIRIA SUDS manual 2015.

The surface water drainage system will incorporate all hardstand areas including rainwater from the roofs of each of the houses which will be discharged into a central carrier pipe located down the central spine corridor. Stormwater runoff along the carriageway will be directed to an attenuation/soakaway area within the green public space. The system is designed to collect the stormwater runoff generated on the site and store it in an underground stormtech attenuation tank. This tank will allow runoff to infiltrate naturally through the soil beneath and into the groundwater.

The storm sewer system was designed using an iterative approach and the use of Infodrainage software to obtain a design that incorporates these parameters and inputs. Several configurations were developed and the proposed is the option most suited to the site taking cognizance of the constraints including area and site gradients. The attenuation system has been designed based on infiltration testing carried out on the 12th of February 2026. The proposed surface water drainage strategy is based on total on-site management of stormwater runoff. All runoff generated within the development will be attenuated and discharged to ground via infiltration systems, thereby promoting groundwater recharge. No surface water outfall or discharge to adjacent lands, watercourses, or public drainage infrastructure is proposed, ensuring that all stormwater remains within the site boundary.

5.4 Design Parameters

The storm and foul network for the site is designed using hydraulic modelling software WinDes Micro Drainage. Refer to Figure 4.2 for the parameters assumed for the storm network design. All attenuation designs are based on the infiltration rates and locations. The M5-60 value 16.2 below is based on the rainfall return period data specific to the site location and is taken from the interactive map on WInDes. The ratio R value is calculated using the following formula:

R = M5 60 min/M5 2D

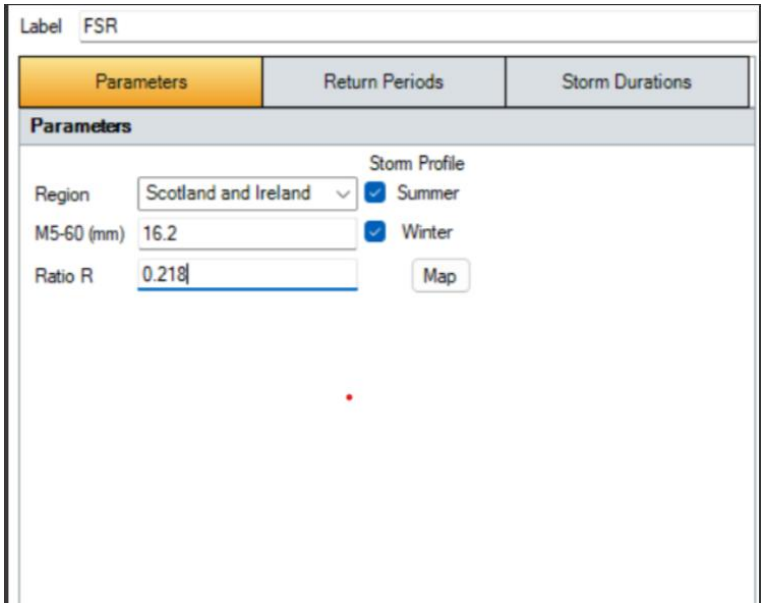


Figure 4-2: Storm Water Design Parameters

The storm drainage proposals incorporate the following elements;

- Sewers not surcharging in the 30-year event with 20% Climate Change
- Sewers not flooding in the 100-year event with 20% Climate Change.
- Class 1 Bypass Petrol Interceptors where runoff is collected from carriageway/parking areas.
- Sub-surface attenuation systems designed for storage of a 1 in 100-year storm plus 20% Climate Change.
- Interceptors (rain garden and tree pit) not taken into account in the 100 year event modelling.
- Manholes fitted with hydrobrakes will show to surcharge in the 30-year event in the microdrainage outputs. This is due to the attenuation tank requiring to fill to generate the head required for outflow

5.5 Infiltration results

Infiltration testing was completed as part of the site investigation campaign to determine site ground conditions and infiltration rates of the soil. The testing was carried out at three of the proposed soakaway locations. Further infiltration testing will be complete as part of the detailed design. A good soil infiltration rate was noted in the three of the proposed locations. The three trial pits were filled with water and levels were taken at intervals. The following soil infiltration rates (m/s) were calculated in accordance with Section 3.2 of the BRE 365 document.

Soakaway 1 =1.6 x 10-5 m/s

Soakaway 2 =1.04 x10-5 m/s

Soakaway 3 =1.48 x 10-5 m/s

The attenuation system is proposed to be constructed using a crate system by Wavin. This system was chosen to achieve the requirements of the design to cater for the volume of attenuation, minimize footprint on site and the envisaged loading requirements. The size of the attenuation system has been designed using the respective infiltration rates.

6. SUDS Measures

The aim of these measures is to design the site drainage in a manner that mimics the natural drainage process for the site pre-development and reduce the impact of the development on the environment. The SUDS measures selection process for this site were guided by the four pillars of SUDS which are Water Quantity, Water Quality, Biodiversity and Amenity. These prioritise the use of nature-based solutions with infiltration measures to promote groundwater discharge. This selection process took into account their practicability for use on the site and the constraints such as the topography and development layout so to create a SUDS Management Train.

The SUDS Management Train proposed for this site is evaluated from the point where rain falls, through the conveyance network through to how it is discharged within the site.

The Deerpark site was divided into several sub catchments, each catchment was designed to manage its own individual run off. These were chosen to regulate the flow as close to the place where rain falls as possible, rather than concentrating the flow to one spot on the site for attenuation.

The SUDS measures outlined below have been reviewed while conducting drainage design.

6.1.1 Bioretention Raingarden/ Tree pits

Bioretention Raingarden/Tree pits have the ability to contribute to the storm water management strategy while also adding to the aesthetic value of the overall development. These can increase infiltration of the soil while also removing storm water through transpiration and interception. Rainfall from nearby pavements discharges into these bioretention rain gardens/tree pits. Water infiltrates through the surface layer and filters through the soil which serves to reduce pollution. Where possible, water infiltrates directly into the ground. Any excess water will flow into the surface overflow and directed along a perforated land drain with a flow control fitted at outlets to maximize infiltration potential.

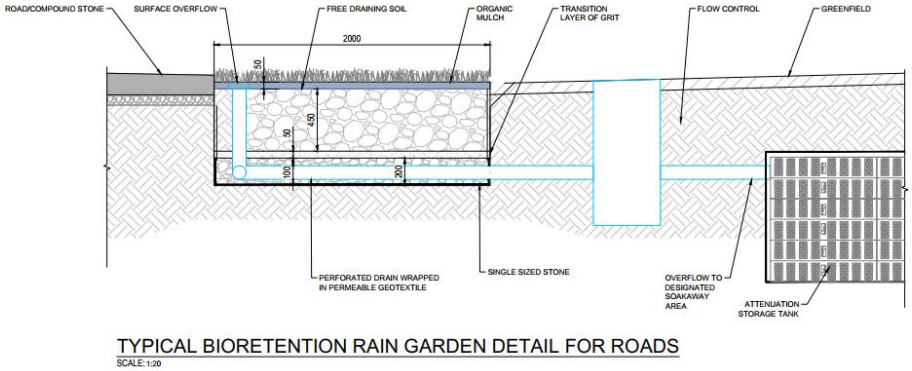
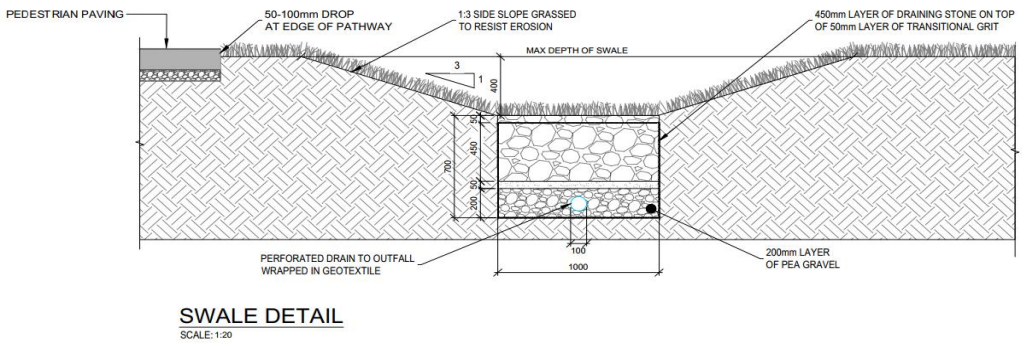


Figure 4-4: Typical Bioretention Rain Garden Detail for Roads

6.1.2 Dry Swales

Dry swales work by capturing sheet flow off the road surface. They have shallow channels with a flat bottom surface and gently sloping sides which are designed to guide and store surface water. At 10-20m intervals, stone check dams will be placed along the length of the swale to assist in reducing flow velocities. Furthermore, these dams will act as a screening mechanism to remove any pollutant load in the runoff. Beneath the swale, a filter drain will help to maximise infiltration capacity. The filter drain will also increase the attenuation volume capacity.

Figure 4-5: Typical Swale Detail



6.1.3 Petrol Interceptors

Petrol interceptors are placed in the primary storm drain system. These are essential in all new developments as they greatly assist in complying with health and safety as well as environmental legislation. Petrol interceptors work by removing any oil based liquids that make their way into the storm network system.

6.1.4 Attenuation Storage Tanks

The site will contain separate tanks of varying volume which are hydraulically connected, allowing an extra safety measure in the event one isn't performing to its design capacity. Cellular attenuation storage tanks have been chosen to maximise the allowable volume of water which can be stored on site, while also allowing infiltration to occur.

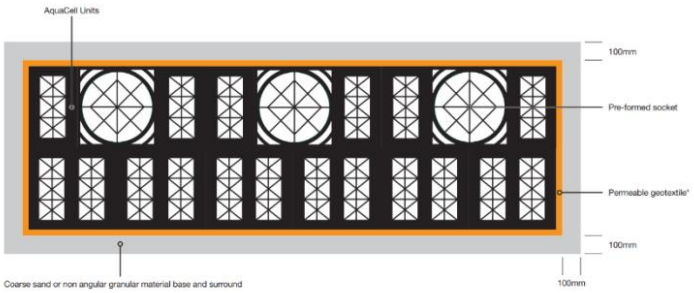


Figure 4-6: Attenuation Storage Tanks

Manholes immediately upstream and downstream of the tanks will have catch pits in order to prevent silt building up within the tanks.

Attenuation tank systems require a minimum of 0.3m cover under landscaped areas. Sizing of tanks are based on the 1 in 100 year storm event + 20% climate change factor.

7. Flood Risk Assessment

A flood assessment was carried out using OPW's website www.floodmaps.ie and can be read in full within the Flood Assessment Report.

Possible sources of flood risk were identified by

- A walkover survey of the subject site and surrounding terrain;
- Topographical survey information for the site;
- Examination of available information on the website (www.floodinfo.ie);

The Past Flood Event Local Area Summary Report was obtained from the Office of Public Works (OPW) floodinfo.ie website. This report summarises all recorded past flood events within a 2km radius of the map centre. The report shows 6 records of flooding within a 2km radius of the proposed site, refer to Figure 7-1 below. The majority of these occurred to the south and southwest of the site. There is no record of flooding in the immediate vicinity of the site, refer to Figure 7-2.

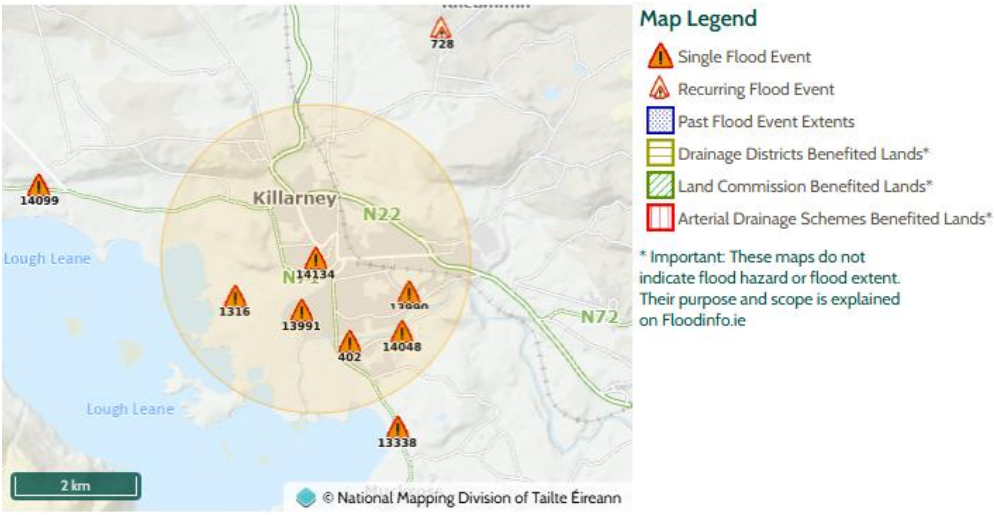


Figure 7-1: Recorded Flood Events in the vicinity of the site (Floodinfo.ie)



Figure 7-2: Recorded Flood Events in the vicinity of the site

7.1 Kerry County Development Plan SFRA 2022-2028

The county development plan shows the site is within Flood Zone C. The site is within a proposed residential area within the 'Killarney Strategic Flood Risk Assessment Map'.

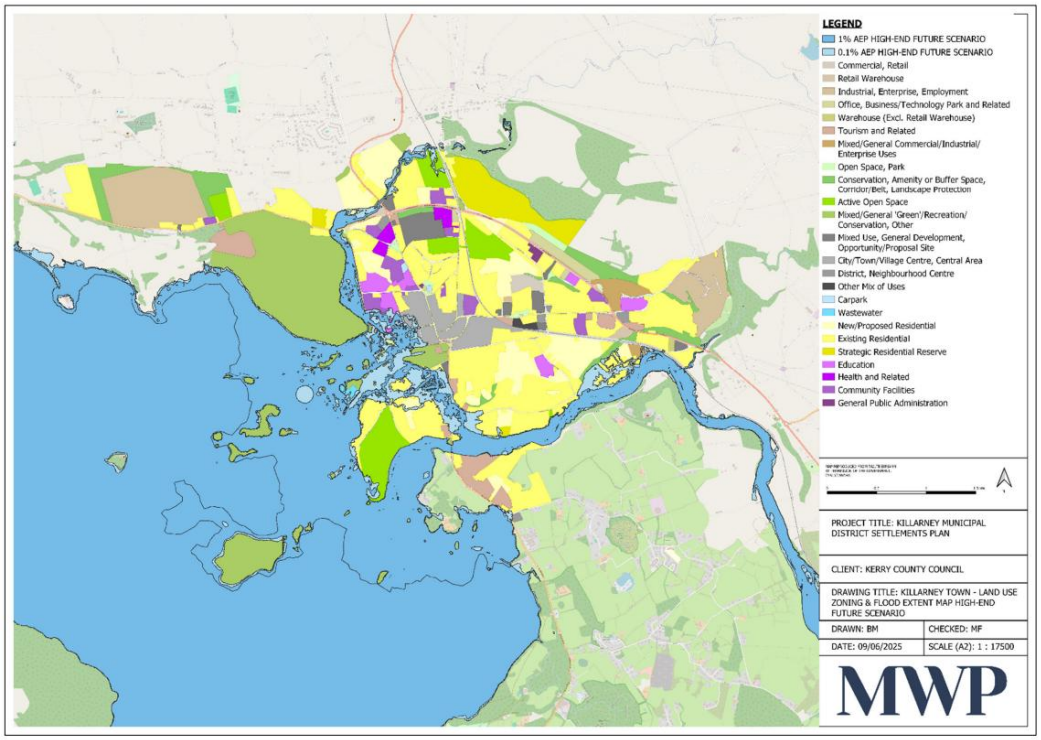


Figure 7-3: Land Use Zoning and Fluvial Flood Zone Map (Killarney)

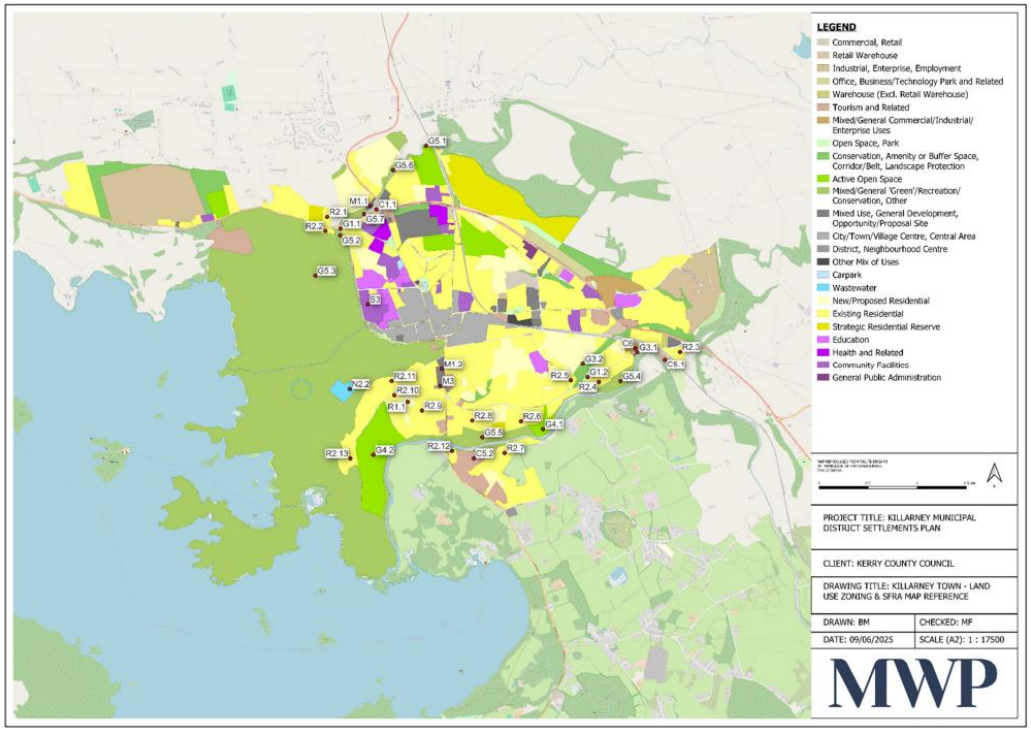


Figure 7-4: Killarney Strategic Flood Risk Assessment Map

7.2 Conclusions and Recommendations

The flood risk assessment has identified that the site is in Flood Zone C, as defined in the Flood Risk Management Guidelines. The proposed uses are justified based on existing zoning and the SFRA conducted for the Kerry County Development Plan.

8. SuDs Maintenance

All elements of the drainage system should be inspected following a major storm event. Maintenance should be carried out in tandem with the specification outlined by the manufacturer and be conducted to whichever is the most onerous. When carrying out maintenance, it is essential that a record of inspection and maintenance on all elements is kept and updated when required.

8.1 Storm Drains

It is recommended all storm drains are cleaned every 6 months. Further recommendation is shown below:

Table 8-1: Storm Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt build-up should be removed	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

8.2 Kingspan Klargester Bypass Separators

Kingspan Klargester recommends checking the oil levels after the first 3 months. This will give an indication on when the separators should be maintained.

8.3 Operation & Maintenance requirements for attenuation storage tanks as per CIRIA C753 – SuDS Manual 2015 & Wavin Aquacell O&M Manual

Table 8-2:Attenuation Tank Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify areas that are not operating correctly. Take action where required	Monthly for 3 months. Yearly thereafter.
	Remove debris from catchment surface. (where it may cause risk to performance.)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of	Annually

	filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	
	Remove sediment from pre-treatment structures, isolation rows, and/ or internal forebays	Annually, or as required
Remedial Maintenance	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 & following large storms
	Survey inside of system for sediment build-up and remove if necessary	Every 6 months or as required.

8.4 Operation & Maintenance requirements for silt traps as per CIRIA C753 – SuDS Manual 2015

Table 8-3: Silt Trap Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

8.5 Operation & Maintenance requirements for hydro brakes as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 8-4: Hydro Brake Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

8.6 External drainage system – Drainage adjacent to road

The drainage system should be inspected regularly to coincide with the aforementioned specification. A general guideline is shown below:

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

8.7 Proposed Maintenance and Inspection Schedule Record Sheet

Table 8-5: Proposed Maintenance and Inspection Schedule Record Sheet

Date	Item Inspected/ Maintained	Inspection/ Maintenance Type	Comment on condition of Item prior to the Works and detail of what works were performed	Inspected/Maintained by: