SITE SERVICES REPORT
& FLOOD RISK ASSESSMENT

Failte Ireland Water Based Activities Centre

October 20th, 2026

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Consulting Engineers

1. INTRODUCTION

This report relates to the existing and proposed site services as party of an upgrade to existing toilet facilities within the car park adjacent to Killiney beach. The report accompanies existing and proposed site drawings.

2. EXISTING TOILET BLOCK- STORM AND WASTE CONNECTIONS

2.1 Existing Foul Drainage: A full cctv survey of the existing foul lines serving the existing building is to be carried out. There appear to be 2 number foul lines (1 may be a combined line) which run south to north behind the existing toilet block. No foul connections from the existing toilet bock appear to connect to this line.

At present the existing building contains separate ladies and gents toilet facilities. These units appear to discharge to a 100 diameter upvc pipe running south to north internally prior to discharging to an external foul AJ to the north of the building. A summary of units discharging from the site is as follows;

9 wcs, 6 whbs, 3 urinals (1 long urinal unit).

The existing total peak flow is calculated as 4.87 l/s. with an average flow of 0.061l/s based on 500 daily users (10 litres each per day) and 5 staff (60 litres each per day).

2.2 Existing Storm Water:

At present a metal deck mono pitched roof slopes from front to back (west to east). The downpipes and gulley traps appear to connect to an existing combined line to the rear of the site. The ground surface storm water to the front pavement of the unit is taken by an ACO drain and gulley arrangement connecting to a 300 diameter storm pipe to the front of the site. The rainwater pipes will be disconnected from the combined line and discharge to separate rain gardens running south to north along the rear east façade prior to discharging to the mains. In summary the existing roof and surface drainage proposed to be modified is as follows;

- Main metal Deck Roof Area: 110m^2 discharges to combined line to rear

- Area of Existing Impermeable footpaths to be upgraded to permeable resin bound gravel: 70m^2
- Area of macadam to carpark to be converted to permeable paving at proposed wheelchair accessible car ports: 72m^2

Google Maps view of existing Site with Metal Deck roof to public toilets and resin bound gravel finish to west and north of building

3. PROPOSED EXTENDED TOILET BLOCK- STORM AND WASTE CONNECTIONS

3.1 Proposed Diversions of Storm and Foul lines

The new extension to the toilet block is to be located to the south of the existing building. It measures 14m long (north-south) x 7.5m wide. From an inspection of the existing public storm and foul lines, the footprint of the proposed building will encroach or intersect the south-east corner of the proposed extension. Similarly the existing 300 diameter storm pipe is located within the footprint of

the proposed extension. Diversions of both the foul and storm lines are required with a clear distance of 3m from the new building footprint to both. The proposed diversions are shown on drawing 26D/79/002.

3.2 Proposed Foul Drainage:

The combined existing and proposed foul discharge from the new complex will comprise the following;

12wcs, 12 whbs, 5 showers, 1 kitchen utility sink.

The proposed total peak flow is calculated as 5.81 l/s which is an increase of just under 1 l/s. While this is not a significant increase, the number of units served upstream from the pipe needs confirmation. The capacity of each of the 225 pipes assuming a 1:100 flow is assumed at 22.5litres/second from the table below.

As noted, the storm water from the existing roof currently discharges to the combined line. This will be corrected by discharging to a new raingarden hydroplanter located to the rear with an overflow to the rear. This reduction of 110m^ 2 will be offset by the 12.5m^2 external shower area to the south of the new building which will discharge to an Aco drain connected to the new foul system as shown.

B.1 Capacities of drains

For convenience, drain capacities calculated from Colebrook-White formula using an effective roughness of k_b = 1,0 mm and clean water with a viscosity of $\nu = 1{,}31\times10^{-6}$ m^2/s are listed in tables B.1 and B.2.

Table B.1: Capacity of drains, filling degree 50%, (h/d = 0,5)

Slope	DN 100		DN 125		DN 150		DN 200		DN 225		DN 250		DN 300	
I	Q_{max}	v	Q_{max}	v	Q_{max}	v	Q_{max}	v	Q_{max}	v	Q_{max}	v	Q_{max}	v
cm/m	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
0,50	1,8	0,5	2,8	0,5	5,4	0,6	10,0	0,8	15,9	0,8	18,9	0,9	34,1	1,0
1,00	2,5	0,7	4,1	0,8	7,7	0,9	14,2	1,1	22,5	1,2	26,9	1,2	48,3	1,4
1,50	3,1	0,8	5,0	1,0	9,4	1,1	17,4	1,3	27,6	1,5	32,9	1,5	59,2	1,8
2,00	3,5	1,0	5,7	1,1	10,9	1,3	20,1	1,5	31,9	1,7	38,1	1,8	68,4	2,0
2,50	4,0	1,1	6,4	1,2	12,2	1,5	22,5	1,7	35,7	1,9	42,6	2,0	76,6	2,3
3,00	4,4	1,2	7,1	1,4	13,3	1,6	24,7	1,9	389,2	2,1	46,7	2,2	83,9	2,5
3,50	4,7	1,3	7,6	1,5	14,4	1,7	26,6	2,0	42,3	2,2	50,4	2,3	90,7	2,7
4,00	5,0	1,4	8,2	1,6	15,4	1,8	28,5	2,1	45,2	2,4	53,9	2,5	96,9	2,9
4,50	5,3	1,5	8,7	1,7	16,3	2,0	30,2	2,3	48,0	2,5	57,2	2,7	102,8	3,1
5,00	5,6	1,6	9,1	1,8	17,2	2,1	31,9	2,4	50,6	2,7	60,3	2,8	108,4	3,2

3.3 Proposed Storm Water System:

3.3.1 Existing and Proposed Roofs

The existing and proposed roofs are to run thorough 2 separate proprietary hydroplanter rainwater gardens located approximately 1m clear of the rear façade (refer to proposed drawings). Each of the 4 rainwater pipes and gulleys from the roofs will discharge at high level leaving approximately 700 depth of planter gravel and soil below the supply invert level. The units will have 300mm of gravel at the bottom with the remainder filled with a soil medium with a 30% void ratio. This provides a total storage area below the supply pipes of approximately 5.96m^3 (28.2m^2 x 0.7m x 0.3). For a total roof area of 229m^2 (i.e. 120 m^2 existing and 109m^2 proposed). Depending on the manufacturer's supplied data, a flow control for each of the 2 units may be added. Suitable soil and plants will be advised/ provided by the specialist supplier.

3.3.2 Pavement & Wheelchair Accessible Parking:

New permeable resin bound gravel is proposed to replace an existing impervious surface area of approximately 70m^2 with permeable paving proposed within the carpark area to accommodate the new wheelchair accessible carparking area of 72m^2. (Assumed run-off coefficient 0.3 for both surfaces). These porous surface can treat rainwater at source, and allow infiltration through to an underlying porous subbase (in this case approximately 400mm of hardcore with a 30% minimum void ratio) where water can be stored within the voids before being slowly released to the drainage collection system through natural flow via the porous medium. As well as reducing the amount of runoff from the surface, permeable paving will slow down the rate of runoff from the pavement in extreme rainfall events contributing to attenuation flows. In addition, permeable paving will increase the quality of water which is intercepted by the system through filtration, biodegradation, pollutant adsorption etc

3.4 Outfall Manholes & Pipe Routes

The routes of the existing and proposed storm and foul drainage lines are shown on Drawings 26D/79/001-002.

4. WATER SUPPLY & DEMAND

There is a single water main supply to the existing building. This will be extended to the new building. As per the code of practice, the site is classified as an amenity site.

Visitors: Required water demand requirements - 10 litres per use

Expected maximum number of visitors per day - circa 500 persons per day

Water demand per day - 500 persons/day x 10 litres/use = 5000 l/day

Staff: Required water demand requirements - 90 litres per person per day

Expected maximum number of staff - 5 persons

Total water demand per day - 5 persons x 90 litres/person/day = 450l/day

Average water demand over 10 hour period (8a.m - 6p.m) - 450 litres/day / (10 hrs x 60 min x 60 sec) = 0.025 l/sec

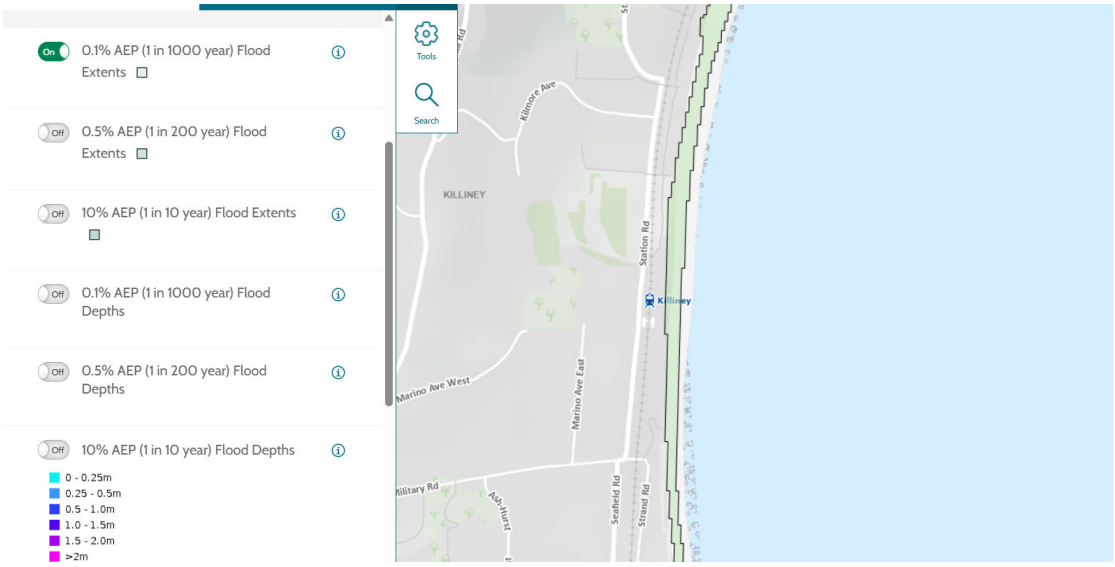
Total Daily Water Demand: 5450 l/day = 0.151 l/sec (over a 10 hour working period)

Total Peak Water Demand 5 x 0.151 l/sec = 0.76 l/sec (Irish Water Code of Practice for Water Infrastructure)

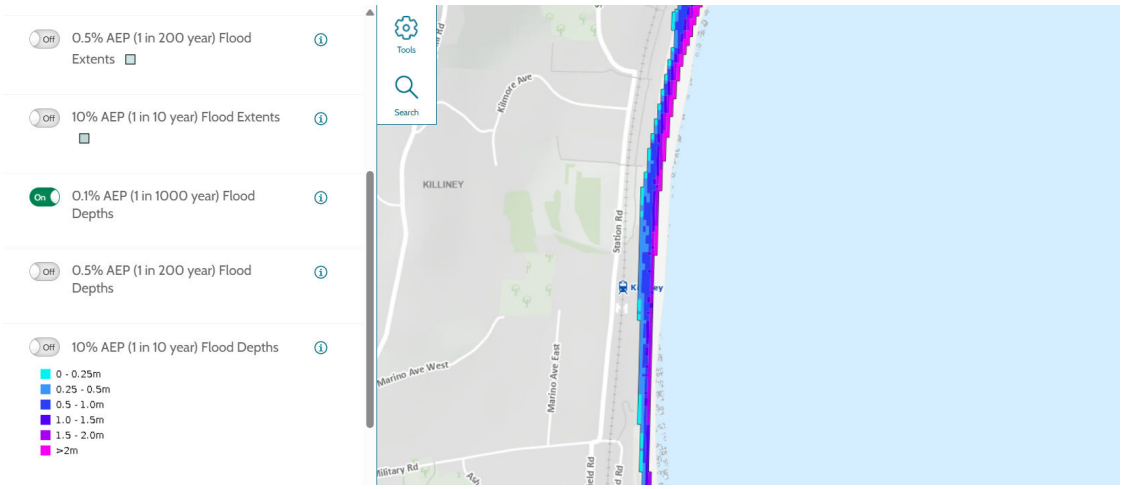
5. SITE FLOOD RISK

5.1 Flood Risk

The site is located outside the 0.1% AEP fluvial & pluvial flood events. From and inspection of coastal flooding extents and intensity, the site falls outside the 1:1000 year events



CFRAM extract from floodinfo.ie for 0.1AEP coastal flooding extents. Note: Green shaded pattern all to east side of railway.



CFRAM extract from floodinfo.ie for 0.1AEP coastal flooding Depths. Note: Blue and pink shaded pattern all to east side of railway.

Signed:_____ Date: 20/10/2026

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Appendix

Calculations Spreadsheet

KILLINEY FAILTE IRELAND: Service Report Calculations Proposes

David Maher & Associates Oct-26

Location	Location	Area	Floor Height	WC	WHB	SHOWER	KITCHEN/ UTILITY SINK	URINAL
Unisex Toilet	Existing Block			8.00	8	0	0	0
New Changing Area	New Block			4.00	4.00	5.00	1.00	
Total		-	-	12.00	12.00	5.00	1.00	- - - - -

Floor Level	Room/Apart Number	Apart Areas Total	Flr Height	WC Total	WHB Total	SHOWER	KITCHEN SINK	URINAL

Unit Type	Number of Units		Discharge (l/s)	Total (l/s)
WC Total (6 litre cistern):		12.00	2	24.00
WHB Total:		12.00	0.5	6.00
Urinal			0.8	
Showers Total:		5.00	0.6	3.00
Kitchen Sinks Total:		1.00	0.8	0.80
Sum of Discharge Units				33.80

Foul Water Peak Discharge Qwwtot= 2.6 l/sec from formula (Note assumes Kfactor=0.5 for dweilling, guesthouse, apartments, restaurant, kitchen and semi-public wcs and whbs,)
kfactor=1 for frequent use gym shower kfactor= 1 for frequent use assumed Qww= K * (DU)^0.5
5.81L/s

Source: Clause 6.3 Calculation of Flowrate: IS EN 12056:2000 Gravity Drainage Systems Inside Buildings: Part 2: Sanitary Pipework Layout & Calculation.

Average Foul Discharge Rate from 500 visitors 10 litres/ person/ day per visitor:

Number of visitors per day	500			
Visitor Discharge per Day:		5000		
Average Foul Discharge Rate from Staff	60	litres/ person/ day per visitor:		
Number of Staff per day	5			
Staff Foul Discharge per Day:		300	litres/day	Source: EPA Wastewater Treatment Manual: Business, Leisure Centres & Hotels
Total Discharge Rate per day		5300	litres/day	
Average Foul Discharge/second		0.06134259	litres/second	

Summary

Foul Water Summary:	Average Foul Discharge From Site:	0.06134259	litres/second	
	Peak Flow Foul Discharge From Site:	5.81L/s	litres/second	(need to calculate manually from formula in red)