



PAMES
DEVELOPMENTS LIMITED

Office

Retail

Residential

Industrial

DRAINAGE REPORT
FOR
RESIDENTIAL DEVELOPMENT
AT
HILLVIEW,
DISPENSARY LANE,
LUCAN,
Co. DUBLIN.

February 2022

1.0 Introduction:

The proposed development is for a small residential development comprising of 3 no. dwellings on a 0.0569 ha site located to the east of the Main Street on Dispensary Lane, Lucan.

Along the northern boundary of the proposed site there is a green field set in grass. To the east of the proposed site is the Lucan Health Centre. To the west of the proposed site there is a detached Eircom building. The proposed site is bound to the south by Dispensary lane.

The proposed site has a gentle sloping topography.

In relation to the above project, please find the enclosed drawings and calculations detailing the proposed drainage arrangements, a summary of which are outlined below.

2.0 Foul Drainage:

Foul water drainage from the site is to comply with the Code of Practice for Drainage works and the Greater Dublin Strategic Drainage Study (GSDSDS). The foul water system for the proposed development will be separate to the surface water drainage system. All foul drainage from the proposed development will discharge by gravity and there is no requirement for foul pumping within the development. Foul water from each dwelling will be collected separately with each sewer line having its own inspection chamber before leaving the property. Each foul sewer will then run to an outfall manhole located in the front left corner of the site prior to entering a proposed new 150mm diameter gravity foul sewer, as per the requirements of the GSDSDS, that will connect the development to the existing 225mm diameter foul drainage sewer located along Dispensary Lane.

Based on the calculated potable water demand for the development, the foul effluent discharge is estimated to equate to a DWF of 0.042 litres per second giving a max flow (6 DWF) of 0.250 litres per second. This flow is based on a water demand of 200 liters per person per day and 6.0 persons per house.

See Table 3 in Appendix B for details of this calculation.

The design detail of the connections to the public sewer will be agreed with Irish Water and South Dublin County Council prior to the commencement of construction.

3.0 Surface Water Drainage:

Surface water drainage from the site is to comply with the SDCC Code of Practice for Drainage works and the Greater Dublin Strategic Drainage Study (GSDSDS). The proposed development will increase the impermeable area within the site and hence the surface water run-off from the site.

The surface water drainage for the proposed development will be separate from the foul drainage. It is proposed that the development will drain via gravity and discharge at a restricted rate to the existing 300mm diameter surface water drainage sewer located along Dispensary Lane.

Permeable paving is proposed for surfacing of all private carparking areas, providing a primary level of treatment from runoff from parked cars. It is noted that the permeable paved areas will result in a small increased time of entry for the surface car park areas thereby further improving capacity availability with the drainage system.

The stormwater drainage on the site will be attenuated in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS). This limits the discharge from the site to the Greenfield Runoff rate for the undeveloped site. Based on a site area of 569sqm and a total hard standing area of 267sqm, the Greenfield Runoff rate is calculated to be 1.98 liters/sec/ha. This figure is then factored up for the 100-year rate using the 100-year growth curve factor of 2.6 to give a rate of 5.14 liters/sec/ha or 0.29 liters/sec in accordance with the GSDSDS. This 0.29 liters/sec flow rate is smaller than the minimum flow achievable through the proposed Hydrobrake flow control device of 2.0 liters/sec which would also reduce the risk of blockage in the Hydrobrake. Based on these runoff rates, there is a requirement to limit the discharge from the site to 2.0 litres per second (35.1 litres/sec/ha) for the 100 year storm and to provide storage on site of approximately 4.3m³ for this 100 year storm. Allowing for climate change an additional 20% storage volume (0.9m³) will be provided bringing the total volume of storage up to 5.2m³. It is intended to limit the discharge from site to this flow rate by the use of a hydrobrake and to provide the storage in three separate min. 1.8m³ Stormcell attenuation tanks or similar approved (one for each dwelling) located in the rear gardens of each property.

See Appendix A for all surface water Greenfield Runoff discharge and attenuation calculations.

The design detail of the connections to the public sewer will be agreed with South Dublin County Council prior to the commencement of construction.

4.0 Water Supply:

It is proposed to provide potable water for the development via 3 no. separate connections (one for each dwelling) to an existing 180mm diameter HPPE watermain running along Dispensary Lane to the south of the subject site. The proposed watermain connections will be 25mm diameter HDPE in accordance with Irish Water Specifications and to Is EN 12201.

There is an existing hydrant within the public footpath to the front of the site ensuring that all the dwellings are within 45m of a hydrant.

The estimated daily potable water demand for the proposed development is 3.6m³/day. This flow is based on a water demand of 200 liters per person per day and 6.0 persons per house. The peak demand for the proposed development is estimated to be 0.167 litres/sec (4 DWF).

See Table 3 in Appendix B attached showing water demand calculations.

5.0 Flood Risk Assessment:

The CFRAM map for the Lucan to Chapelizod Fluvial Flood Extents was reviewed on the OPW website. This map indicates no flooding on the subject site. The nearest node on the map to the site, 09GRIF00029E, recorded a flood water level of +24.05m OD Malin which is in the 0.1% AEP flood zone. The subject site, with the ground floor levels of each of the proposed dwellings set at +25.150m OD Malin is approx. 1.1m above the flood level.

There is no flood route between the development and the Griffeen River which runs through Lucan and therefore there is an extremely low risk of flooding of the proposed development.

Our assessment concluded that the site of the proposed development is not subject to flooding.

APPENDIX A

GREENFIELD RUNOFF CALCULATION

PROJECT	RESIDENTIAL DEVELOPMENT AT HILLVIEW, DISPENSARY LANE, LUCAN
CLIENT	JOHN POPE
DATE	21.02.2022
ENGINEER	TC

QBAR (rural) = 0.00108*(AREA^{0.89})*(SAAR^{1.17})*(SOIL^{2.17})

Area (sqm)	500000
SAAR (mm per year)	750
soil class	0.3
QBAR rural (l/s)	98.8
QBAR rural (l/s/ha)	2.0

Area of Site (sqm)	569	linerially interpolate
Qbar (l/s)	0.11	
Qbar (l/s/ha)	1.98	

return period years	growth curve factor	discharge rates (l/s/ha)	discharge rates (l/sec)
1 year factor	0.85	1.68	0.10
30 year factor	2.10	4.15	0.24
100 year factor	2.60	5.14	0.29

soil classification	wrap	runoff	soil value	soil characteristics
1	very high	very low	0.15	sandy, well drained
2	high	low	0.3	intermediate soils (sandy)
3	moderate	moderate	0.4	intermediate soils (silty)
4	low	high	0.45	clayey, poorly drained
5	very low	very high	0.5	steep rocky areas

WRAP winter rain acceptance parameter

TABLE 1: GREENFIELD RUNOFF CALCULATION IN ACCORDANCE WITH THE GREATER DUBLIN STRATEGIC DRAINAGE STUDY.

PROJECT				RESIDENTIAL DEVELOPMENT AT HILLVIEW, DISPENSARY LANE, LUCAN.			
CLIENT				JOHN POPE.			
DATE				21.02.2022.			
ENGINEER				TC			
		return period (yrs)				100	
		area of site (m2)				569	
		% runoff from paved areas				46.92	
		amount off site per hectare (l/s/ha)				35.1	
		Area of hard landscaping (m2)				267	
		amount off site (l/s)				2.00	
duration	rainfall (mm)	amount (l)	amount off site (l)	storage required (l)			
15m	23.00	6140	1797	4343			
30m	29.00	7742	3595	4147			
1hr	36.00	9611	7190	2421			
2hr	44.00	11747	14380	-2633			
4hr	53.00	14150	28760	-14610			
6hr	62.00	16552	43139	-26587			
12hr	75.00	20023	86279	-66255			
24hr	89.00	23761	172557	-148796			
48hr	105.00	28032	345114	-317082			
Max. Volume of Storage Required in Cubic Meters				4.3			
20% Increase for Climate Change Factor				0.9			
Overall Volume of Storage Required in Cubic Meters				5.2			

TABLE 2: ATTENUATION VOLUME CALCULATION FOR A 100 YEAR RETURN PERIOD BASED ON A 100 YEAR THROTTLE RATE.

APPENDIX B

INPUT HOUSES	6 PERSONS PER HOUSE 200 LITRES PER PERSON PER 24 HOUR DAY 120 m ² PER HOUSE
APARTMENTS	2.5 PERSONS PER APARTMENT 200 LITRES PER PERSON PER 24 HOUR DAY
COMMERCIAL	8 m ² PER PERSON 45 LITRES PER PERSON PER 12 HOUR DAY 100% OCCUPANCY RATE OF GROSS AREA(100% IF NET AREA USED)
RETAIL	360 LITRES PER PERSON PER 12 HOUR DAY FOR SMALL UNITS(2 WHB & 1 WC) 10000 LITRES PER PERSON PER 12 HOUR DAY

TABLE 5.5.4.1

Calculation of the foul discharge and water requirements.

ZONE	BLOCK	TOTAL No. OF HOUSES	TOTAL No. OF APARTMENTS	RETAIL AREA (m ²)	COMMERCIAL AREA (m ²)	No. OF OCCUPANTS	TOTAL DAILY WATER USAGE (l/day)	D.W.F. (l/s)	6 TIMES D.W.F. (l/s)	PEAK DAILY WATER DEMAND (l/s)
		3	0	0	0	18	3600	0.042	0.250	0.167
		0	0	0	0	0	0	0.000	0.000	0.000
		0	0	0	0	0	0	0.000	0.000	0.000
		0	0	0	0	0	0	0.000	0.000	0.000
TOTAL		3	0	0	0	18	3600	0.042	0.250	0.167

NOTES:

- GENERAL OCCUPANCY LEVELS FOR THE VARIOUS BUILDINGS

HOUSES	6 PERSONS PER 120m ² 4 BED HOUSE	200 LITRES/PERSON/DAY BASED ON A 24 HOUR DAY
APARTMENTS	2.5 PERSONS PER APARTMENT	300 LITRES/PERSON/DAY BASED ON A 24 HOUR DAY
OFFICES	1 PERSON PER 8 m ² OF OFFICE AREA(85% OCCUPANCY RATE)	45 LITRES/PERSON/DAY BASED ON A 12 HOUR DAY
RETAIL		10 000 LITRES/HECTARE/DAY OR 360 LITRES/DAY/UNIT (2 WHB & 1 TOILET) FOR SMALL UNITS BASED ON A 12 HOUR DAY
- THE PEAK WATER DEMAND IS CALCULATED AS 4 TIMES THE AVERAGE
- ALL SEWERS ARE DESIGNED FOR 6 TIMES DRY WEATHER FLOW (DMWF)
- FOR FIRE FIGHTING PURPOSES THE DEVELOPMENT IS CLASSED AS A CLASS 3 DEVELOPMENT WITH A REQUIREMENT OF 1800 TO 2250 LITRES PER MINUTE

TABLE 4: FOUL WATER DISCHARGE DESIGN AND WATER REQUIREMENTS.