
DOCUMENT TITLE

**ENGINEER
DRAINAGE
REPORT**

**2 No. Houses &
Associated Car
Parking
at Blackhill
Crescent,
Donacarney,
County Meath.**

CLIENT
Meath County Council

PROJECT NO. 5514(01)

REVISION	DATE
1.0	12/11/2021

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Revision History					
Rev	Date	By	Chk	App	Description
1.0	12.11.2021	N I	RM		Issue for Planning

Disclaimer:

This report has been prepared by McCrae Consulting Engineers, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client, and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.



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2. INTRODUCTION

The site is located near the end of Blackhill Crescent, a well-established residential area, circa 100 meters northeast of the centre of Donacarney village, 5km east of Drogheda town centre and 2.5km northwest of Bettystown. Donacarney lies about 1.3km south of the Boyne estuary and 2km inland from the coast at Bettystown golf course. The site lies about 18m above mean sea level. A site location map is shown in figure 1 in appendix A.

The site is currently a greenfield and it is proposed the development will consist of 2 new single storey homes along with 4 car parking spaces. Refer to figure 2 in appendix A.

The site is approximately 1740 m² in area, and is reasonably flat, refer survey drawing 5514 (01) -MCE-DY-XX-DR-C-0002-P1 Site Location and Existing Services Layouts enclosed.

3. SCOPE

This report outlines the proposals for foul and surface water drainage of the new house and the watermain supply. These proposals are illustrated on the following enclosed drawings:

- 5514(01)-MCE-DY-XX-DR-C-0003-P1 – Proposed Foul Sewer Layout
- 5514(01)-MCE-DY-XX-DR-C-0004-P1 – Proposed Storm Drainage Layout
- 5514(01)-MCE-DY-XX-DR-C-0005-P1 – Proposed Watermain Layout

4. EXISTING DRAINAGE

Presently there is no separation of foul and surface water on or adjacent to this site.

The existing drainage near the site consists of a combined sewer which flows west to east across the site. According to the Irish Water record drawing this is a 450mm diameter combined sewer located under the end houses of the adjacent cul-de-sac, however the survey drawing indicates a 300mm diameter located on the site. We have assumed the survey drawing to be the correct size and location of this sewer. Refer fig 3 in appendix A which illustrates the current Irish Water record drawing for the area of the site, survey drawing 5514 (01) -MCE-DY-XX-DR-C-0002-P1 Site Location and Existing Services Layouts enclosed.

5. FOUL DRAINAGE

A preliminary application to Irish Water for a water main connection has been made for this development and is currently being reviewed by them. The drainage for the new houses will be a fully separated foul and surface water sewer system. The new separate foul sewer is illustrated on drawing 5514(01)-MCE-DY-XX-DR-C-0003-P1 – Proposed Foul Sewer Layout enclosed with this report.

The foul drainage from the two houses is collected in a new foul sewer on the Blackhill Crescent Road and deposited, via gravity, directly into this existing combined sewer which flows off in an easterly direction.

It is proposed to install a new manhole on the existing combine sewer where the new foul sewer connects into it. Design calculations for the foul outflow are in Appendix C.

6. SURFACE WATER DRAINAGE

The drainage for the new houses will be a fully separated foul and surface water sewer system. The new separate storm water sewer is illustrated on drawing 5514(01)-MCE-DY-XX-DR-C-0004-P1 – Proposed Storm Water Sewer Layout enclosed with this report.

Ground Investigations Ireland (GII) were engaged to carry out a site investigation on the site which included an infiltration test. The results of this infiltration test are contained in the final GII report. The summary / conclusion of this report indicates the following:

“At the locations of SA01 the water level dropped too slowly to allow calculation of ‘f’ the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.”

As this report conclusion indicates the infiltration test has shown that infiltration is not a feasible solution on this site.

As the run-off from the development is so small it is not practical to attenuate the flow as the orifice required would be so small it would be at risk of blockage.

Therefore, we have detailed the stormwater run-off from the roofs of the two houses being deposited into the combined sewer via an infiltration pit. Whilst the site investigation concluded that the ground is not suitable for soakaway design some small amount of the run-off will infiltrate into the surrounding ground as it passes through the infiltration pit. This infiltration has been indicated as large as it

possibly within the rear garden of one of the houses as this is the only place on the site that it is possible to locate an infiltration pit, given the presence of various existing services on the western side of the site.

The new car parking bay will all be constructed in permeable paving, run-off from the very small new section of road (accessing two of the parking bays) will deposit into the parking bays.

7. WATERMAIN

A preliminary application to Irish Water for a water main connection has been made for this development and is currently being reviewed by them.

There is existing 100mm diameter water supply running north-south through the site. For potable water it is proposed to connect the development to both this existing watermain.

The proposed new watermain to service the new houses will be a 100mm watermain will be looped as per Irish Water Code of Practice. Water demand is 150 l/person/day. For firefighting purposes, a fire hydrant is to be provided on the new watermain servicing the houses to the spacing required by Part B of the Building Regulations including the requirement that hydrants will be provided such that no part of the building elevation shall be 46m from a hydrant. Design calculations for watermain supply are in Appendix C.

Water supply to the buildings will be by means of 50mm diameter spur from the proposed 100mm external watermain. Minimum 24-hour storage capacity is to be provided for mains water within buildings by way of high-level attic storage tanks.

8. SuDS

A SuDS site drainage evaluation was undertaken to establish which if any SuDS measures could be implemented on the site. Of these measures the following measures were considered:

1. It was not deemed practical to incorporate a **green roof** on the houses as the roofs are all pitched.
2. Whilst the site investigation found that the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate, we have included an **infiltration pit** on the line of the storm water outfall pipe to the existing

combined sewer. Whilst it will not infiltrate the entire stormwater run-off it will facilitate the infiltration of some extent of the run-off and hence reduce the volume entering the combined sewer.

3. The only public open grassed area is located on the western side of the site which is very slightly more elevated. All there are trees and services in this area, therefore, it is not practical to collect the stormwater run-off from the houses and deposit it to a **swale** in this grassed area.
4. All areas within the curtilage of the houses are either grass or **permeable paving** to reduce the run-off entering the stormwater sewer. Also, all new car parking bays are to be permeable paving.

9. FLOODING

McCrae Consulting Engineers (MCE) has prepared a site-specific Flood Risk Assessment (FRA) to assess the proposal to develop the 2 houses on this site adjacent on Blackhill Crescent, Donacarney, Co Meath with respect to the requirements of **The Planning System and Flood Risk Management** (PSFRM) guidelines published by the Department of Environment, Heritage and Local Government in November 2009.

A copy of the FRA is contained in Appendix B.

Regards,

A handwritten signature in purple ink that reads 'Norman Irvine'.

Norman Irvine
Chartered Engineer
B.Eng.; Pg. Dip. SHWW; M.I.E.I.



10. APPENDIX A

Layouts



Fig 1: Site Location

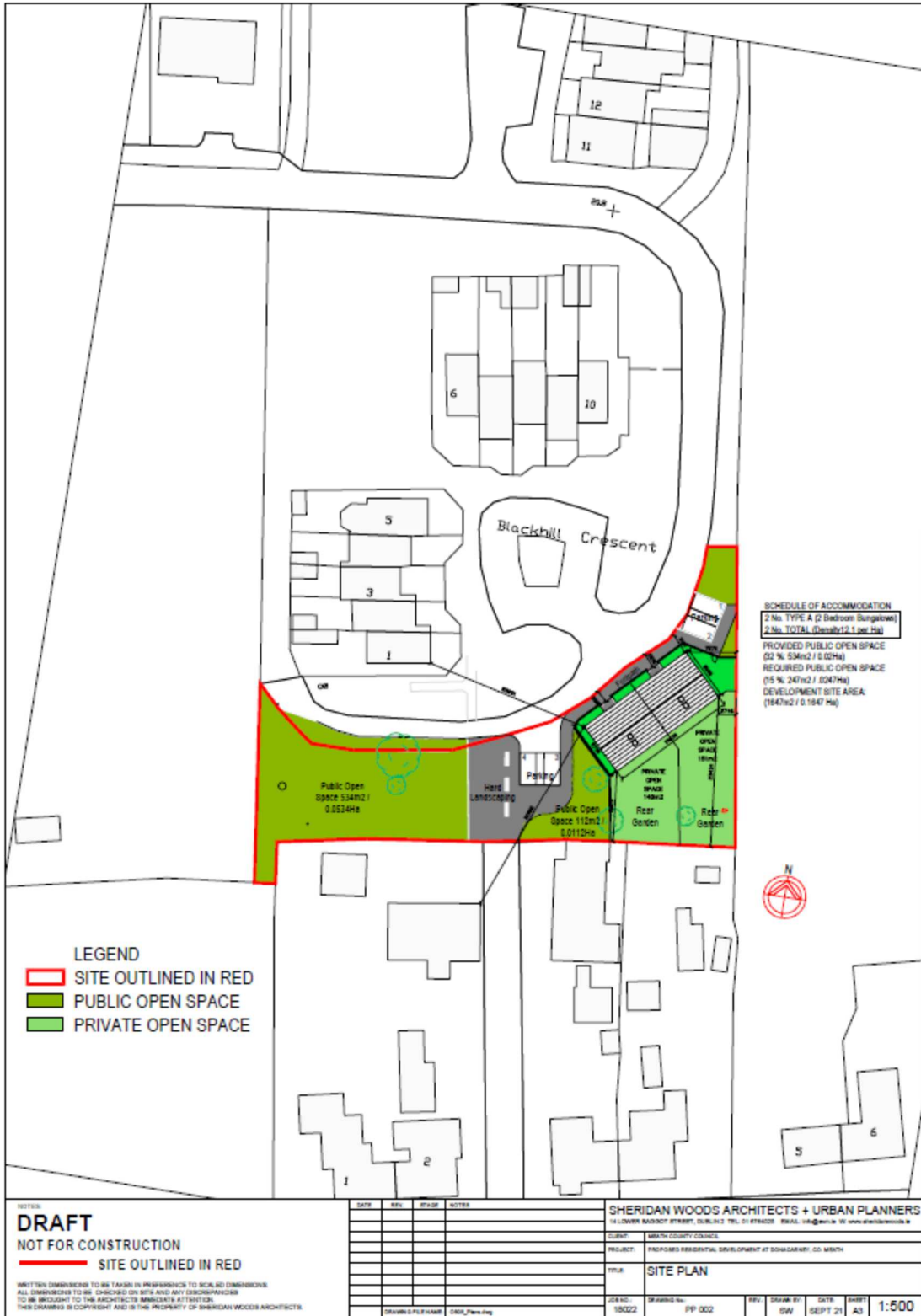


Fig 2: Proposed Site Layout

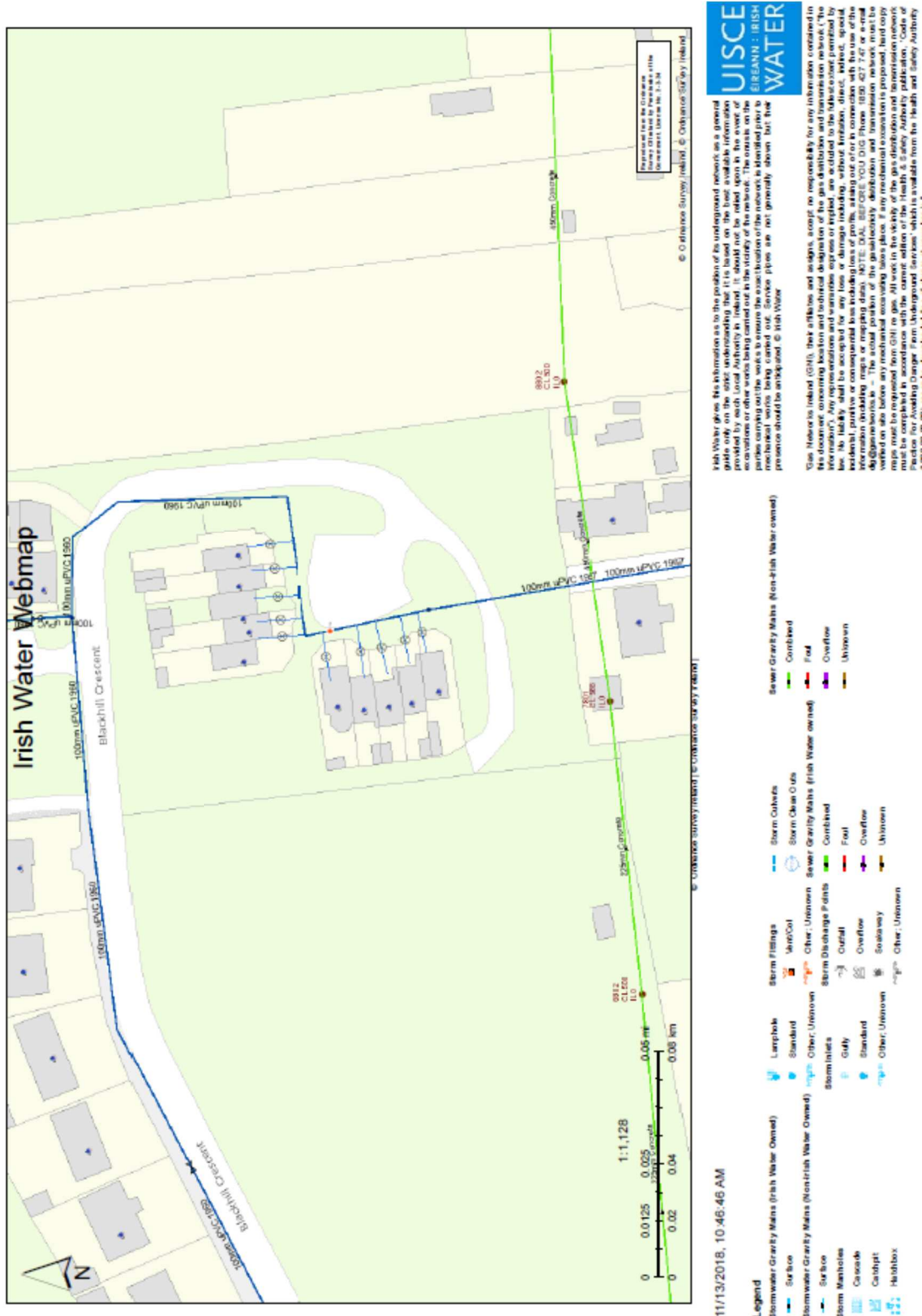


Fig 3: Existing Drainage & Watermain Layouts



11. APPENDIX B

FLOOD RISK ASSESSMENT

(attached)



12. APPENDIX C

FOUL AND WATER SUPPLY CALCULATIONS

Design of Foul Sewer Discharge Based on IS EN 12056-2 Discharge Unit Method

FOUL DRAINAGE DESIGN	
FMH 01-02 -03	
Project	Donacarney
Project No	5514
Date	12/11/2021
Revision	A
Code	IS EN 12056-2

House Type B3			
Appliance	No	DU	Total
WCs	1	2	2
Wash basin	1	0.5	0.5
Showers	1	0.6	0.6
Bath	1	0.8	0.8
Kitchen sink	1	0.8	0.8
Dishwasher	1	0.8	0.8
Washing machine	1	0.8	0.8
Total			6.3

Sum of Discharge Units for 2 Houses			
	No.	DU	Total DU
House Type B3	2	6.3	12.6
ΣDU			12.6

Flow Calculation		
$Q_{sew} =$	$KV\Sigma DU$	l/s
$K =$	0.5	Frequency factor
$Q_{sew} =$	1.77	l/s

Table 2: Discharge Units (DU)

Appliance	System I	System II	System III	System IV
	DU l/s	DU l/s	DU l/s	DU l/s
Wash Basin, Bidet	0.5	0.3	0.3	0.3
Shower without Plug	0.6	0.4	0.4	0.4
Shower with Plug	0.8	0.5	1.3	0.5
Single Urinal with Cistern	0.8	0.5	0.4	0.5
Urinal with Flushing Valve	0.5	0.3	-	0.3
Slab Urinal	0.2*	0.2*	0.2*	0.2*
Bath	0.8	0.6	1.3	0.5
Kitchen Sink	0.8	0.6	1.3	0.5
Dishwasher (Household)	0.8	0.6	0.2	0.5
Washing Machine up to 6 kg	0.8	0.6	0.6	0.5
Washing Machine up to 12 kg	1.5	1.2	1.2	1.0
WC with 4.0 l Cistern	**	1.8	**	**
WC with 6.0 l Cistern	2.0	1.8	1.2 to 1.7***	2.0
WC with 7.5 l Cistern	2.0	1.8	1.4 to 1.8***	2.0
WC with 9.0 l Cistern	2.5	2.0	1.6 to 2.0***	2.5
Floor Gully DN 50	0.8	0.9	-	0.6
Floor Gully DN 75	1.5	0.9	-	1.0
Floor Gully DN 100	2.0	1.2	-	1.3

* per person
 ** not permitted
 *** depending upon type (valid for WC's with siphon flush cistern only)
 - not used or no data

Table 3: Typical frequency factors (K)

Usage of appliances	K
intermittent use e.g. in Dwelling, Guesthouse, Office	0.5
frequent use e.g. in Hospital, School, Restaurant, Hotel	0.7
congested use e.g. in Toilets and/or Showers open to Public	1.0
special use e.g. Laboratory	1.2

				Project	Donacarney		
				Subject	Water Demand Calculation		
Job No:	5514(01)	Date:	12/11/2021	By:	NI		Page: 1
Design Information							
Water demand calculation for new residential units in accordance with IW Water Infrastructure Code of Practice							
<u>Average daily domestic demand</u>							
No of units 2							
Per capita consumption 150 l/person/day							
Occupancy ratio 2.7 persons/unit							
Average daily demand = 810 l/day 0.009 l/s							
Peak Water demand 1.25 * average daily demand							
Peak water demand = 1012.5 l/day 0.012 l/s							
<u>Water Storage Calculations</u>							
No of units 2							
Water storage requirement per unit 227 l							
Total water storage requirement 454 l							