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Project Title: No. 101 Muckross Ave., Perrystown, D.12

Report Title: Provision of Additional Information at the request of the Land Use, Planning & Transportation Department of South Dublin County Council.

Report Ref: 21282-LDE-ZZ-00-RP-1C01_ESR

Project Ref: 21282

Register Ref: SD21B/0534

Client: Ciarán & Michelle Kavanagh

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1.0 Introduction:

The purpose of this report is to address the additional information outlined by the Land Use, Planning & Transportation Department of South Dublin County Council to design the additional drainage required to facilitate the proposed front and rear extensions to No. 101 Muckcross Avenue, Perrystown, Dublin 12.

Planning Register Reference: SD21B/0534.

1.1 Required Additional Information:

2. The Drainage and Water Services Section of South Dublin County Council have assessed the proposal and have requested the following Additional Information:

(a) The applicant has not submitted surface water drainage plans for the proposed development. The applicant is requested to submit a drawing showing existing and proposed surface water drainage layouts up to and including the point of connection to the public surface water sewer. The drawing shall include the location of all Aj's, manholes, pipe size, material type and direction of flow. The drawing shall clearly show that the foul and surface water systems are discharging to separate pipe networks.

(b) There does not appear to be any SuDS proposed (Sustainable Drainage Systems). The applicant is requested to submit a drawing to show what SuDS are proposed. Examples of SuDS include green roofs, blue roofs, permeable paving, filter drains, water butts and other such SuDS.

3. Irish Water has assessed the proposal and has requested the following Additional Information:

(a) The applicant has not submitted water supply drawings for the proposed development. The Applicant is requested to submit a drawing in plan outlining the existing and proposed water supply layout for the development.

(b) The applicant has not submitted foul water drainage plans for the proposed development. The Applicant is requested to submit a drawing showing the existing and proposed foul water drainage layouts up to and including the point of connection to the public foul water sewer. The drawing shall include the location of all Aj's, manholes, pipe size, material type and direction of flow. The drawing shall clearly show that the foul and surface water systems are discharging to separate pipe networks.

2.0 Site Location:

The dwelling is part of a 4 No. house terrace on Muckross Avenue, in Perrystown, Dublin 12. The site boundary of the property is marked with a red border in the image below.

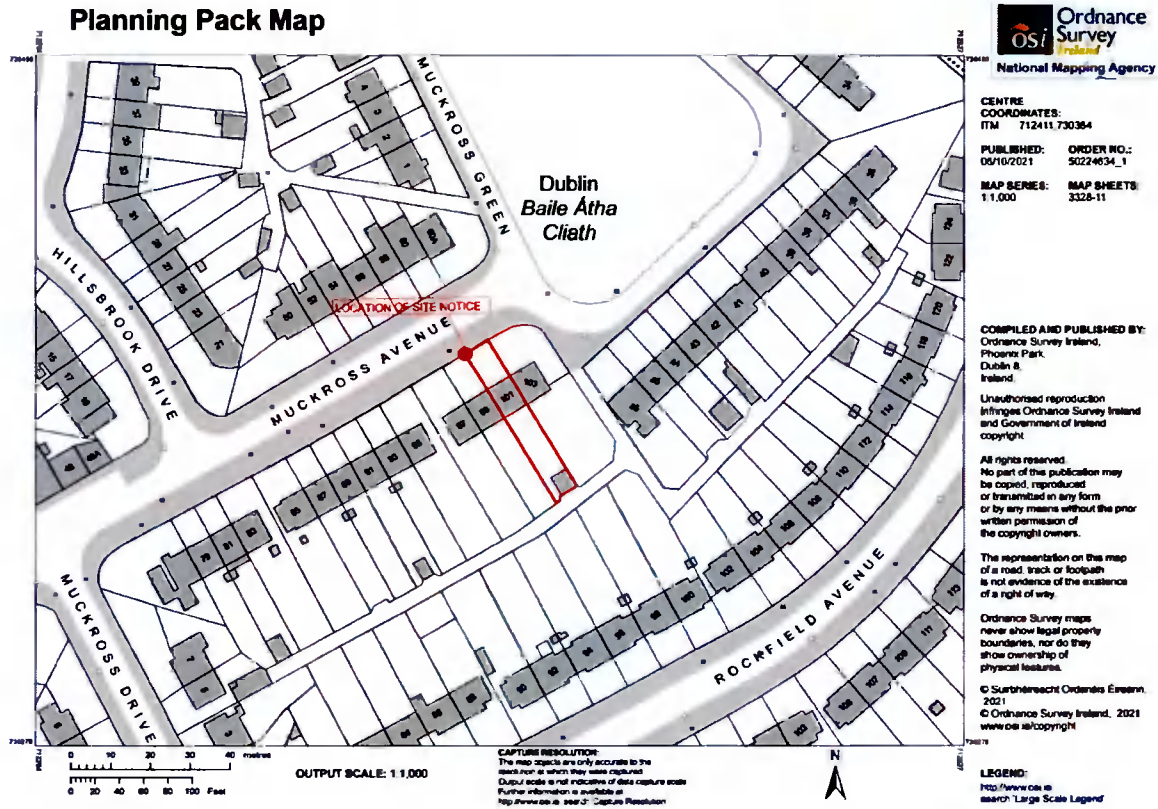


Image 1 - Site Location

3.0 Existing Drainage:

3.1 Public Surface Water Sewer:

There is a 225mm diameter public surface water sewer to the front of the property running from left to right.

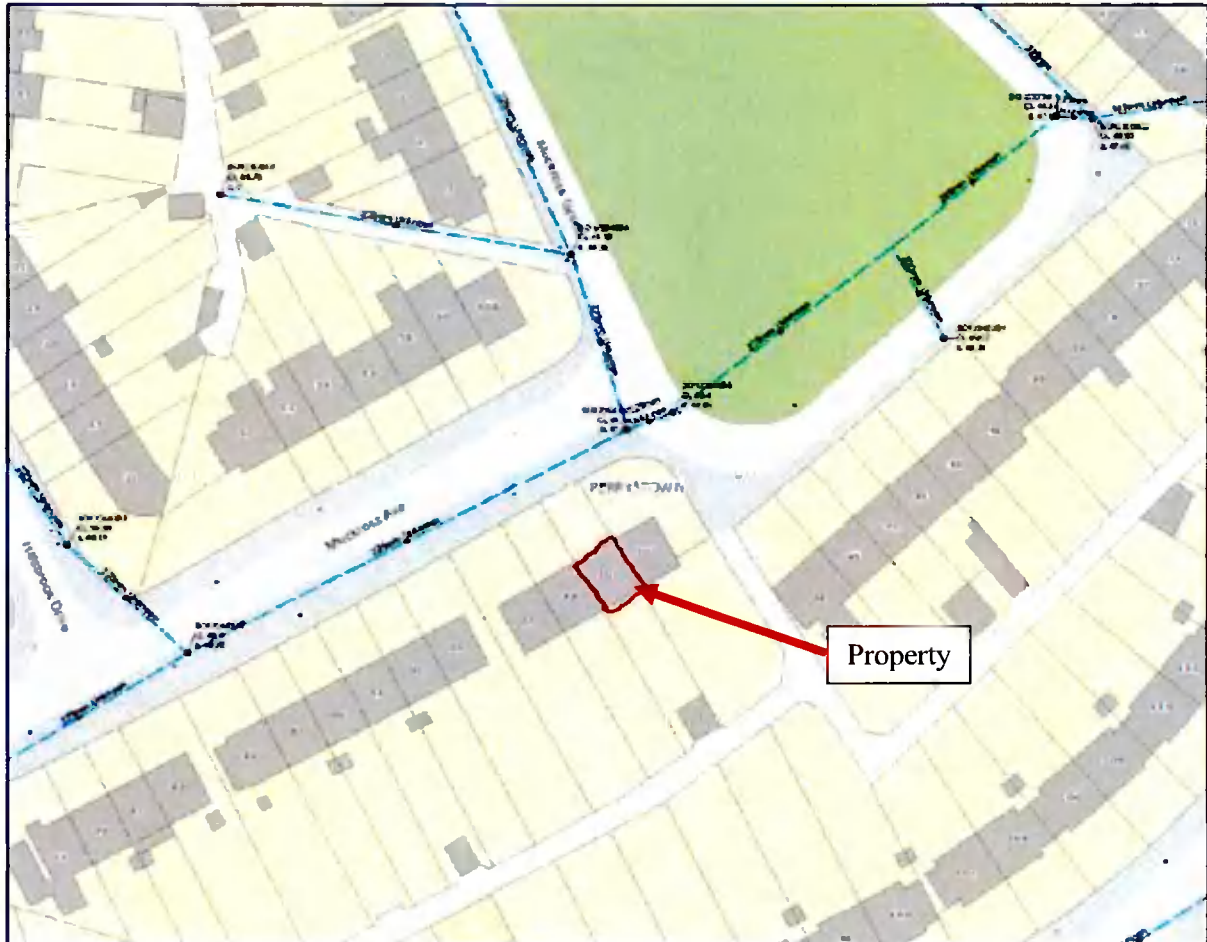


Image 2 - Public Surface Water Sewer

3.2 Public Foul Water Sewer:

There is a 225mm diameter public foul water sewer to the front of the property running from left to right.

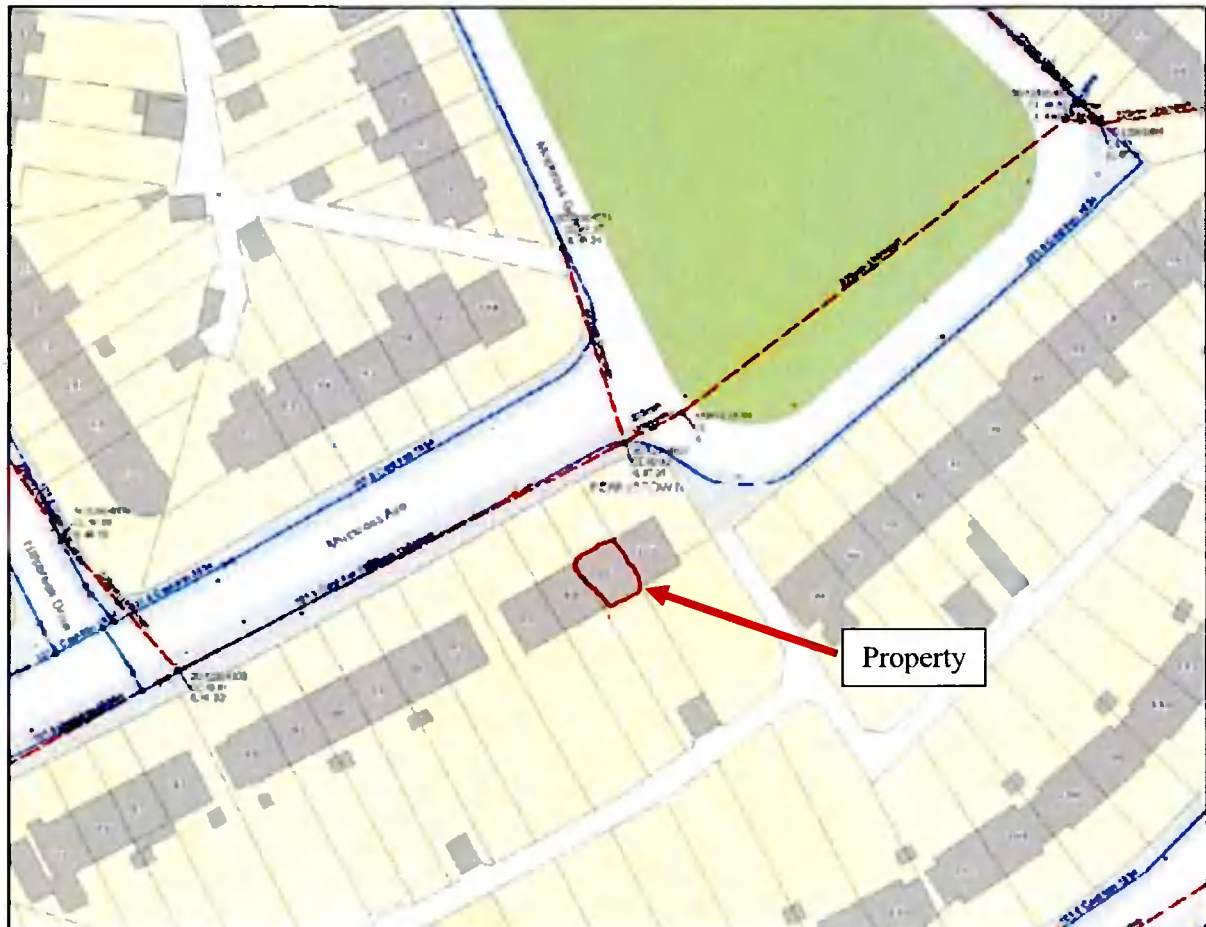


Image 3 - Public Foul Water Sewer (Red Line)

3.3 Private Surface Water Drainage:

The existing surface water is currently brought to the front and rear ends of the terraced dwellings to a rainwater downpipe and is then brought out to the road, and connected to the public surface water sewer. There are no rainwater downpipes on the property of No. 101 Muckcross Avenue, to the front or the rear.



Image 4 - Private Surface Water Drainage

3.4 Private Foul Water Drainage:

After inspection of the site, 1 No. 150mm diameter Foul Water drain was found running parallel to the rear of the dwelling through the rear gardens of the terraced dwellings, 1200mm out from the back wall. There is no evidence of a Surface water drain along this line.

The existing Foul water drainage for the WCs on first floor level is directed out the rear wall and dropped to an Access Junction at the bottom step of the back door.



Image 5 – Private Foul Water Drainage

4.0 Proposed Drainage:

4.1 SuDS

4.1.1 Blue Roof

A blue roof could be used to attenuate the surface water that is produced due to the front and rear extensions. However, much of the rear extension is sloped towards the boundary line of No. 103 Muck Avenue, and is unsuitable for a blue roof. The remaining 21m² flat roof area of the rear extension is suited to accommodate a blue roof, but the area is so small that the required attenuation volume is just 0.034m³, including 20% increase for climate change. The flow rate for this roof would be 0.205 l/s for a 1-hour storm duration for a 100-year storm return period, which is considerably less than the design attenuated flow rate of 1.0 l/s. (See Appendix 6.1). The slow flowrate likely makes the blue roof more susceptible to blockages. For the above reasons, the blue roof design is not a justifiable solution.

4.1.2 Soakaway

As per BRE Digest 365, soakaways require a clearance of 5.0 metres to building foundations and 3.0 metres from a boundary wall, which can be achieved with a narrow soakaway of 1.0 metre width. The soil infiltration rate on the site is 1.55×10^{-5} m/s. The roof areas of the front and rear extensions are to be drained and have a combined area of 44m². Accounting for a critical storm return period of 100 years and a modification factor due to climate change of 1.2, a soakaway of volume capacity 3.52m³ would be required. The preliminary dimensions of the soakaway would be 4.4m x 1.0m x 0.8m deep. (See Appendix 6.2).

4.2 Proposed Connection

Please refer to Drawings 21282-LDE-ZZ-00-DR-1C01 in conjunction with the design proposal.

4.2.1 Foul Water

The domestic foul water drainage shall be brought to Access Junctions to the exterior of the rear extension, in three separate 150mm diameter *Wavin* pipes. The ground floor WC foul water is to be brought to AJ1. The ground floor kitchen utilities foul water is to be brought to AJ1 also. The redirected first floor WC foul water is to be brought to AJ2. These will be connected to AJ3, and from here will flow at an angle and saddle onto the existing 150mm diameter foul water sewer which runs parallel to the existing terraced dwellings. At the end of the terrace the private Foul Water drain runs toward the road of Muckcross Avenue where it connects with the existing 225mm public Foul Water Sewer.

4.2.2 Surface Water

It was accepted that the most suitable method of SuDS for the surface water was a soakaway. The rear roof extension area will be drained to a downpipe adjacent to the Boundary Wall with No. 103 Muckcross Avenue and flow to AJ6 in a 150mm diameter *Wavin* pipe. From here the surface water will drain to the 4.4m x 1.0m x 0.8m deep soakaway.

The surface water from the front extension (9m²) will be drained to a downpipe and flow to AJ4 and then AJ5 in a 150mm diameter *Wavin* pipe. From here the surface water will drain underneath the dwelling in a new 150mm diameter *Wavin* pipe to join with AJ6 and continue to the soakaway.

5.0 Conclusion

The proposed Foul Water connections account for the WC at ground level, utilities, kitchen appliances and WC at first floor level. These drains connect to Access Junctions out beyond the extent of the building so they are more accessible. Multiple AJs are used in order to alleviate flow into the existing private Foul Drain.

Due to the limited volume of surface water that has to be drained (44m²) for from the proposed single storey extensions, a soakaway is the most suitable method of SuDS. For the reason outlined before blue roof design is not a justifiable solution. The soakaway will be positioned centrally in the garden in accordance with BRE Digest 365.

As requested in the additional information, the Foul and Surface Water systems are discharging into separate pipe networks.

Rossalynch


Mr. Rossa Lynch

Date: 28/01/2022

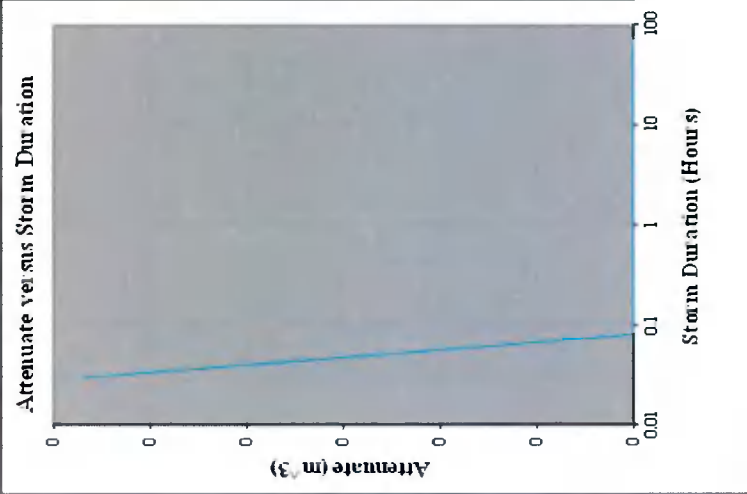
For Lohan & Donnelly Civil & Structural Consulting Engineers.

6.0 Appendix – Civil Drawings


6.1 Blue Roof Calculation Sheet

 LOHAN & DONNELLY Consulting Engineers <small>13 Gardiner Place, Mountjoy Square, Dublin 1. T: 01 8787770 W: www.lohan-donnelly.com E: info@lohan-donnelly.com</small>		Project: 101 Muckross Avenue, Perrystown, Dublin 12.		Job No: 21282	
		Date: 20.12.2021		Page No: 1	
Roof Area: 21 m ²		Paved Area: 0 m ²		Checked by: FM	
I Factor: 1.00		I Factor: 1.00		Attenuated Flow Rate: 1 l/s	
Rainfall: 1.00		Other: 1.00		Equivalent Impermeable Area: 21 m ²	
Storm Duration (Hours)		Rainfall (mm)		Allowable Discharge (m ³)	
Total Surface Water (m ³)		Attenuate (m ³)		Required Attenuation Volume = 0.0342 m ³	
Maximum Volume of Attenuate: 0.03 m ³		Climate Change = 1.2		Required Attenuation Volume based on a Return Period of: 100 years	
Note: This spreadsheet calculates the Volume of Attenuate based on a Return Period of: 100 years.					

Storm Duration (Hours)	Rainfall (mm)	Total Surface Water (m ³)	Allowable Discharge (m ³)	Attenuate (m ³)
0.03	6.50	0.14	0.108	0.03
0.08	11.50	0.24	0.288	0
0.166	18.50	0.39	0.5976	0
0.25	22.00	0.46	0.9	0
0.50	28.50	0.60	1.8	0
1.00	34.50	0.72	3.6	0
2.00	42.00	0.88	7.2	0
4.00	50.50	1.06	14.4	0
6.00	59.50	1.25	21.6	0
12.00	72.00	1.51	43.2	0
24.00	87.00	1.83	86.4	0
48.00	101.00	2.12	172.8	0
72.00	111.00	2.33	259.2	0



6.2 Soakaway Calculation Sheet

 LOHAN & DONNELLY Consulting Engineers <small>13 Gardiner Place, Mountjoy Square, Dublin 1 T: 01 8787770 W: www.lohan-donnelly.com E: info@lohan-donnelly.com</small>	Project No.	21282		
	Calculation	Soakaway		
	Location	Muckross Ave		
	Date	19/01/2022		
	Revision	P1		
Soakaway Type	Stone Fill			
Void ratio	30%	Using Stone Fill with 30% Voids		
Critical Storm Return Period		100	Year	
Area Drained		44	m ²	
Climate Change Factor		1.2		
Soakaway Dimension	length	4.4	m	
	Width	1	m	
	height	0.80	m	
	Permeability	1.55E-05	m/s	
Safety Factor		1		
permeability with SF		1.55E-05	m/s	
Infiltration Area - 50% effective height		4	m ²	
Infiltration Area - Base		4	m ²	
Total Infiltration Area (as ⁵⁰);		8.7	m ²	
Outflow(m ³ /hr)		0.49		
Time	Rain Fall Depth (mm)			
60 min		34.5		
120 min		42.0		
240 min		50.5		
360 min		59.5		
720 min		72.0		
1440 min		87.0		
2880 min		101.0		
4320 min		111.0		
Storm (mins)	Inflow(m ³)	Outflow (m ³)	Volume (m ³)	
60	1.52	0.49	1.03	
120	1.85	0.97	0.87	
240	2.22	1.95	0.28	
360	2.62	2.92	0.00	
720	3.17	5.84	0.00	
1440	3.83	11.68	0.00	
2880	4.44	23.36	0.00	
4320	4.88	35.03	0.00	
	Volume Required (m ³)		1.05	
	Volume Provided (m ³)		1.06	
			SOAKAWAY LARGE ENOUGH	