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Drainage Report for Infill Dwelling at 16 Muckcross Green Perrystown, Dublin 12

1.0 INTRODUCTION

Coughlan Consulting Engineering have been instructed to carry out a report which describes how the proposed development at the above address will meet the requirements of South Dublin County Council's drainage criteria. This report will demonstrate how the *Foul* and *Surface* water generated by the property will adequately meet the relevant codes of practice.

1.1 SITE LOCATION

The proposed site is located beside 16 Muckcross Green, Perrystown, Dublin 12, D12 YN50. The map reference for this building is X (Easting): 312443, Y (Northing): 230518. Latitude: 53.313221, Longitude: -6.3134399.



2.0 PROPOSED DEVELOPMENT WORKS

The overall Site Area is 486m².

The existing site is a green field site with no current structures, situated between 16 Muckross Green and 17 Muckross Green.

It is proposed to construct a two- storey, 4-bedroom detached dwelling, bin store and bike store with front parking. The proposed dwelling has a footprint of 202 m².

There is a proposed side garden area to the West approx. 83m² and a rear garden area to the North approx. 74m² which provides the open amenity space. There is permeable paving around perimeter of the dwelling where possible. The 2 car parking spaces and turning areas are permeable gravel construction.

3.0 Existing Site Services

From the public records, (received from the Drainage Division), it shows a 225mm Foul Gravity Sewer along the green flowing in a South East direction. There is a manhole at the head of this sewer just outside No. 16 Muckross Green with a Cover Level of 49.10m and Invert Level 48.10m. It is proposed to connect the foul sewer system from the proposed dwelling into this existing foul manhole.

There is a public storm water gravity sewer running parallel to the foul sewer flowing in a South East direction. This also has a manhole at the head of this sewer just outside No. 16 Muckross Green with a Cover Level of 49.12m and Invert Level 48.10m. It is proposed to connect the on-site attenuation system into this existing manhole.

The Existing Watermain is a 101.6 Cast-Iron main from 1954 within the footpath around Muckross Green, it is proposed to connect to this.



4.0 PROPOSED SERVICES

4.1 FOUL DRAINAGE

The proposed foul wastewater system is to be designed and constructed in accordance with Irish Water Code of Practice for Wastewater Infrastructure Connections Document—CDS—5030—03, July 2020 (Revision 2) and Technical Guidance Document Part H (2016)

It is proposed to connect the foul sewerage from the proposed dwelling to a foul sewer system comprising of 110mm 6 uPVC pipes at 1:60 Gradient. Sewer pipes are to be connected with 'WAVIN' 4D.960 Shallow Inspection Chamber provided at: on or near the head of each drain run, at bends or change of gradient and at junctions. The system is to be ventilated through 2 no. vent stacks.

In accordance with Table 6 TGD Part H (20016), for 1 no. dwelling with a minimum of 1 W.C. with a peak flow < 2.5 L/sec, pipes are to be laid at a minimum 1:60 gradient. uPVC pipes must be manufactured in accordance with BS 4660, I.S. EN 1401-1 or BS ISO 4065.

It is also proposed to construct an access chamber within 1m of the front boundary to Irish Water Standard Details WW-13, and Section 3.11.14 of Irish Water Code of Practice for Wastewater Infrastructure Connections Document—CDS—5030—03. This unit can also be a proprietary approved plastic unit in accordance with EN 13598-2, such as the 'Wavin' Tegra600.

Pipe underbed should consist of bedding material laid to the correct gradient and across the full width of the trench. Small depressions should be made in the underbed to accommodate junctions. The underbed should provide uniform support to the pipework over its entire length. Suitable bedding material includes: Granular aggregate, 10mm nominal size for pipes 100mm - 250mm diameter or Sand or sand/gravel mix, maximum particle size 20mm If a pipe is to be surround with concrete it is recommended that the pipe be surrounded by a membrane (plastic sheeting). Adjacent pipes should be connected with proprietary joints.

Refer to CCE Drawing - 102

4.0 STORM WATER

A new surface water system will be installed to collect rain water from all impervious areas of the new proposed development, it will comprise of 160mm g uPVC pipes at 1:50 Gradient. These will discharge all stormwater to a StormTech SC310 attenuation system to be designed by 'Resolute Group'—this is an attenuation system that connects to the existing surface water manhole and releases water at a slow rate in accordance with County Council guidelines through a Hydro brake System. The paving around the dwelling is to be permeable and constructed in accordance with Roadstone specifications.

The StormTech SC310 attenuation system consists of interlocking tunnels and end caps made from injection moulded yellow polypropylene. The chambers are assembled to form an underground

structure. The chambers are infilled with stone material - washed (clean), crushed stone to BS EN 13242: 2013, sizes 20/40 or 20/32.

The chambers and the crushed stone edge are wrapped in a non-woven geotextile to prevent migration of fines from surrounding soils. A geomembrane is used to surround the crushed stone for attenuation applications where infiltration is not permitted.

An isolator row is installed to prevent silting of the chambers and to allow for periodic maintenance cleaning. The isolator row traps silt, preventing it spreading to other rows, and allows access for periodic maintenance cleaning.

Refer to CCE Drawing - 102

INSTALLATION

A trench is excavated to the required depth, dimensions and levels. It must be ensured that the plan area is sufficient to allow compaction plant access around sides to compact backfill material (300 mm minimum).

The subgrade must be smooth and level without sharp drops or humps. Slopes must be cut to a safe angle or adequately supported and safe access must be provided to allow personnel to enter the excavation. Excavation should be carried out in accordance with BS 6031: 2009, with particular attention paid to safety procedures.

The subgrade must be inspected for soft spots in the formation and if any are present, they must be excavated and replaced with compacted granular fill material to achieve the design.

The geotextile and/or geomembrane should be placed over the prepared subgrade soils and up the side walls of the excavation. Where a membrane is used, the manufacturers' recommendations for making joints should be followed and care must be taken to prevent damage to the membrane during construction.

A layer of clean, crushed, angular, structural aggregate is placed over the entire base of the excavation and mechanically compacted to achieve a flat surface. The minimum thickness of this layer must be 150 mm.

The correct position of the inlet pipe should be established and chambers laid from this point. The first chamber should be oriented with the end labelled 'Build rows in this direction' closest to the edge of the bed and the arrows pointing in the direction of build; the edge of the chambers should be a minimum of 300 mm from the perimeter of the excavation.

The row of chambers is laid with successive chambers overlapping its predecessor by the end corrugation. End caps are placed into the end corrugation of the last chamber. Adjacent rows must be spaced at least 150 mm apart, measured at the toe of the chambers.

When installing an isolator row, a woven geotextile is placed on the foundation layer immediately below the row of chambers and a non-woven geotextile is placed over the top of the isolator row. Inlet and outlet connections are made by cutting holes in the end caps using a reciprocating saw. When

installing a sealed system, particular care must be taken to ensure correct sealing of inlet and outlet pipes to the membrane.

Clean, crushed structural aggregate is placed between the adjacent rows and around the perimeter of the chambers. Care must be taken to ensure that the chambers are not displaced and the minimum 150 mm spacing is maintained. The aggregate must cover the crown of the chambers by at least 150

The geotextile and/or geomembrane is laid over the top of the aggregate. The backfill above the geotextile should be Type 1 or Type 2 sub—base selected granular material in accordance with The Manual of Contract Documents for Highway Works, Volumes 1 and 2. It should be compacted in 150 mm thick layers and carried out to a minimum 95% of the standard proctor density. Compaction plant should not exceed a maximum gross vehicle weight of 5 tonnes.

The overall thickness of the backfill above the crown of the chambers must be a minimum of 460 mm to the bottom of the pavement and a maximum of 2440 mm to the top of the pavement. Where it is unpaved, rutting from vehicles may occur, the minimum cover must be increased to 600 mm. The pavement construction or landscaping is completed over the system.

Proposed Flat Roof Area = 30 m²

Proposed Pitched Roof Area (Plan) = 106 m²

Effective Design Area = plan area x 1.0 = 106 x 1.15 = 121m² [Table 16 T.G.D. Part H (2016)]

Proposed Paving = 89 m² / Proposed Gravel / Hardstand = 41 m²

Roof	= 151 x 1.0	= 151m ²
Paving/ Hardstanding	= 130 x 0.9	= 117 m ²
Total	= 151 + 117	= 225 m ²

Q= Ap x i x Cv x 2.78

Ap Impermeable Area (Ha)

i = Intensity of Rainfall (75mm/hr - Roofs)

i=Intensity of Rainfall (50mm/hr - Paved Surfaces) Cr = Routing coefficient 1.3

Cv = Volumetric run-off coefficient: 0.9 (Conservative)

Ap (Roofs) 151m² = 0.0151ha

Ap Impermeable Area) 117 m² = 0.0117ha

Q (Roofs) = 0.0151 x 75 x 1.3 x 0.9 x 2.78 = 3.68L/sec

Q (Impermeable Area) = $0.0170 \times 50 \times 1.3 \times 0.9 \times 2.78 = 2.76$ L/sec

$Q_{\ll} = 2.63 + 2.11 = 6.5$ L/sec (0.0065 m³/sec)

4.0 WATER SUPPLY

The proposed Water Supply system is to be designed and constructed in accordance with Irish Water Code of Practice for Water Infrastructure Connections Document—CDS-5020-03, July 2020 (Revision 2).

It is proposed to connect to the existing looped 101.6 Cast-Iron Watermain (1954) in Muckcross Green with a water service connection 25mm (o.d.) PE pipe (15m max. length). The Customer Water Service connection is to be made through an Irish Water Boundary Box in accordance with Irish Water Standard Detail W-01 & W-03.

Boundary Box is to be located at the public side of the property Curtilage, as close as possible to the property boundary, but separated by at least 225mm from the face of the boundary. Irish Water supply the meter and install it within this Boundary Box. The optimum depth of cover at the Boundary Box should be 600mm +\ - 25mm, with a maximum depth of 750mm.

Refer to CCE Drawing - 102

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