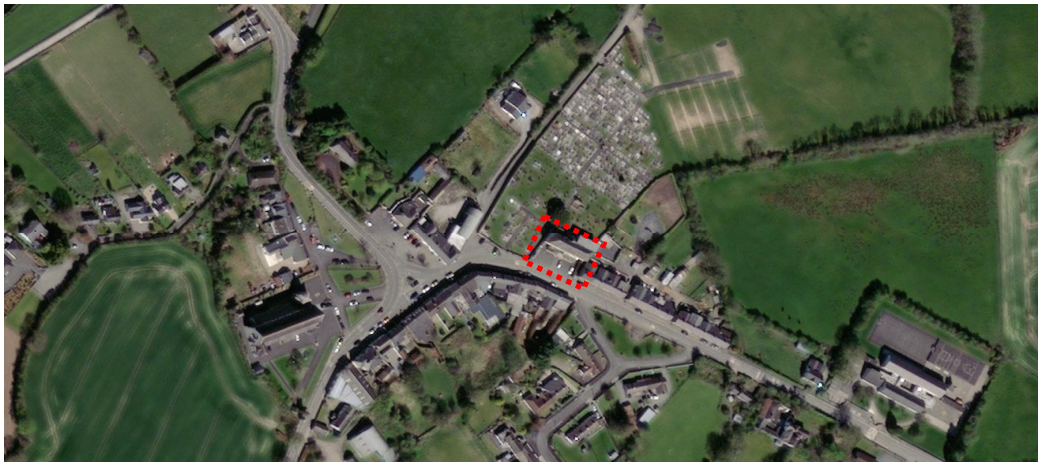
BOWE CONSULTING ENGINEERS
CIVIL & STRUCTURAL

Civil Engineering Site Services Report

Proposed School House Community and Enterprise Centre, Rathvilly, Co. Carlow.



This report takes into account the particular instructions and requirements of our Client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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APPENDIX

1. INTRODUCTION

The purpose of this report is to outline the design recommendations and construction methodology used by Bowe Consulting Engineers in completing the site services drainage design for this proposed development on Phelan Street, Rathvilly, Co. Carlow.

Bowe Consulting Engineers were engaged by Carlow County Council to work in association with O'Driscoll Lynn Architects and Brennan Associated Project Managers in the preparation of a drainage design solution for the School House Community and Enterprise Centre.

2. PROPOSED DRAINAGE DESIGN

2.1 Stormwater Design: Introduction

The pipe network for the catchment has been modelled using the Rational Method. The pipe sizes and gradients have been designed to ensure a minimum partial velocity of 0.75lt/sec. The surface water network has been designed in accordance with Surface Water Sewer Network Design in accordance with B.S. EN 752:2008 Drain & Sewer Systems outside Buildings, BS8301: 1985 code of practice for building drainage and Recommendations for site Development works. Please see appendix A for storm water calculation sheets.

In order to comply with the requirements of Carlow County Council it is necessary to comply with Carlow County Council policies regarding surface water drainage and SuDS objectives, which are outlined in the Carlow Development Plan, see section 2.2 for a description of the proposed SuDS design for the site. We also ensure our design is carried out in accordance with leading industry standard guidance such as CIRA C753 The SuDs Manual and recommendations contained in the Greater Dublin Strategic Drainage Study (GDSDS).

Our proposed storm water management system utilises the benefits of on-site infiltration to subsoil via an attenuation tank constructed using a permeable membrane liner. An attenuation storage volume for a 100-year storm event, with an additional 10% event to cater for climate change.

A preliminary review of the stormwater design requirements for this development was held with the local area engineer Mr. Pat Harrington Carlow County Council. It was agreed in principle with Mr. Harrington that a separate surface water system would be preferable to the continued discharge of storm drainage into the Rathvilly foul sewer network. Stormwater outflow from the site would be resisted to the green field run off rate of 1 lt/sec.

Please refer to Bowe Consulting Engineers drawing ref. 22P1544-P01 to 04 for the proposed storm water layout and associated construction details. See appendix A of this report for attenuation tank and storm drainage calculations.

2.2 Stormwater Design: SuDS Design

The proposed SuDS Design for this development was included to that there would be no increase in flood risk to any development within the site or elsewhere.

The existing storm water collected on site discharges to the public foul sewer located on Phelan Street. As noted above the proposed SuDS technique for this development consists of a permeable membrane lined attenuation tank.

Geotechnical records and local knowledge indicate a low soil infiltration rate in the Rathvilly area and thus we have recommended the use of an attenuation tank with a stormwater discharge restricted to the greenfield run off rate.

In summary we note that by allowing infiltration from the attenuation tank we have provided both Source Control and Site Control measures that will reduce the rate and volume of run-off from the site, while also ensuring the environment is protected from any pollution from roads and buildings.

2.3 Stormwater Design: Attenuation Design

It is proposed that storm water from the proposed paved area and roofs shall attenuated prior to discharge to the existing public storm drainage network.

The Carlow County Council storm drainage policy mandates that the outfall flow rate be restricted to either the greenfield QBAR rate, which is 1 lt/sec for this site. Please see appendix A for Qbar calculation.

The storage volume required for the development was calculated using rainfall intensities for the Rathvilly area, for return periods of 1 in 30 and 1 in 100, with a 10% increase to cater for climate change in accordance with Carlow County Council Storm Drainage policy and guidance given in the Greater Dublin Strategic Drainage Study (GDSDS).

We have proposed the use of a Hydro-Brake Optimum flow control unit to control outflow into the existing public storm drain. This is a vortex flow control device for controlling fluid flow by hydraulic effect without requiring moving parts, the unit is independently tested and certified by the WRc (British Water Research Council) and the BBA (British Board of Agrément: Construction Product Certification).

See Appendix B for the technical details and a typical installation drawing for the Hydro-Brake flow control device and the proposed attenuation tank suppliers GRAF Ltd.

3. FOUL DRAINAGE DESIGN METHODOLOGY

The proposed foul drainage system consists of a gravity system on the site which conveys the effluent to proposed manhole that will be built over the existing 150mm diameter uPVC site outfall pipe, which connects to the public sewer via the 150mm diameter pipe located in the neighbouring access driveway.

A CCTV survey of the existing sewer network was carried out by A&T Drain Services Ltd and the 150mm diameter outfall pipe located within the School House Community and Enterprise Centre site was described in CCTV report as follows,

- *'Line has small dip but in good condition'.*

Permission was granted by the neighbour to carry out a CCTV survey of the foul line located on their access road and this pipe was described in the CCTV report as follows,

- *'The overall condition of the pipe is good. You can see the pipe coming from the Phoenix building. When we reach the mainline you can see what appears to be a manhole which is covered over'.*

Please refer to Bowe Consulting Engineers drawing ref. 22P1544-P01 to 04 for the proposed foul sewer layout and associated construction details. See appendix A of this report for foul sewer pipe design calculations.

The foul sewer has been designed in accordance with the Colebrook-White formulas, B.S.752:2008, Drain & Sewer Systems and the current Building Regulations. Calculation of the design flows were carried out using the Discharge Unit Method in accordance with BS EN 12056-2:2000 where the maximum velocity (and partial full velocity) for the sewerage in the network has been designed to be between 0.75lt/sec and 3lt/sec.

The foul pipe design calculations are contained in appendix A, which show that all pipe have been designed with adequate capacity and partial velocities, thereby ensuring adequate self-cleansing velocities for the entire system.

4. WATERMAIN DESIGN

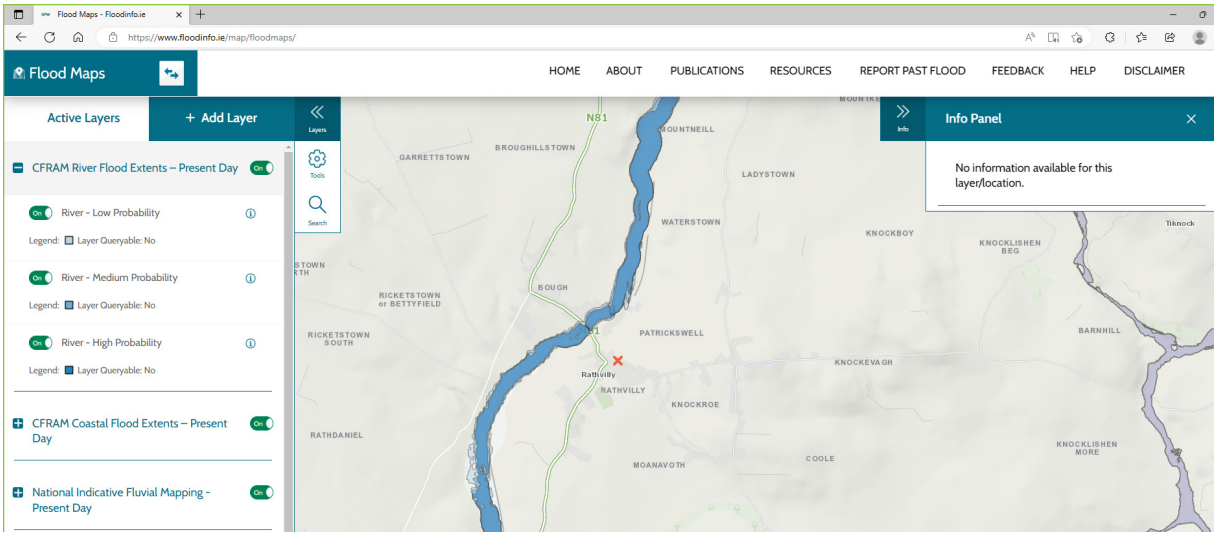
It is proposed that an application to Irish Water will made a new connection watermain to the existing 100mm diameter public watermain which is located in Phelan Street and directly adjoining the site.

The proposed water supply will be metered in accordance with the requirements of the Local Authority / Irish Water. Please refer to Bowe Consulting Engineers drawing ref. 22P1544-P01 to 02 for the existing and proposed water supply service to site.

5. FLOOD RISK ASSESSMENT

A review of the Floodmap.ie and Floodinfo.ie website-based flood history records confirms that there is no history of flooding on the proposed development site.

In summary the proposed development is not located within a flood zone.



Screenshot showing relevant River Slaney floodmap extract taken Floodmaps.ie

6. CONCLUSIONS

- ✓ The storm management system on the site has sufficient capacity and a connection to an appropriate outfall can be established without difficulty, thus ensuring adequate drainage for the proposed development.

- ✓ The foul drainage proposed for the site has adequate capacity and partial velocities. The site benefits from an existing connection to the public foul sewer and this connection will, thus ensuring adequate foul drainage for the proposed development.

- ✓ A new potable water connection is proposed to the existing public watermain located on Phelan Street which fronts the site.

- ✓ There is no history of flooding to the site and the site is currently not located within a flood zone.

Should you have any queries regarding the above, please contact the office of Bowe Consulting Engineers.

Signed: _____ Date: 23rd of September 2023

IVOR BOWE
Chartered Engineer on behave of
Bowe Consulting Engineers

APPENDIX A - Drainage Design Calculations

Qbar Design Calculation
Attenuation Volume Calculation
Foul and Storm Drainage Design

APPENDIX B - Typical Product Specifications

Flow Control Details

Attenuation Tank Details

ISSUE REGISTRATION:

Project: Proposed School House Community and Enterprise Centre, Rathvilly, Co. Carlow

Project No: 22P1544-C.06

Rev.	Date	Purpose of Issue/Nature of Revision	Prepared by.	Issue Authorised by.
R1	24th of Jan '23	Issued to Client and the Design Team	Ivor Bowe	

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