HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS • PROJECT MANAGERS

Civil Engineering Services Report

For

Residential development at Craddockstown,

Naas, Co. Kildare

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Revision	Status	Author	Reviewed By	Approved By	Issue Dates
P	Planning	PN	LM	DH	March 2024

1. Introduction

Hayes Higgins Partnership has been commissioned to prepare a Civil Engineering Services Report for the proposed residential housing development at Craddockstown, Nass, Co. Kildare.

This report was compiled after reviewing the available information on drainage and water supply, reviewing the OPW flood maps and other available information from public bodies. It contains information on the design of the surface water and foul drainage systems to be constructed for the proposed development.

The design of both the surface water and foul drainage systems has been carried out in accordance with the following:

- The Greater Dublin Regional Code of Practice for Drainage Works
- Technical Guidance Document H of the Building Regulations
- The Greater Dublin Strategic Drainage Study (GDSDS)
- DOE Recommendations for Site Development Works for Housing Areas
- BS 8301:1985, Code of practice for Building Drainage
- BS EN 752 External building drainage
- OPW The Planning System and Flood Risk Management
- Uisce Éireann Code of Practice and Standard Details (Water & Wastewater)
- Kildare County Council Sustainable Drainage Systems Guidance
- Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas
- The SuDS Manual (C753)
- Kildare County Development Plan 2023-2029
- DMURS – Design Manual for Urban Roads and Streets

The proposed surface water drainage system is a combination of SuDs mechanisms including permeable surfaces, tree pits, swales / rain gardens / landscaped areas and gravity feed drainage systems discharging to soakaway system. The permeable parking spaces will be used as a stone storage / infiltration area also. Surface water run-off from the new road and houses will be dealt with on the site and a connected to the soakaway system located in the large green area. Soakaway systems in the rear gardens are provided for the houses. The surface water system is designed to take the runoff generated by a 1 in 100 year storm event (+30%).

The foul drainage system for the proposed development is a gravity feed system within the site connected to an existing foul manhole on Eustace Demesne Drive Road north of the site.

There will be a full separation of the foul and surface systems within the site.

2. Proposed Site

The site in question is located approximately 2.2 km from South Main Street, Naas at Craddockstown Road. The existing site is a greenfield site. The proposed site measures approximately 0.83ha. The site is bounded by residential units to the north, south & east and Craddockstown Road to the west. The topography of the site shows a general rise in level from north to south direction. A copy of the site survey is included in Appendix C. Proposed on the site is 28 housing units (25 houses & 1 communal block with 3 units) with associated facilities and 33 parking spaces. The development will be accessed from a new entrance on Craddockstown Road, this to the west of the proposed site. The site will be also accessible by the footpath and cycle lane through the existing northern boundary, the current boundary wall will be adjusted to suit this new pedestrian / cycle entrance.

3. Surface Water Drainage

Local Authorities require that all developments include a sustainable urban drainage system, SuDS. A combination of SuDS mechanisms will be utilised on this site. Having undertaken a detailed review of the current site (including site investigations), the surrounding areas and the proposed development a detailed surface drainage strategy has been developed in accordance with Kildare County Council Sustainable Drainage Systems Guidance and all current SuDS guidelines. Kildare County Council Sustainable Drainage Systems Guidance, the SuDS justification matrix (contained in Appendix G) and the site investigation was used as a basis for design. While considering all options for SuDS measures on this site input from the client was also sought. All possible SuDS mechanisms that could viably be used on this site have been explored.

SuDS measures to be utilised on this site include;

- Permeable surfacing – will be used within the parking areas. This will allow natural infiltration. These areas have been suitably sized to stone surface water from the surrounding areas. 300mm depth of stone within the permeable paving will be provided.
- Tree pits – will allow natural infiltration. The use of the tress pits as natural infiltration / storage of surface run-off has not been considered in the surface water calculations, it will however, contribute positively to the overall surface water strategy for the site.
- Rain gardens / planting – will allow natural infiltration. The use of the tress pits as natural infiltration / storage of surface run-off has not been considered in the surface water calculations, it will however, contribute positively to the overall surface water strategy for the site.
- Soakaway system – the site investigation confirmed the site is suitable for infiltration and as such permeable surfacing and soakaway systems will be used on site. The surface water generated from the new road and houses on site will be connected to a soakaway located in the large green area on the proposed site. The soakaway located in the large green area is 10m (wide) x 1.5m (deep) x 10m (long). Surface water from the house hardstanding is dealt with via a soakaway in the rear gardens. Soakaways in the rear gardens are sized for to take the full roof areas, however some roof drainage may run to the main soakaway and hence this has been sized accordingly..

To alleviate any possible risk of flood the on-site surface water system is designed for a 1 in 100-year storm (+30%). A 30% increase in runoff due to global warming is included. Site specific MET Eireann Rainfall data has been used in the surface water drainage and soakaway design. There will be a complete separation of the foul and surface water drainage systems within the site, both in respect of installation and use. The surface water drains are designed in accordance with BS EN 752, Code of Practice for Drainage Outside Buildings.

Refer to Appendix A for the Storm Water Layout and Appendix C for the surface water calculations.

4. Foul Water Drainage

The foul drainage system has been designed in accordance with Uisce Éireann Code of Practice and Standard Details for Wastewater, BS 8301:1985, Code of Practice for Building Drainage and the current Building Regulations and Irish Water Code of Practice.

The foul drainage system for the development is a gravity feed system falling to an existing foul manhole on Eustace Demesne Drive Road north of the site. The main foul sewers in the proposed development are to consist of 150mm diameter uPVC pipe and 225mm diameter uPVC pipes with required fall designed throughout to minimise the risk of blockages and to aid maintenance. The development will not result in a significant increase in foul discharge from the site on the public system. A roughness coefficient (ks) of 0.6mm is applied to the design of all pipes. The existing 150mm diameter uPVC pipe in in Eustace Demesne Drive Road to be upgraded to 225mm diameter uPVC pipe.

A Pre-Connection Enquiry form was submitted to Uisce Éireann and a Confirmation of Feasibility letter was received confirming the development is feasible without upgrade to infrastructure. Details of the proposed foul sewer system for this site are shown in Hayes Higgins Partnership drawing within Appendix A. Calculations are provided within Appendix D.

5. Water Supply System

There is an existing 100mm diameter water main on on Eustace Demesne Drive Road north of the site. The proposed 100mm HDPE looped watermain on site will connect into this main line.

In accordance with requirements air valves and scour valves will be provided around the site as necessary. Hydrants will be provided as directed by the Fire Safety Certificate and Technical Guidance Document B of the Building Regulations 2006. Water saving devices including aerated taps and low water usage appliances will be used in the proposed development in accordance with best practice. The water supply system has been designed and will be installed in accordance with Uisce Éireann Code of Practice and Standard Details for Water.

The proposed watermain layout and details are shown on Hayes Higgins Partnership drawing within Appendix A.

A Pre-Connection Enquiry form was submitted to Uisce Éireann and a Confirmation of Feasibility letter was received confirming the development is feasible without upgrade to infrastructure.

6. Flood Risk Assessment

A stage 1 desktop flood risk assessment was undertaken to identify possible sources of flooding, and the risk posed to the development, and separately the risk posed to surrounding areas because of the development. The site is situated far enough away from the sea not to be subjected to coastal or fluvial flooding. The topography of the site shows that the site slopes off in a north direction.

External Sources

The OPW flood mapping website, www.floodmaps.ie has been reviewed.

From the information contained in this report it is evident that the site has not been subjected to flooding during previously reported flooding events. As such it is reasonable to assume there is no risk to the proposed development resulting from flooding off-site.

Internal sources

It is intended that all surface water run off generated by the 1in100 year storm will be dealt with via the onsite drainage systems. An allowance has been made for a 30% increase in runoff due to global warming, as per the "Greater Dublin Strategic Drainage Study" recommendations.

Due to all these factors the risk of flooding is minimal.

7. Site Layout

This development has been designed in accordance with Design Manual for Urban Roads and Streets (DMURS), refer to site levels layout drawing 24D024-01 and 24D024-02, minimum footpath widths and junction radii have been provided to comply with DMURS. A swept path analysis has been carried out for a fire truck as shown on drawings 24D024-07, refer to Appendix F. A Road Safety Audit has been completed and all comments incorporated into the design of the development. Refer to Appendix J.