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CIVIL & STRUCTURAL ENGINEER REPORT

FOR

Housing Scheme

At

Ballymoe, Co. Galway

March 2022

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Title

Document Title	Civil & Structural Engineer Report for Housing Development at Ballymoe, Co. Galway
Document Ref	2636

Date	Edition/Rev	Status	Originator	Checked	Approved
16.03.2022	First	Planning	R O'C	MK	MK
01.04.2022	Second	Planning	R O'C	MK	MK
13.04.2022	Third	Planning	R O'C	MK	MK

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For: Galway County Council

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INTRODUCTION

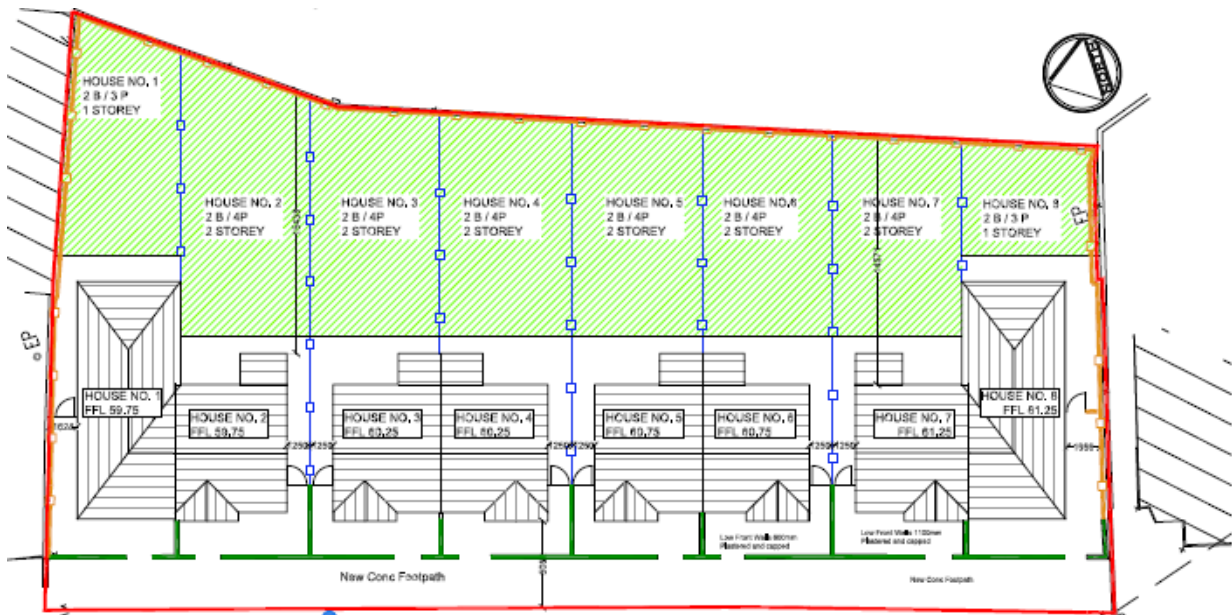
This Civil & Structural Engineer's report has been prepared in support of a full planning application under Part 8 by Galway County Council for a residential development on lands at Durrow, Ballymoe, Co. Galway.

The application is for a development consisting of 8 no. housing units and associated site works and services. The scheme consists of 2 no. two bedroom bungalows and 6 no. two bedroom units all of which are semi-detached.

The site is located on the approach road to Ballymoe from Tuam on the R360 and is located at the edge of the village on the eastern side of the road across from the community centre.

The overall site measures approximately 0.175 hectares and is of rectangular shape fronting the main street footpath (R360). On average the site is 27m deep and approximately 60m wide.

The site appears to be gently sloping towards the village. The site is vacant and is fronted to the street with a fence and has clearly defined boundaries to the three other sites.



SITE LAYOUT

THE DESIGN TEAM

Client	Galway County Council
Architect	Hassett Leyden & Associates
Civil & Structural Engineering	Hassett Leyden & Associates
M&E Engineer	Moloney Fox, Consulting Engineers
Quantity Surveyors	Lawlor Burns
Topographical Surveyor	Control Survey, Limerick
Archaeologist	TVAS Ireland Ltd
Environmental Consultant	Moore Group
Flood Risk Assessment	Tobin Consulting
Road Design Audit	Malachy Walsh & Partners

AIMS

The aim of the proposal is to create an inclusive residential community that respects the existing character of the village of Ballymoe but acknowledges the sustainable growth of the village with an appropriate development for a fully serviced residentially zoned site.

The proposal seeks to respect the existing residential development pattern of the area by aligning the new development slightly set back to the public footpath for privacy and respecting the existing buildings on the adjacent sites. The proposal will be connected to the locality by the use of materials sympathetic with the locality and adapting to the location of the existing streetscape.

Through this architectural design statement, it is aimed to: describe the proposal; outline the conceptual and design process; how the existing site context and landscape is respected; show how ministerial, local authority and development standards are met and how the proposal will be ecologically, economically and socially sustainable.

METHODOLOGY

The purpose of this report is to describe the development with civil and structural details.

The report has been divided into the following sections:

- Section 01 – Surveys
- Section 02 – Civil Engineering
- Section 03 – Road Design
- Section 04 – Structural Elements
- Section 05 – Conclusion

SECTION 02 – CIVIL ENGINEERING SERVICES

2.1 Overview

Existing public services in the vicinity of the proposed development will be utilised to provide foul and potable water facilities to the development. The proposed servicing strategy has taken account of site constraints, current design standards and discussions with the Local Authority, Irish Water & other stakeholders.

2.2 Storm Water

A sustainable urban drainage system (SuDS) in accordance with section 4.2 of Flood Risk Assessment carried out by Tobin Consulting engineers.

Storm drainage proposed will be by means of individual soakaways to each housing unit. The filtration value of existing soil will be calculated in accordance with BRE 365 to evaluate the suitability of same prior to construction. The calculated filtration value and existing water table level will determine the design of the individual soakaway units.

2.3 Foul Sewage

A new 225mm foul sewer is proposed to serve the estate as shown on **Services Drawing 2632-21 Services Layout &** will discharge to the main 225mm within the adjacent R360 road.

A 225mm diameter foul sewer has as per drawing **Services Drawing 2632-21**

All foul services will be designed to meet min requirements as set out by Irish Water Code of practice for Wastewater services & associate details to include.

- Minimum separation distance & capacity of pumping station
- Minimum cover to pipes in non-trafficked areas = 750mm
- Minimum cover to pipes in lightly-trafficked areas = 900mm
- Minimum cover to pipes in trafficked areas = 1,200mm
- Pipes with less cover than stated above shall be bed-and-surrounded in concrete
- Gradients set to meet Minimum self-cleansing velocity of 0.75m/s

2.4 Water Supply

Water supply will be provided to the proposed development via a new 110mm Ø welded HDPE watermain as per drawing **Services Drawing 2632-21**. The locations of valves & hydrants are outlined on the layout drawing. Individual water connection will be 25mm HDPE with metered connection to each unit as per Irish Waters details. The proposed system is designed in accordance with Irish Water Code of practice for Wastewater services & associate details to include:

- Minimum pressure of system
- Minimum cover to pipes
- Minimum hydrants & valves.

A pre-connection enquiry in relation to water and wastewater connection has been lodged with Irish Water for this development on the 26th November 2021, Ref No: **CDS21008381** and it's not envisaged that there should be any issues in relation to capacity of existing sewer or supply from watermain

Confirmation Email below

From: newconnections <newconnections@water.ie>

Sent: Friday 26 November 2021 15:41

To: HLA Mail <HLAMail@hassettleyden.ie>

Subject: CDS21008381 Irish Water Pre-Connection Enquiry EMAIL:0624304

Irish Water Pre Connection Enquiry Ref Number: CDS21008381

Dear Customer,

Thank you for submitting your Pre-connection Enquiry Form for Ballymoe, Ballinasloe, Co. Galway. Your Irish Water reference number for your application is CDS21008381, which you can keep for your records.

Next steps in your enquiry:

Assessment of Enquiry: Your enquiry is currently being assessed to confirm it is technically feasible; we will be in touch once this assessment has been completed. A significant level of analysis is required before we can provide a response. Two of a number of considerations are:

- ❑ A review of the available capacity in Irish Water infrastructure versus your requirements.
- ❑ The location for connection versus the distance to/from our network.

Where your requirements are of a significant nature for example, multiple properties or commercial/industrial developments, this work may take a period of time to complete.

Getting a Confirmation of Feasibility: If your application is technically feasible, we will issue you with a letter of "Confirmation of Feasibility". This will outline what capital works if any, may be required to upgrade the public infrastructure to cater for your development.

From receipt of your Pre-connection Enquiry, it takes on average 16 weeks to issue a Confirmation of Feasibility.

Design Layout Approval: Where you are proposing to apply for a housing development (two or more properties), a **Statement of Design Acceptance** to your proposal will be required from Irish Water before applying for Planning Permission. Please therefore submit your designs for assessment to Irish Water to ensure they comply with our requirements, in advance of applying for Planning Permission.

Connection Application: Your Confirmation of Feasibility; which is a specific requirement to apply for Planning Permission through the Strategic Housing Development process, will assist you in obtaining your Planning Permission following which you may apply for your connection immediately.

If you have any further queries please contact us on **1800 278 278** or **+353 1 707**

2828; alternatively, you can visit www.water.ie/connections for more information. **Please note that the rates charged for 1850 numbers may vary across different service providers. Calls from mobiles may be more expensive.**

Please do not amend this subject line as it will help us deal with your response.

Yours sincerely,

Customer Service Advisor

2.5 Flood Risk

A separate Flood Risk Assessment was carried out by Tobins Consulting Engineers which is included in the planning application.

The report concludes that there is no risk of flooding to this site

In any event the design will be compliant with the following statement:

Surface water arising at the site will be managed by a dedicated stormwater drainage system and on-site infiltration in accordance with Sustainable Drainage Systems (SuDS) principles, limiting discharge from the site to greenfield runoff rates. On this basis, it is predicted that the proposed development will not contribute to flood risk elsewhere in the area, and will mitigate pluvial flooding within the proposed development.

SECTION 03- - ROAD DESIGN

The speed limit on approach to the development is 50km/hr Evidence from recent traffic counters (Nov 15th – Nov 22nd 2021) has shown that the average road speed was recorded in the range of 53km/hr - 63km/hr, with 85% of road users travelling below the recorded speed of 63km/hr.

Road design is to be accordance with the following minimum standards:

It is proposed that the existing road will be modified on approach to Ballymoe village by way of a well-defined Transition zone between rural fringe to urban setting. The transition zone will reduce the existing road width from 8.9m to 6m on approach to the proposed development. The reduced width will be achieved by the introduction of new kerbs and widening of existing footpath in accordance with drawing **2632-20-Road Treatment drawing** and recommendation from Stage 1 Road Safety Audit carried out by MWP, Engineering and Environmental Consultants.

This project does not require a TTA assessment in accordance with table 2.1 of the Traffic Management Guidelines Thresholds for Transport assessments. Only 8 houses are proposed which is clearly below the 200 dwelling threshold.

Table 2.1 Traffic Management Guidelines Thresholds For Transport Assessments

Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.
Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists or the location is sensitive.*
Residential development in excess of 200 dwellings.
Retail and leisure development in excess of 1,000m ² .
Office, education and hospital development in excess of 2,500m ² .
Industrial development in excess of 5,000m ² .
Distribution and warehousing in excess of 10,000m ² .

3.1 Road Layout and Parking Specification

The design complies with the following standards:

Relevant sections of the DMURS manual

Recommendations for Site Development Works for Housing Areas

TII specifications in relation to roads build up and finishes.

3.1 Drainage

Spacing of road gullies will be carried in accordance with TII publication DN-DNG-03067.

No surface water from the development will flow onto the public road.

3.2 Footways

Footways will be compliant with the following:

Tactile paving is constructed as per the current TII detail, CC-SCD-05030. Tactile paving will be located at each pedestrian crossing point, ref DMURS.

All footways will be built in accordance with the following TII documents

- DN-PAV-03026, Footway design
- The latest revision of Series 1100 SCD specifications

3.2 Lighting

The Public Lighting has been designed in accordance with section 4.2.5 of DMURS and the design was reviewed with the relevant section in Galway County Council.

Moloney Fox Consulting Engineers appointed to design the public lighting for the entire scheme.

Drawing PI-001 refers to the public lighting.

3.3 Sight Lines

Minimum sight lines in accordance with table 4.2 of DMURS with no planting of trees or shrubs to be carried out within the triangle of sight visibility.

3.4 Miscellaneous: Waste

All waste generated and transported off site during the construction phase will be managed in accordance with the relevant provisions of the Waste Management Act 1996 and associated amendments and regulations thereof. A construction waste management plan will be requested from the main contractor.

SECTION 04 – STRUCTURAL ELEMENTS

4.1 Overview

The proposed structural design has been completed in compliance with the Current Irish Building Regulations and Eurocodes. The proposed structural scheme is the same for all of the dwellings, and is as outlined below.

4.2 Ground Conditions

The soil investigation company has been appointed. Trial holes have been carried out on site and the presence of sandy clay from depth to 0.8 to 1.1m strata changing to gravelly clay to depth of 1.8 to 2.2m. Water table levels are recorded at an average depth of 1.5m. This type of ground is generally suitable for strip foundations pending confirmation and final design by the structural engineer.

4.3 Foundations

The bearing capacity of the ground would be considered good with gravelly clay with an estimated bearing capacity ranging from 200 – 600 kPa.

The foundations for the buildings shall likely comprise of a raft foundation throughout to ensure a uniform spread of loading to the underlying gravelly Clay above recoded water table level depth of 1.5m

4.4 Ground Floor

The ground floor construction is to comprise of a reinforced 75mm concrete screed on 150mm insulation (to architects' spec) on 150mm RC raft , with edge beam support for external walls on min 225 T2 permeable hardcore layer.

4.5 Walls

The external walls are to comprise a 100mm inner leaf and a 100mm external leaf. The width of the cavity and the insulation is to be as per the Architects specification.

The party walls are to be of cavity construction, comprising a 100mm load bearing masonry wall, a cavity to the Architect specification, and a 100mm load bearing wall to

the adjoining property. The use of a cavity construction party wall is to comply with Part B and Part E of the Current Building Regulations.

All load bearing masonry is to have a minimum mean compressive strength of 7.5N/mm².

The internal non-load bearing walls shall be 100mm thick masonry construction.

Heavy duty lintels are required over the internal leaf of the external window and door openings when located below masonry supporting the precast concrete first floor or where the proposed span is 1.5m or greater internal & external leaf. Any openings exceeding 2m or corner windows etc will require specifically designed steel lintel. All remaining external openings will require an inner and outer precast concrete lintel to support the blockwork over. All precast lintels to be CE marked and certified for approval.

4.6 First Floor

First floor to consist of 44 x 225mm C18 grade timber with bridging at 300mm centres with max span of 5m. Floor joists to be fixed to external walls with galvanised joist hangers

Floor build up to Architect's specification with recommended min 18mm T&G flooring and 15mm Gyproc Fireline ceiling slab to achieve 30mins fire resistance in accordance with manufactures test data.

Hollowcore slab to be designed by supplier for floors to all apartment or dwellings with more than 1 floor above ground floor level.

4.7 Roofs

The roof is to comprise slates and insulation to the Architects specification, on prefabricated timber structure, the design of which is to be undertaken by a prefabricated timber truss supplier. All calculations and drawings are to be approved by engineer prior to fabrication.

4.8 External Walls

All walls to be in accordance with Architect specification to include boundary & dividing walls.

Block boundary walls to have piers every 3.5m centres with control joint every 7m.

Review of current levels would indicate that there will be no retention requirements on the site

SECTION 05 – CONCLUSION

At this stage of the project, we do not envisage any major issues that would impact on the viability of the project.