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Joe & Ann Headon

**Engineering Report in support of
submission to Draft Kildare County
Development Plan 2023-2029**


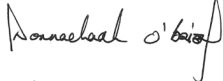
Lands at Ballymore Eustace, Co. Kildare

May 2022

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Document Control

Document:		Engineering Report in support of submission to Draft Kildare Count Development Plan 2023-2029			
Project:		Lands at Ballymore Eustace, Co. Kildare			
Client:		Joe & Ann Headon.			
Job Number:		DOBA 2231			
File Origin:		<u>File:</u> Engineering Constraints & Feasibility Report.doc <u>Location:</u> \\DOBSERVER2019\Projects\Projects\DOB&A Projects\2022 Projects\DOBA 2231 -\8.1 Reports\			
Document Checking:					
Author		Donnachadh O'Brien		Signed: 	
Issue	Date	Status	Issued to	Copies	Checked for Issue
1	2022.05.23	Issue 1	David Mulcahy	1E	

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1 Introduction

Donnachadh O'Brien and Associates Consulting Engineers Ltd. (DOBA) have been appointed by Joe & Ann Headon to prepare a preliminary engineering feasibility report to support a submission by David Mulcahy Planning Consultant to Kildare County Council in relation to the Draft County Development Plan 2023-2029 for lands located at Ballymore Eustace, Co. Kildare. This report has been compiled using desktop information gathered and publicly available resources including Kildare County Council, Irish Water, and other utility providers. No site visit of the lands has been made and no surveys or other investigative works were undertaken.

2 Existing Lands

The lands are approximately 7 hectares in total, located to the south-east of Ballymore Eustace, approximately 420m from the village centre. The site location is shown outlined in red in Figure 1 below and comprises of agricultural lands enclosed by mature hedgerow with an area of woodland located on the western and southern portion of the site. The site has agricultural access off the L2025 and has a site boundary to the L2025 on its north eastern boundary. There is an existing dwelling (in the same ownership) adjacent to the site to the north east and agricultural lands to the south, east and west. The site to the North is bounded the L2025 and some private dwellings.



Figure 1 Site Location

3 Site Development Assessment

3.1 Road Infrastructure

The site frontage to the north is bounded by the L2025 which continue eastward where it intersects the N81. It extends in a general westerly direction from this junction towards Ballymore Eustace village where it intersects the R411 Regional Road. In the vicinity of the subject lands, the L2025 is approximately 6m wide with no hard shoulder or footpaths. It has a centreline road marking and a grassed verge and hedgerow on both sides. It currently has a posted speed limit of 50kph as it approaches Ballymore Eustace.

The land owners have had extensive correspondence and communication with KCC Roads and planning department in relation to facilitating improved footpath and pedestrian facilities in the vicinity of the site. We understand that KCC are looking to implement village improvement works incorporating a safe looped walkway and are very anxious to complete the loop and make safe that portion of road that runs in front of the subject lands, including connectivity improvements from the Irish Water Site to Pudding Lane. The landowners Joe and Ann Headon are willing to co-operate fully with KCC to make the necessary improvements for vulnerable road users for the wider benefit of the community and residents in Ballymore Eustace.

3.2 Sightlines

In order to create safe road junctions and accesses there are minimum distances required in which unobstructed sight is achieved. These distances can vary depending on the design speed of the road. Nearby road signs on the L2025 show a posted speed limit of 50km/h and it is anticipated that any future development of the lands for services sites would be facilitated within the 50kph speed zone. As part of any future potential development, it is our opinion that the L2025 would benefit from a village gateway located east of the existing 50kph speed sign which would reduce traffic speeds on approach to the village.

Visibility from any proposed junction will be required to be assessed in accordance with Section 5.6.3 of TII Publication's document DN-GEO-03060, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions)." For a Design Speed of 50kph unobstructed visibility of 70m is required in each direction from a distance of 2.4m back from the edge of the major road. It is anticipated that subject to detailed design, and some modifications to existing hedges and roadside vegetation that a safe vehicular access can be achieved to the subject lands from the L2025, as demonstrated in Figure 2 below.

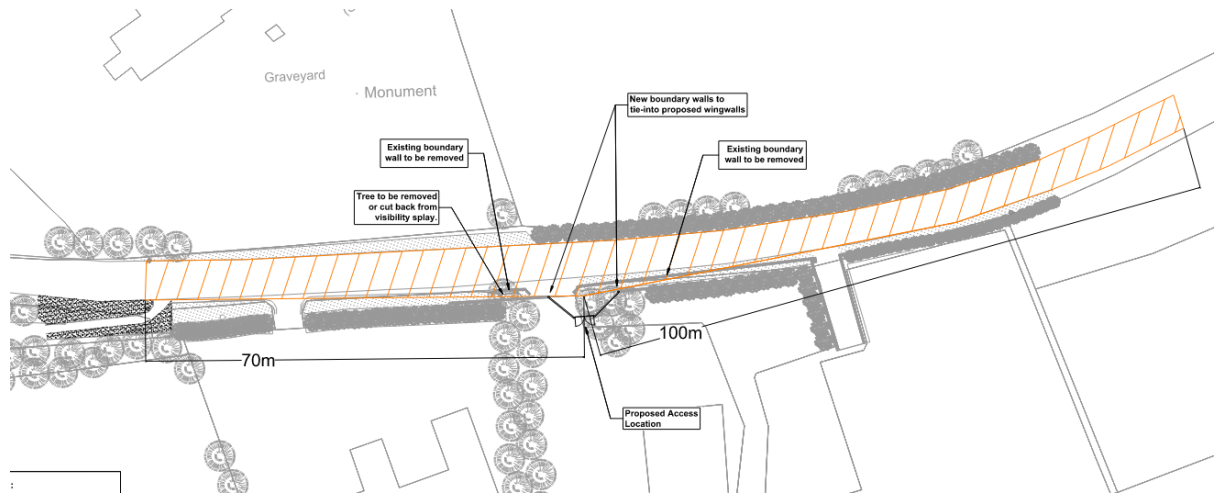


Figure 2: Sight line assessment for Subject Lands along L2025

3.3 Water Supply

3.3.1 Irish Water maps indicate the presence of a 375mm diameter watermain running across the subject lands and generally heading in the direction of the Ballymore Eustace Water Treatment Works located to the south east of the lands. This water main continues in a north east direction across the site in the direction of Ballymore Eustace and was also identified in the recent KCC granted residential planning application on an adjacent site (21-1643) with a 7m wayleave was indicated. Normal procedures apply to existing Irish Water assets and either the pipe will remain in location with its existing wayleave or it can be diverted by agreement with Irish Water.

3.3.2 For a future residential development of serviced sites on these lands, the minimum required watermain size is likely to be 100mm, in accordance with the Irish Water Code of Practice and it is probable that this connection can be provided from the existing 375mm diameter watermain traversing the site. If the proposed site were to proceed to planning, a formal pre-connection enquiry would be made to Irish Water to confirm that a water connection to the site is feasible, but we do not consider that the provision of potable or fire fighting water would be a constraint if the subject lands were to be developed in the future.

3.4 Flooding

3.4.1 In order to determine the risk to a site from flooding, areas are divided into specific flood zones which outline the likelihood of flooding being experienced at certain locations. According to the Planning System and Flood Risk Management Guidelines for Planning Authorities, the flood zones are defined as;

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding);
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

3.4.2 DOB&A have reviewed the OPW's national flood information portal – www.floodinfo.ie. A series of maps have been produced by the OPW for areas which are deemed at risk of flooding. There is no historical flooding and the site is significantly elevated above the Liffey and the Mill Race to the west of the site by approximately 20-30m such that pluvial flooding is not a concern. Water in the Liffey is controlled by the Goldenfalls hydroelectric dam and as a result, the subject lands are located in Flood Zone C in accordance with the Flood Risk Management Guidelines. Future serviced site zoning and development on the proposed lands are considered compatible with this flood risk. Fluvial risks will be managed through the implementation of SUDS drainage measures as described in section 3.5.

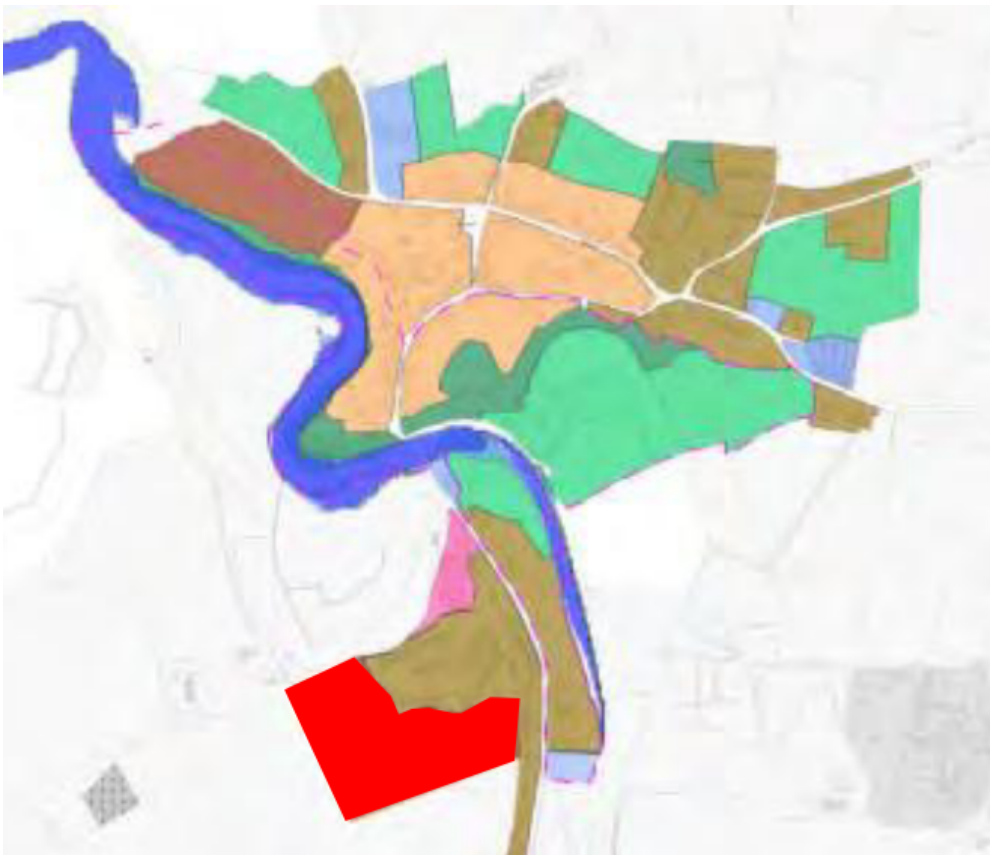


Figure 3: Extract from KCC Strategic Flood Risk Assessment 2017-2023

3.5 Surface Water

3.5.1 The lands in the hinterland of Ballymore Eustace are naturally drained by the river Liffey which runs adjacent to the village to the southwest of the subject site. No open watercourses are evident within the site and it is likely that the existing rainfall runoff discharges naturally to local ditches/field boundaries and falls generally in a westerly direction to an old Mill Race Steam which historically fed the Woollen Mills in Ballymore Eustace. While the Woollen mills are long since gone, the Mill Race is still active as a natural watercourse and continues to be part of the natural and existing hydrological regime which serves the surrounding lands.

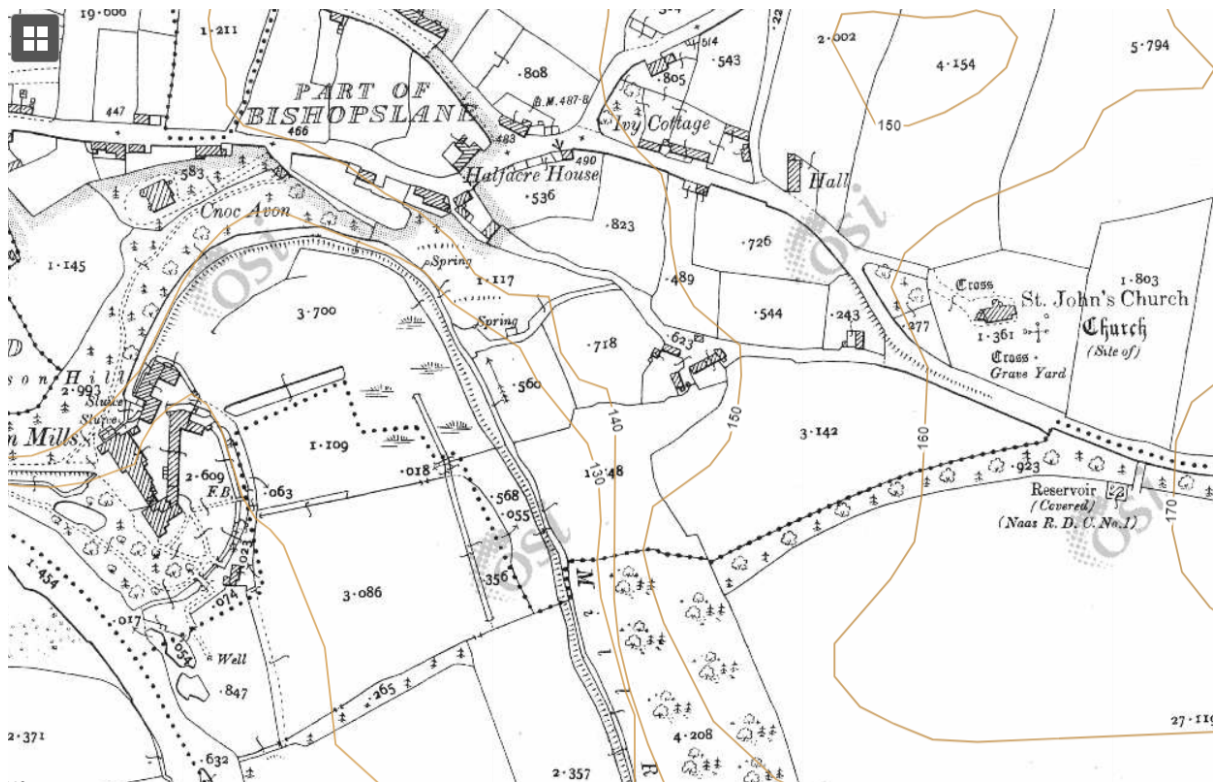


Figure 4: Extract from Historic OSI Mapping shown Mill Race to the west of the subject lands

3.5.2 DOB&A are familiar with the ground conditions generally encountered in Ballymore Eustace. While local variation is likely, soil can be generally expected to be shallow cohesive clay deposits over deep granular deposits. Typically, in this area, we would expect to encounter 1m to 1.5m of brown slightly sandy gravelly silts overlying deep deposits of silty gravelly sand and sandy gravels. Sandy/gravelly soils would typically be suitable for infiltration SuDS drainage techniques above the groundwater level. Obviously, any detailed design on foot of future potential zoning and development would be subject to site investigations and

groundwater monitoring over a prolonged period to assess any seasonal variations. However, the soil types are likely to be positive for implementation of sustainable site drainage discussed in section 3.6 below.

3.6 Surface Water Sustainable Drainage

Normal surface water policy for proposed development must demonstrate compliance with the policies of the Greater Dublin Strategic Drainage Study (2005), in particular those of Sustainable Urban Drainage Systems (SUDS). Our local knowledge of soil conditions indicates that infiltration to ground is likely to be feasible with any balance of storage to be provided by way of sustainable surface water management structures to store a 1 in 100-year flood event + 30% climate change and 10% urban sprawl factors.

The key strategy for SUDs measures for any potential development or usage of the site in Ballymore Eustace are likely to include:

- Discharge from the site will be limited to greenfield runoff rates, Q_{bar} , in accordance with the GSDSDS. This is typically 2l/sec /ha and would approximately equate to a total site discharge of 13.5l/sec from the entire landholding, if fully developed.
- Adaption of sustainable surface water measures as appropriate to the existing soil and groundwater conditions. For a potential low density land use incorporating serviced sites, these would typically incorporate some or all of the following, based on a hierarchical sustainability requirement of Kildare County Council WSD commencing with nature-based solutions, then infiltration, filtration and detention systems.
 - o Blue / green roofs (if appropriate)
 - o Bio swales and bioretention facilities
 - o Rain gardens
 - o Swales and infiltration trenches in open space
 - o Tree pits and associated soakaways
 - o Permeable paving in curtilage of private driveways
 - o Rainwater harvesting
 - o Underground attenuation storage or infiltration trenches for any residual long-term storage for storms up to a 1 in 100-year event (1% Annual Exceedance Probability) + 20% climate change.
 - o Bypass petrol interceptor will be required prior to discharge.

From a preliminary desktop study, it appears that disposal of surface water on this site is feasible, and is unlikely to be an impediment to future development of the lands. The site is naturally draining with gentle slopes westward to the Mill Race stream and Liffey and any future development will mimic natural greenfield

run off rates implementing sustainable surface water management solutions, which are likely to be feasible given the exiting local soil conditions.

3.7 Foul Drainage

Foul drainage maps received from Kildare County Council and Irish Water for the area indicate that there is no existing foul drainage pipe on the subject lands and the nearest public foul draining is located closer to the village along the L2025. As the site is upgradient of the village, in our opinion, there are no particular impediments to achieving a future connection to the existing public drainage in Ballymore Eustace.

In addition, a recent granted permission (21/1643) bounding the subject lands and immediately adjacent to the northwest of the lands has potential to facilitate foul drainage connections through its internal road network. These could be located within the Irish Water wayleave across the 375mm diameter pipe which extends across the adjoining site into our client's lands. And extract form the publicly available drainage drawings on file are included below in Figure 5 below.

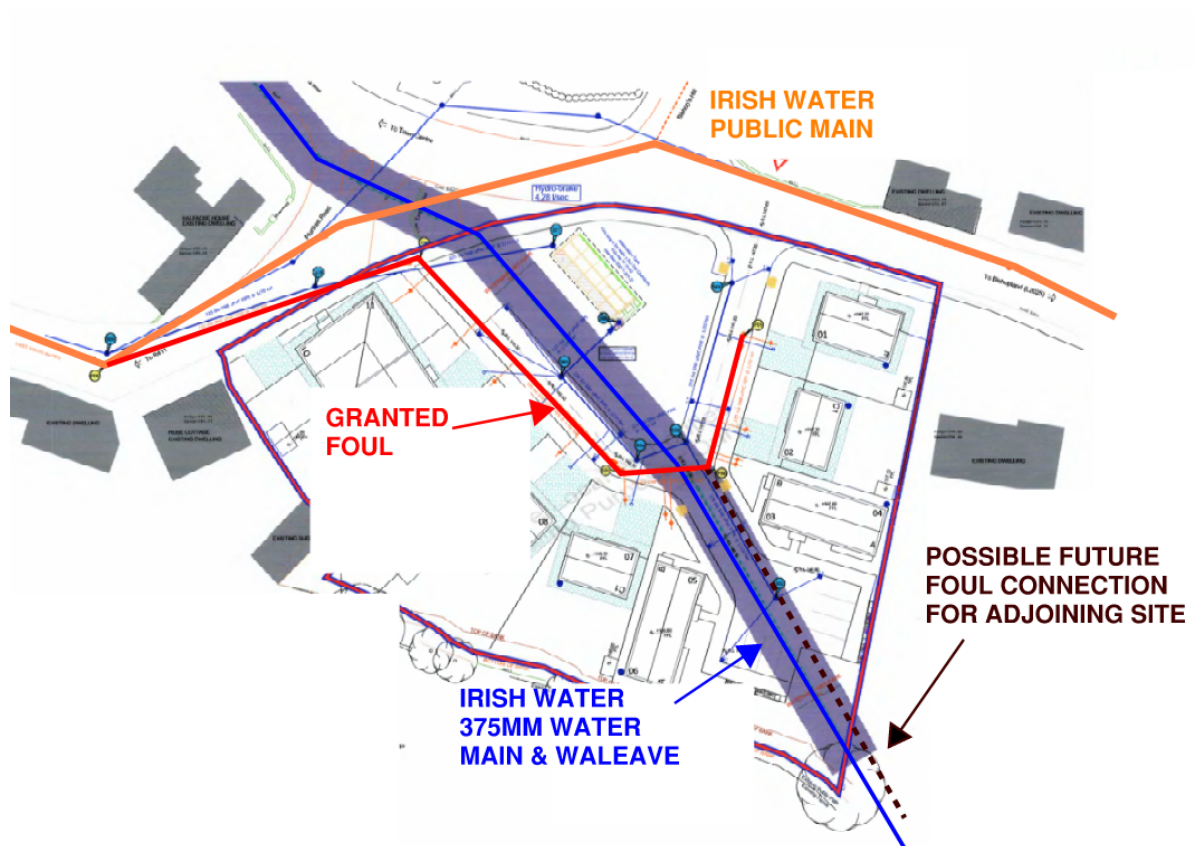


Figure 5: Potential for Foul connection on L2025 or through approved development on adjoining land (KCCRef : 21/1643)

The Ballymore Eustace Wastewater Treatment Plant was upgraded in the recent past and has adequate capacity for future development according to the Kildare County Council Development Plan, and from our enquiries, there are no particular constraints in regard to Foul drainage in Ballymore Eustace.

3.8 Utilities

From a review of available mapping, the lands are not encumbered by utility services. Some overhead lines existing along the L2025, but there are not of a scale or nature that would constrain the future development of the site

4 Conclusions

The site, in our opinion, is ideally located for an infrastructural point of view in Ballymore Eustace for potential future development of a low density residential development for services sites. This report has demonstrated that there are no infrastructural impediments to the provision of future services to the site.

The land owners have had extensive correspondence and communication with KCC Roads and Planning Department in relation to facilitating improved footpath and pedestrian works in the vicinity of the site through implementation of village improvement works. It is understood this will incorporate a safe looped walkway on the portion of road that runs in front of the subject lands, including connectivity improvements from the Irish Water site to Pudding Lane. It is considered that adequate and safe site access and sightlines can be incorporated along the L2025 and that Ballymore Eustace village would benefit from traffic calming associated with extending the 50kph speed zone eastwards and providing a village gateway.

Both foul drainage and watermains are located on the lands or proximate to the lands on public roadways and there are no know Irish Water infrastructural capacity deficiencies in Ballymore Eustace. Any future development can be sustainably drained and the natural drainage regime toward the Mill Race stream and Liffey can be replicated through normal SUDS design benefiting for the existing gravelly soil conditions to implement infiltration and filtration nature-based water management solutions.