Cúirt na Coiribe - Student Residential Development, Galway

Infrastructure Report

Exeter Ireland Property III Limited

Project number: 60588866

24th March 2020

Quality information

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	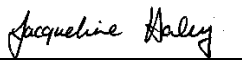	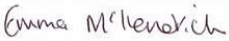	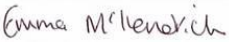
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1. Introduction

Exeter Ireland Property III Limited intend to apply for permission for development at Cuirt na Coiribe Student Accommodation complex, Dún Na Coiribe Road, off Headford Road, Galway on a site measuring 1.414 Ha. AECOM have been commissioned to provide multi-disciplinary consultancy services, including infrastructure design in support of a planning application to Galway City Council for proposed works to an existing student accommodation development (Cúirt na Coiribe) on the Headford Road (N6), Galway. This report has been prepared to accompany the planning application for the proposed extension to the existing complex. Figure 1 illustrates the location of the site relative to Galway City.

Figure 1 – Site Location Relative to Galway City

1.1 Existing Development

The existing development comprises 405 No. student accommodation bedspaces (with summer letting as tourist accommodation) and ancillary floorspace including a restaurant to be retained (172 sq m) in two buildings ranging in height from two to five storeys with a gross floor space of c. 11,128 sq m (plus basement car parking measuring 3,661 sq m).

The existing development consists of two main buildings. 398 of the bed spaces are located in the main building and 7 bedrooms are in the reception/services building. The larger building has a basement and four (plus attic) above ground storeys. The basement includes a 135 space car park and storage rooms. The existing ground floor level is a combination of student accommodation and a restaurant. The remaining floors provide student accommodation. The second building on the site is a two-storey over basement building located along the access road to the site and is ancillary to the Student Accommodation.

The existing levels within the site range from 5.50 to 6.8 m OD Malin. The existing finished ground floor level of the main accommodation building is between 6.79 m OD Malin and 6.83 m OD Malin and the existing basement floor level is 3.25 m OD Malin. The existing finished ground floor level of the reception/ services building is between 6.02 m OD Malin and 6.13 m OD Malin.

The site is bounded by Gort na Coiribe to the north east, Terryland Water Treatment Plant (WTP) to the north west, Dun na Coiribe to the south west and a public road to the south east. Terryland Stream flows close to the public road (approximately 60 m from the road) which provides access to the site. Figure 2 illustrates the location of the development site.

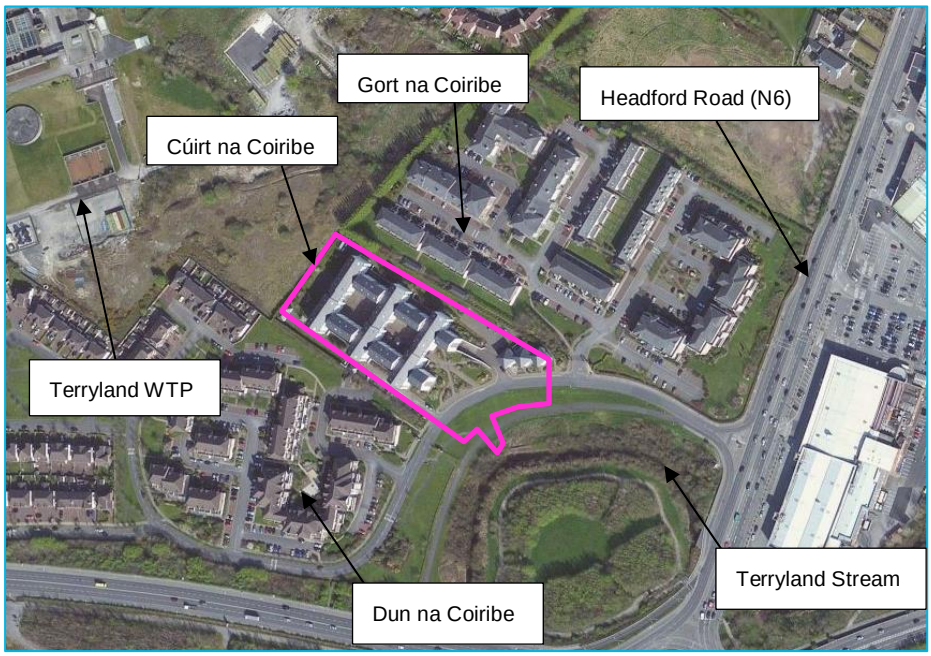

Figure 2 – Site Location

1.2 Proposed Development

The proposed development will consist of: the demolition of the two storey building (582 sq m) at the entrance to the scheme towards the eastern boundary of the site and the removal of the fifth storey (attic) level (1,123 sq m) of the main building; and the provision of horizontal and vertical additions to and extensions of the main existing building providing 920 No. bedspaces (an additional 515 No. student accommodation bedspaces) in 868 No. bedrooms; ancillary student accommodation spaces at basement and ground floor level measuring 1,688 sq m and including gym/fitness studio, games room, library/study spaces, multi-functional spaces, café/restaurant, and student lounge spaces; all provided in a single building in 9 No. linked blocks ranging in height from 2 No. to 6 No. storeys (gross floor space of 24,521 sq m plus basement car-parking and plant (2,615 sq m)).The scheme comprises a total floor area above ground of 22,180 sq m over a basement of 4,956 sq m.

The scheme also proposes 59 No. car-parking spaces (43 No. basement and 16 No. surface spaces); 656 No. cycle parking spaces; 5 No. motorcycle parking spaces; external student amenity spaces; hard and soft landscaping; boundary treatments; plant; diversion of services and all associated works above and below ground.

The proposed building layout is illustrated in Figure 3. Drawings illustrating the existing and proposed layouts have been prepared by TODD Architects and are included with this application.

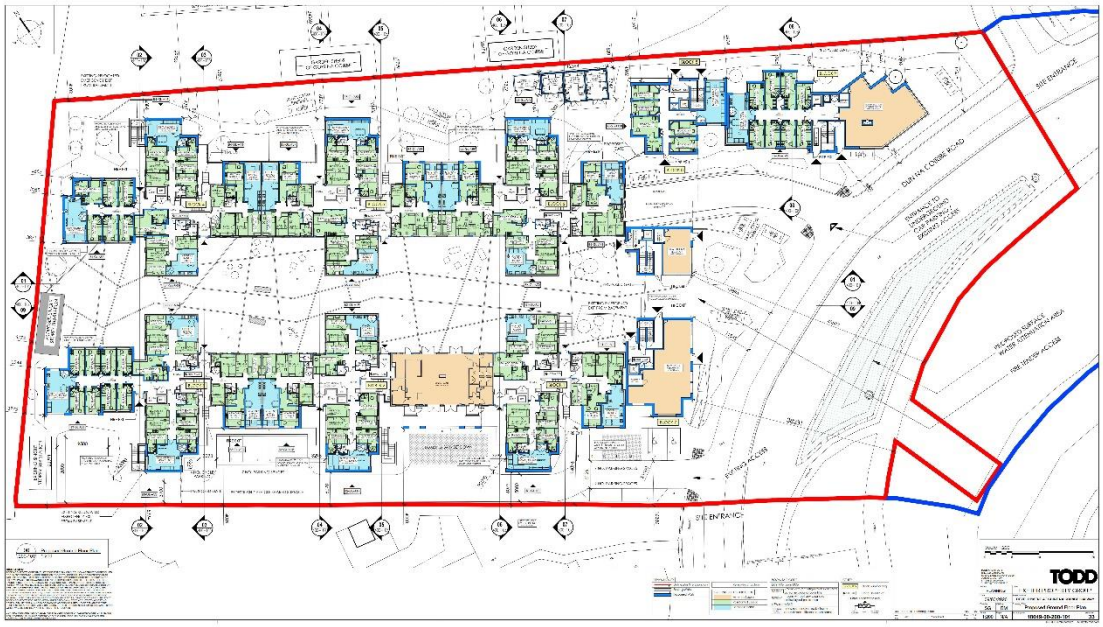

Figure 3 – Proposed Building Layout (Roof Plan)

1.3 Galway City Development Plan (2017 – 2023)

In preparing this Infrastructure Design Report, AECOM have taken cognisance of the Galway City Council Development Plan (2017 - 2023). Of particular relevance to the production of this report are Chapter 9 (Environment and Infrastructure).

1.3.1 Galway CC Development Plan - Flood Risk Assessment Objectives

Policy 9.3 of the Galway City Council Development Plan sets out the objectives regarding Flood Risk Assessment:

- Support, in co-operation with the OPW, the implementation of *EU Flood Risk Directive* (2007/60/EC), the *Flood Risk Regulations* (SI No. 122 of 2010), the DECLG and OPW *Guidelines for Planning Authorities, the Planning System and Flood Risk Management* (2009), updated/ superseding legislation or departmental guidelines and have regard to the findings and relevant identified actions of the future *Corrib Catchment Flood Risk Assessment and Management (CFRAM) Study*, as the study progresses and incorporate these into the Development Plan, where appropriate.
- Have regard to the recommendations of the *Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017 – 2023* in the assessment of development in identified areas of flood risk.
- Restrict the location of structures other than structures with essential links to the waterway and public utilities within 10 metres of the River Corrib in G agricultural zoned lands.
- Protect and promote sustainable management and uses of water bodies and watercourses from inappropriate development, including rivers, stream, associated undeveloped riparian strips, wetlands and natural floodplains.
- Ensure flood risk is addressed in any future local area plans, framework plans and masterplans in the city and have regard to the findings of the Strategic Flood Risk Assessment for Three Local Area Plans 2012 in the preparation of LAPs for Ardaun, Headford Road area, and Murrough.

- Require a site-specific Flood Risk Assessment (FRA) for planning applications in identified areas at risk of flooding, where appropriate, in accordance with the recommendations of the *Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017 – 2023*.
- Facilitate sustainable flood defence and coastal protection works in order to prevent flooding and coastal erosion, subject to environmental, visual and built heritage considerations.
- Ensure any proposal aimed at alleviating flooding will be subject to Appropriate Assessment in accordance with Article 6 of the EU Habitats Directive, where appropriate.
- Ensure the use of SUDS, sustainable urban drainage systems, wherever practical, in the design of development to reduce the rate and quantity of surface water run-off.
- Ensure new development, where appropraite, is desinged and construction to meet the flood design standards outlined under Section 11.27 Flood Risk Management and the recommendations of the *Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017 – 2023*.
- Have regard to the findings of the OPW's *Irish Coastal Protection Strategy Study (2013)* of the west coast.
- Continue to protect the coastal area and foreshore and avoid inappropatie development in areas at risk of coastal erosion and/or would cause and escalate coastal erosion in adjoinig areas.
- Protect and maintain, where feasible, undeveloped riparian zones and natural floodplains along the River Corrib and its tributaries.

1.3.2 Galway CC Development Plan – Water Services Objectives

Policy 9.7 of the Galway City Council Development Plan sets out the objectives regarding Water Services:

- Work in close liaison with Irish Water in the operation of water and waste water facilities in the city and the upgrade and expansion of the network.
- Support the delivery of the objectives in the Irish Water *Water Services Strategic Plan* (2015).
- Provide and maintain a high quality and efficient water supply capable of meeting the needs of the city and ensure continuous supply of high-quality drinking water as agents of Irish Water under the Service Level Agreement.
- Encourage all significant water users to use best practices in water conservation and continue to promote water conservation measures in all new development in the city in liaison with Irish Water.
- Ensure adequate treatment capacity to cater for the future needs of the city in partnership with Irish Water.
- Provide a sustainable and effective wastewater drainage collection and treatment system capable of meeting the needs of domestic, commercial, and industrial users in the city in partnership with Irish Water.
- Identify and prioritise water mains for rehabilitation and reduce water leakage in conjunction with Irish Water in order to conserve the city's water supply.
- Ensure that all new developments have and are provided with satisfactory drainage systems in the interests of public health and to avoid the pollution of ground and surface waters.

1.3.3 Galway CC Development Plan – Sustainable Urban Drainage Systems (SUDS) Objectives

Policy 9.8 of the Galway City Council Development Plan sets out the objectives regarding Sustainable Urban Drainage Systems:

- Ensure the use of Sustainable Urban Drainage Systems (SUDS) and sustainable surface water drainage management, wherever practical in the design of development to enable surface water run-off to be managed as near to its source as possible and achieve wider benefits such as sustainable development, water quality, biodiversity and local amenity.
- Proposals for Sustainable Urban Drainage Systems (SUDS) should include provisions for the long term management, operation and maintenance of these systems.

1.4 Pre-Planning Meeting with GCC

During the pre-planning meeting held on 5th December 2018, Frank Clancy (Water Services Engineer) advised that Terryland Stream is slow moving and discharges to a swallow hole. However, long term there is an aspiration to increase flow in the river, therefore attenuating flows might not be required long term.

1.5 Summary

This report provides descriptions of the wastewater drainage, surface water drainage and water supply network proposed to serve the development and the site constraints considered as part of the preliminary design.

1.5.1 Surface Water

It is proposed to provide a separate surface water drainage network and divert sections of the existing surface water drainage network where required to accommodate the extended development. It is also proposed to provide surface water attenuation and a Class I By Pass Hydrocarbon Separator. Please refer to Section 2 and AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-0501 for further details of the proposed surface water drainage design and layout.

1.5.2 Wastewater

It is proposed to divert sections of the existing wastewater drainage network where required. Wastewater generated by the proposed development will be discharged to the Irish Water infrastructure as per the existing arrangement. Please refer to Section 3 and AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-0501 for further details of the proposed wastewater drainage design and layout.

1.5.3 Water Supply

It is proposed to divert sections of the existing watermain where required. New sections of watermain within the site will be 150 mm diameter PE. Please refer to Section 4 and AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-2701 for further details of the proposed watermain design and layout.

1.5.4 Flood Risk Management

A Site-Specific Flood Risk Assessment has been prepared to accompany this application which addresses the requirements of the Galway City Development Plan 2017-2023.

2. Surface Water Drainage

2.1 Existing Surface Water Drainage

The existing site is served by a separate surface water drainage network which collects surface water run-off generated within the site and conveys flows to an existing outfall to the Terryland River. The approximate location of the existing outfall to the river is shown in Figure 4. The existing network layout is illustrated on PR354607-ACM-XX-00-DR-CE-10-0501. There are no existing attenuation tanks/ ponds or hydrocarbon separators on the existing surface water drainage network.

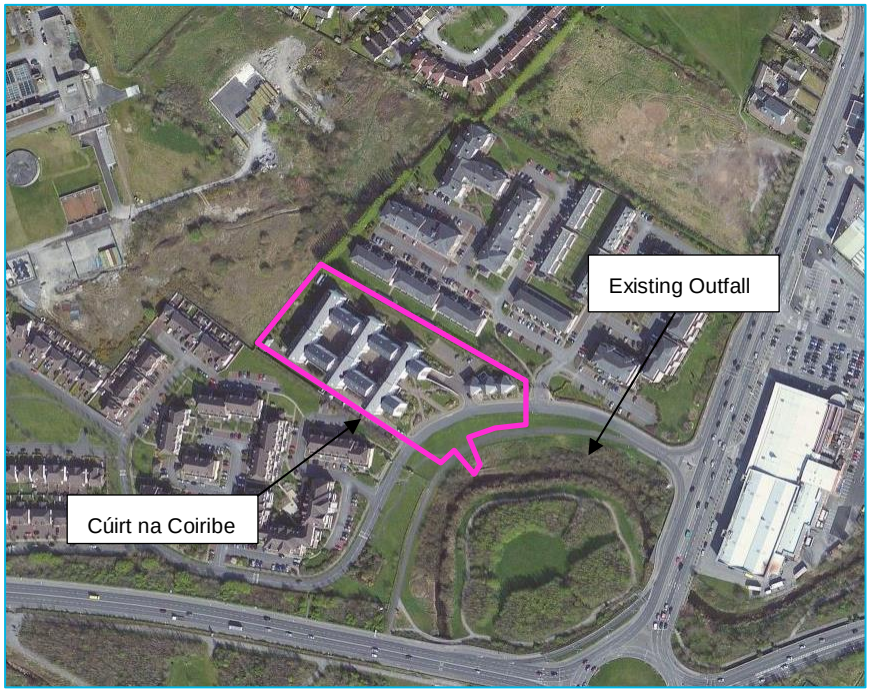

Figure 4 – Existing Surface Water Outfall

2.2 Proposed Surface Water Drainage

As part of the proposed extension to the existing development, diversion works will be required on the existing surface water drainage network. New sections of surface water drainage network will also be required within the extent of the existing site.

The diverted and new sections of surface water drainage network will be piped gravity systems. Run-off will be collected by gullies.

While there is currently no surface water attenuation associated with the existing development, it is proposed to limit discharge from the site to a greenfield rate and as such a storage area is proposed as shown on Drawing PR354607-ACM-XX-00-DR-CE-0501.

In addition to providing this storage area, it is proposed to provide a Class I Bypass Hydrocarbon Separator to treat run-off for possible hydrocarbon contamination prior to discharge to the Terryland River.

2.2.1 Design Criteria

The design of residential developments would normally be based on Section 3.5 of the Department of Environment, Heritage and Local Government Recommendations for Site Development Works for Housing Areas and the requirements of Galway City Council.

The following design standards and guidelines have been followed in the design of the proposed surface water drainage network for the site:

- BS EN 752 – Drains and sewer system outside buildings.
- Greater Dublin Strategic Drainage Study (GDSDS) Volume 2 – New Developments.
- BS EN 858-2 – Separator System for Light Liquids (e.g. oil and petrol).
- Pipe network has been designed to ensure no surcharging during a 1 in 5-year return period rainfall event.
- No pipe flooding during a 1 in 100-year return period rainfall event.
- Surface water storage sized based on a 1 in 30-year return period rainfall event.
- An additional 20% has been allowed for climate change in relation to rainfall intensities.
- The following design criteria have been used in the design of the proposed surface water drainage network:
    - Carrier pipe network – 1.0m/s to 3.0m/s.
    - Colebrook White roughness value of 0.6mm for all pipework.
    - Time of entry: 4 minutes.
    - Return Period: 5 years.
    - Met Eireann rainfall data for site.
    - M5/60 = 17.4 mm.
    - Ratio r = 0.3.

Please refer to Appendix A for calculations and to AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-0501 for more information on the surface water network.

2.3 Surface Water Attenuation

The document 'The SuDS Manual' published by CIRIA Document No. C753, was utilised for the management of surface water run-off within the development. This document promotes the use of a variety of alternative measures in the design of sustainable drainage systems, which taken in to account quantity, quality and amenity. SuDS encourages the use of soft systems that replicate as far as possible, the natural treatment of surface water and attenuation storage to manage surface water run-off.

As stated above, run-off from the site will be limited to a pre-development greenfield run-off rate. This rate has been calculated in accordance with the GDSDS and is based on the following equation and inputs:

$$Qbar_{rural} = 0.00108A^{0.89}SAAR^{1.17}SOIL^{2.17}$$

Table 1. Greenfield Discharge Rate

Area (ha)	SAAR (mm)	SOIL	Q_{bar} (l/s)
1.13739	1163	4 (clayey/ poorly drained)	9.05

To store run-off in excess of this flow rate, it is proposed to provide a wetland in the green area to the east of the development site as set out within the CIRIA C753 document. Wetlands are features with a permanent pool of water that provide both attenuation and treatment of surface water runoff. They can support emergent and submerged aquatic vegetation which helps enhance treatment processes and has amenity and biodiversity benefits. The proposed wetland is to be enclosed with a fence to prevent any threat to locals or animals falling into the wetland. Mature hawthorn bushes are specified on either side of a post and rail fence. There will be a gated entry provided to allow for maintenance of the wetland. Water signage and a lifebuoy will also be required.

Attenuation storage is provided above the permanent pool and wetland areas. A hydro-brake installed at the outflow controls the rates of discharge from the pool which is limited to the greenfield runoff rate (QBar). The storage area has been sized based on the volume required (137.2 m³) to store run-off from the development site during a 1 in 30-year return period rainfall event. A 20% increase in rainfall intensities as a result of the impacts of climate changes has also been incorporated in this design. A freeboard of 200mm is also catered for within the design. Please see Drawing PR354607-ACM-XX-00-DR-CE-0501 and Drawing PR354607-ACM-XX-00-SK-CE-0009. The planting within the wetland is to be specified as per the Landscape Architect's requirements.

As noted in Section 1.4, long term there may be a desire to increase flows in Terryland Stream, in which case there may not be a requirement to attenuate flows in the long term.

3. Wastewater Drainage

3.1 Existing Wastewater Drainage

The existing development is served by a separate gravity wastewater drainage network.

3.1.1 Background

As part of the development of Dun na Coiribe, Cúirt na Coiribe and Gort na Coiribe a Memorandum of Agreement was made on 26th November 1996 between the owners of Dún na Coiribe (Foxfield Inns Limited – Flannery), Cúirt na Coiribe (Kenny Investments Limited - Kenny) and Gort na Coiribe (Joseph Keating) with a view to providing a common wastewater (foul) sewer as follows:

"The extension of the foul sewer from the southern side 9of the Headford Road across via pipe-jack to the north side of Headford Road, then parallel to the Headford Road and along the proposed entrance road through Dún na Coiribe and Cúirt na Coiribe to terminate in an access chamber 5 metres inside Keating's lands (Gort na Coiribe)."

The following were also noted in this Memorandum of Agreement regarding maintenance and wayleaves associated with the proposed road and services:

> *"7. Until the said road and services have been taken in charge they will be maintained jointly by Flannery (Dún na Coiribe), Kenny (Cúirt na Coiribe) and Keating (Gort na Coiribe) in the proportions Flannery 3.84%, Kenny 25.58%, and Keating 70.58% and corresponding to commencement of use by the respective parties."*
>
> *"8. Flannery shall grant to Kenny and Keating and Kenny shall grant to Flannery and Keating a right of way and wayleave over the said road and services which rights shall be appurtenant to all of the lands in Terryland now owned by Kenny and all of the lands in Terryland now owned by Keating and all of the lands owned by Flannery."*

A copy of the Memorandum of Agreement (26th November 1996) is included in Appendix B.

3.1.2 Irish Water Pre-Connection Enquiry

A Pre-Connection Enquiry Form was submitted to Irish Water. Irish Water provided a Confirmation of Feasibility letter on 10th January 2019 (Included in Appendix C). This letter noted the following in relation to the wastewater drainage network:

"Cúirt na Coiribe is currently served by a private sewer network and pumping station which then ultimately connects to the Irish Water public network. The private pumping station also serves Gort na Coiribe. You will require permission to connect to the private wastewater infrastructure from its owners. You will also assess and confirm that the private infrastructure has capacity and is operationally and structurally adequate to cater for the proposed development demands. You will require to ensure that the proposed loading to the existing private pumping station and rising main does not cause any septicity issues to the IW network. Evidence in relation to the above will required to be provided prior to connection application stage. The feasibility feedback assessment undertaken as part of this pre-connection enquiry relates only to the capacity of the existing Irish Water network to cater for the proposed development loadings."

The existing wastewater drainage network is illustrated on AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-0501.

3.1.3 CCTV Survey

A CCTV survey of the existing wastewater drainage network within Cúirt na Coiribe was carried out to confirm the pipe routes and confirm the condition of the existing network. The existing network was found to be in good condition.

The main line wastewater sewer outfalls to a pumping station in Gort na Coiribe through a series of manholes close to the pumping station. There is no overflow capacity in the system and the pump station is constructed with 6-meter concrete rings with two pumps operating on float switches.

3.2 Proposed Wastewater Drainage

It is proposed to divert sections of the existing wastewater drainage network within Cúirt na Coiribe, where required. A section of the existing network within Cúirt na Coiribe conveys wastewater generated by Dun na Coiribe, downstream to the existing pumping station in Gort na Coiribe. It is proposed to provide a new gravity sewer in the road to collect wastewater from Dun na Coiribe.

In addition, it is proposed to provide a new wastewater pumping station and 24-hour storage tank to serve Cúirt na Coiribe only. The pumping station and rising main will discharge wastewater to the new gravity sewer in the roadway.

Wastewater generated by the proposed development will continue to discharge to the existing pumping station within Gort na Coiribe, however the required storage for the proposed development will be available within the site extent. The proposed drainage network has been designed using Micro Drainage software in accordance with the Irish Water Code of Practice for Wastewater Infrastructure.

3.2.1 Wastewater Loading

A pre-connection enquiry application was submitted to Irish Water (IW) to determine if there is capacity within the existing Irish Water wastewater infrastructure to cater for the increased load associated within the increase in residents.

The Dry Weather Flow (DWF) has been calculated as 1.658 l/s while the peak daily flow (taken as 6 times the Dry Weather Flow) has been calculated as 9.95 l/s.

The proposed wastewater drainage network has been designed to achieve self-cleansing velocities of 0.75 m/s, as set out in Section 3.6 of the Code of Practice. The proposed network has been designed to convey between 2.5 and 6 times the DWF.

Please refer to Appendix D for the Statement of Compliance provided by Irish Water.

3.2.2 Wastewater Network Design

The following design standards and guidelines have been followed in the design of the proposed wastewater drainage network for the site:

- Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03),
- BS EN 752 – Drains and sewer systems outside buildings,
- Sewers for Adoption, 6th Edition,
- Micro Drainage Software Pipeline Design,
- All pipework will be provided at gradients that will provide velocities in the range of 0.75 m/ sec and 2.5 m/sec, when flowing half full,
- Part H Building Regulations.

Please refer to the AECOM Drawing No. PR354607-ACM-XX-00-DR-CE-10-0501 and Appendix E for more information on the wastewater drainage network design calculations.

4. Water Supply

4.1 Existing Water Supply Network

The existing development is supplied by an existing 100 mm uPVC watermain in the public road. An existing 110 mm diameter watermain loops the existing building feeding each block. The existing water supply network within the site is shown on AECOM Drawing PR354607-ACM-XX-00-DR-CE-10-2701.

A Pre-Connection Enquiry Form was submitted to Irish Water. Irish Water provided a Confirmation of Feasibility letter on 10th January 2019. This letter noted the following in relation to the water supply network:

"Cúirt na Coiribe is currently served by its own private watermain network which ultimately connects to the Irish Water 200 mm diameter watermain which runs along the main Cúirt na Coiribe/ Gort na Coiribe spine access road. You will also assess and confirm that the private infrastructure serving Cúirt na Coiribe has capacity and is operationally and structurally adequate to cater for the proposed development demands. Evidence in relation to the above will require to be provided prior to the connection application stage. The feasibility feedback assessment undertaken as part of this pre-connection enquiry relates only to the capacity of the existing Irish Water network to cater for the proposed development demands. The confirmation of feasibility to connect to the Irish Water infrastructure does not extend to you fire flow requirements. To guarantee a flow to meet the Fire Authority requirements you should provide adequate fire storage capacity within your development."

4.1.1 Fire Flow Simulation Test

A Fire Flow Simulation Test was carried out on the existing water distribution network to determine the maximum fire-flow capacity of the existing network and to measure impact this flow has on the hydraulic capacity of the network.

Two fire hydrants were selected for 7-day pressure monitoring; one within Cúirt na Coiribe (FH-B) and one at Dun na Coiribe (FH-A). The flow testing was carried out on 24th May 2019.

- The maximum fire flow capacity recorded on fire hydrant FH-B was 1,537 litres/ minute (25.6 l/s), with a residual pressure of 41.5 m.
- The maximum fire flow capacity recorded on fire hydrant FH-A was 990 litres/ minute (16.5 l/s), with a residual pressure of 37.4 m.

4.2 Proposed Water Supply Network

It is proposed to provide a new 150 mm diameter PE watermain within the development site to serve the existing and proposed residential blocks.

The internal water supply network is based on the Department of the Environment 'Recommendations for Site Development Works', the requirements of Irish Water and the Technical Guidance Document – Part B of the Building Regulations 2006:

- The development shall have a bulk water meter (location to be agreed with Irish Water) in accordance with Irish Water Code of Practice for Water Infrastructure Section 3.15.4.
- All apartments and similar properties shall have meters installed internally within the premises in accordance with the Building Control Authority's requirements and subject to review by Irish Water as per Irish Water Code of Practice for Water Infrastructure Section 3.15.2.
- Hydrants are positioned within 46 m of the proposed buildings.
- Sluice valves are positioned to isolate the watermain.
- Air valves are proposed at high points within the internal water supply network.

- Scour valves are proposed at low points within the internal water supply network.

To further reduce the water demand on the public water supply infrastructure and to reduce the load on the public wastewater infrastructure, water conservation measures will be incorporated in the sanitary facilities through the development, e.g. dual flush toilets.

The proposed water supply network is shown on AECOM Drawing PR354607-ACM-XX-00-DR-CE-10-2701. Please refer to Appendix D for the Statement of Compliance provided by Irish Water.

5. Access and Traffic

The existing access to the development and car park will be maintained as part of the proposed development. Please refer to AECOM Drawing PR354607-ACM-00-XX-DR-CE-10-0101 for the location of the access and Drawing PR354607-ACM-00-XX-DR-CE-10-0102 for the swept path analysis carried out.

Please refer to the AECOM Traffic and Transport Assessment and Mobility Management Plan reports for further information on site accessibility.

6. Flood Risk Assessment

As part of the preliminary design of the proposed development, AECOM prepared a site-specific Stage 2 Flood Risk Assessment which describes the flood risks to the site and addresses the requirements of Galway City Development Plan (2017 – 2023). This FRA has been prepared in accordance with the *Planning System and Flood Risk Management Guidelines*, (OPW, 2009).

Appendix A Surface Water Drainage Network

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	17.200	Add Flow / Climate Change (%)	20
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	200	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.193	4-8	0.773	8-12	0.012

Total Area Contributing (ha) = 0.978

Total Pipe Volume (m³) = 48.395

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	9.213	0.061	150.0	0.090	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	19.683	0.087	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	4.692	0.039	120.3	0.058	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	17.511	0.088	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	72.17	4.14	5.100	0.090	0.0	0.0	3.5	1.07	42.4	21.2
S1.001	69.97	4.52	5.039	0.090	0.0	0.0	3.5	0.87	34.5	21.2
S2.000	72.65	4.07	4.810	0.058	0.0	0.0	2.3	1.19	47.3	13.8
S1.002	68.25	4.84	4.771	0.149	0.0	0.0	5.5	0.92	36.6	33.0

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.000	4.857	0.032	150.0	0.060	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	13.148	0.058	225.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	2.703	0.018	150.0	0.059	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	20.313	0.090	225.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.000	4.274	0.028	150.0	0.061	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.005	12.958	0.052	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	5.464	0.036	150.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	25.889	0.104	250.0	0.100	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.007	33.005	0.174	190.0	0.064	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.000	11.664	0.058	200.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S8.000	8.162	0.054	150.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.000	72.58	4.08	4.650	0.060	0.0	0.0	2.3	1.07	42.4	14.1
S1.003	67.17	5.05	4.543	0.208	0.0	0.0	7.6	1.04	73.8	45.5
S4.000	72.79	4.04	4.550	0.059	0.0	0.0	2.3	1.07	42.4	14.0
S1.004	65.58	5.37	4.457	0.268	0.0	0.0	9.5	1.04	73.8	57.1
S5.000	72.64	4.07	4.390	0.061	0.0	0.0	2.4	1.07	42.4	14.4
S1.005	64.55	5.59	4.287	0.329	0.0	0.0	11.5	0.99	70.0	69.0
S6.000	72.53	4.09	4.700	0.000	0.0	0.0	0.0	1.07	42.4	0.0
S1.006	62.87	5.97	4.160	0.429	0.0	0.0	14.6	1.14	126.1	87.7
S1.007	61.13	6.39	4.056	0.494	0.0	0.0	16.4	1.31	144.8	98.1
S7.000	71.77	4.21	5.000	0.000	0.0	0.0	0.0	0.92	36.6	0.0
S8.000	72.27	4.13	5.000	0.000	0.0	0.0	0.0	1.07	42.4	0.0

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S7.001	14.415	0.096	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.000	3.723	0.025	150.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S9.001	13.318	0.067	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	14.415	0.072	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	33.330	0.133	250.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S10.000	9.052	0.060	150.0	0.076	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	14.329	0.072	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S11.000	2.990	0.020	150.0	0.067	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	20.886	0.093	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S12.000	3.678	0.025	150.0	0.048	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	12.544	0.050	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.000	3.856	0.026	150.0	0.065	4.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S7.001	70.46	4.44	4.942	0.000	0.0	0.0	0.0	1.07	42.4	0.0
S9.000	72.69	4.06	4.500	0.000	0.0	0.0	0.0	1.07	42.4	0.0
S9.001	71.25	4.30	4.475	0.000	0.0	0.0	0.0	0.92	36.6	0.0
S7.002	69.01	4.70	4.409	0.000	0.0	0.0	0.0	0.92	36.6	0.0
S1.008	59.25	6.88	3.882	0.494	0.0	0.0	16.4	1.14	126.1	98.1
S10.000	72.19	4.14	5.200	0.076	0.0	0.0	3.0	1.07	42.4	17.8
S10.001	70.66	4.40	5.140	0.076	0.0	0.0	3.0	0.92	36.6	17.8
S11.000	72.76	4.05	5.000	0.067	0.0	0.0	2.7	1.07	42.4	16.0
S10.002	68.45	4.80	4.980	0.144	0.0	0.0	5.3	0.87	34.5	31.9
S12.000	72.70	4.06	4.800	0.048	0.0	0.0	1.9	1.07	42.4	11.3
S10.003	67.35	5.01	4.700	0.191	0.0	0.0	7.0	0.99	70.0	41.9
S13.000	72.68	4.06	4.510	0.065	0.0	0.0	2.6	1.07	42.4	15.4

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S10.004	20.812	0.083	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S14.000	4.426	0.030	150.0	0.061	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.005	17.907	0.072	250.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S15.000	5.783	0.039	150.0	0.035	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.006	11.920	0.074	160.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S10.007	48.735	0.195	250.0	0.131	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	18.354	0.073	250.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S16.000	50.257	0.223	225.0	0.000	4.00	0.0	0.600	o	225	Pipe/Conduit	
S16.001	12.973	0.065	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	16.657	0.111	150.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.011	50.494	0.202	250.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.012	26.408	0.117	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S10.004	65.62	5.36	4.409	0.257	0.0	0.0	9.1	0.99	70.0	54.7
S14.000	72.63	4.07	4.340	0.061	0.0	0.0	2.4	1.07	42.4	14.5
S10.005	64.22	5.67	4.235	0.318	0.0	0.0	11.1	0.99	70.0	66.4
S15.000	72.50	4.09	4.290	0.035	0.0	0.0	1.4	1.07	42.4	8.2
S10.006	63.50	5.83	4.164	0.353	0.0	0.0	12.1	1.24	87.6	72.8
S10.007	60.54	6.54	4.015	0.484	0.0	0.0	15.9	1.14	126.1	95.3
S1.009	58.38	7.11	3.674	0.978	0.0	0.0	30.9	1.28	203.8	185.6
S16.000	67.59	4.97	4.000	0.000	0.0	0.0	0.0	0.87	34.5	0.0
S16.001	66.41	5.20	3.777	0.000	0.0	0.0	0.0	0.92	36.6	0.0
S1.010	57.79	7.28	3.000	0.978	0.0	0.0	30.9	1.66	263.6	185.6
S1.011	55.60	7.94	2.889	0.978	0.0	0.0	30.9	1.28	203.8	185.6
S1.012	70.06	4.51	2.687	0.000	9.0	0.0	1.5	0.87	34.5	9.0

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.012	S	3.049	2.570	1.650	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	17.200	Storm Duration (mins)	30
Ratio R	0.300		

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Appendix B Memorandum of Agreement

1.1

RANDUM OF AGREEMENT made the 26th day of November, 1996

BETWEEN FOXFIELA INNS LIMITED of Imperial Hotel, Eyre Square, Galway (hereinafter called "Flannery") of the First Part KENNY INVESTMENTS LIMITED having its registered office at Ros Ard, Cappagh Road, Galway (hereinafter called "Kenny") of the Second Part and JOSEPH KEATING of Dyke Road, Terryland, Galway (hereinafter called "Keating") of the Third Part WHEREBY IT IS AGREED as follows;

1. Flannery, Kenny and Keating agree with the other and others jointly and severally to undertake the development of certain lands at Terryland, Galway with a view to providing the following common services;

(a) The extension of the foul sewer from the southern side of the Headford Road across via pipe-jack to the North side of Headford Road, then parallel to the Headford Road and along the proposed entrance road through Flannery's and Kenny's lands to terminate in an access chamber 5 metres inside Keatings lands.

(b) The formation of an entrance to Galway Corporation and National Roads Authority approval entailing central median, deceleration/acceleration lanes and the formation of the entrance road through Flannerys and Kennys lands terminating 5 metres inside the boundary of Keating's lands.

(c) The laying and construction of services required for the development (for the purposes intended) of the parties' respective lands inclusive of storm water drainage, watermain and ducting for ESB, Telecom and Cable Television.

The parties shall procure to be obtained such wayleaves as are required to be granted by any third parties.

3. Patrick J. Tobin & Co. Limited, Consulting Civil and Structural Engineers, Hynes Buildings, St. Augustine Street, Galway (hereinafter called "Tobins") shall be employed by the parties to act in supervising and certifying in relation to the said works (but excluding those undertaken by Galway Corporation as per paragraph 5 hereunder) firstly the structural integrity of the works and secondly the payments due. The said works shall be undertaken and completed in accordance with Drawings, Plans and Specifications prepared by Tobins.

4. The parties authorise Tobins to apply for Planning Permission for the said works. Each of the parties consents to Planning Permission being sought for the proposed works and this agreement is subject to the Grant of said Planning Permission specifically in accordance with the entrance road position and land take as shown on the attached Drawing Number 702272/3c to be signed by the parties. Each of the parties confirms having the appropriate legal estate or interest to entitle the application to be made seeking the relevant Planning Permission.

5. The parties agree to procure that Galway Corporation shall undertake at the expense of the parties hereto the completion of the works on the lands shaded green on the map attached and detailed on the Drawing Number 702272/3c on the basis that the boundary of the lands to be initially taken in charge will be the line of the back of

the proposed path parallel to the Headford Road.

6. Flannery and Kenny agree to transfer to Galway Corporation the land on which the road and services are to be constructed (including the road and services) or to the formal taking in charge of the same (immediately following the completion of their construction) and their execution hereof shall constitute their consent to the taking thereof in charge and they hereby grant Keating a Power of Attorney to apply on their behalf to Galway Corporation to have the said road and services taken in charge.

7. Until the said road and services have been taken in charge they will be maintained jointly by Flannery, Kenny and Keating in the proportions Flannery 3.84%, Kenny 25.58%, and Keating 70.58% and corresponding to commencement of use by the respective parties.

8. Flannery shall grant to Kenny and Keating and Kenny shall grant to Flannery and Keating a right of way and wayleave over the said road and services which rights shall be appurtenant to all of the lands in Terryland now owned by Kenny and all of the lands in Terryland now owned by Keating. and all of the lands owned by Flannery

9. It is recognized that in determining and agreeing the extent of the parties commitments and obligations herein, account has been taken of the land take from Flannery and Kenny (by way of lands to be transferred to Galway Corporation to implement the terms of this agreement), for which they shall not receive any further or other compensation or consideration.

10. Flannery and Kenny warrant that they hold good and marketable title to their respective lands through which the road and services are to be laid.

11. On the execution of this Agreement Flannery shall pay £15,000.00, Kenny shall pay £100,000.00 and Keating shall pay £276,000.00 into an account in AIB Bank, 18 Eyre Square, Galway with John Hughes, Branch Manager, being the nominated signatory for the purposes of the operation of the account with a view to providing the funds to discharge the costs and expenses incidental to this Agreement and the undertaking and completion of the foregoing works. The engineering fees (of Patrick J. Tobin & Co. Limited) attributable to the Contract will be on the basis of the Minister for the Environment scale of fees. Should the monies in the account exceed the actual cost, the parties shall be refunded monies in the proportions 3.84% for Flannery, 25.58% for Kenny and 70.58% for Keating. Should the monies in the account be insufficient to discharge the actual cost, the short fall shall be borne as to 100% by Keating. The AIB Bank Account (above referred to) shall be operated by the said John Hughes with a view to discharging the monies properly due and payable as they fall due for payment from time to time and on the certification of Patrick J. Tobin & Co. Limited.

12. Patrick J. Tobin & Co. Limited shall immediately following the Grant of Planning Permission be authorised to initiate a tendering procedure and to nominate a Contractor.

13. This Agreement shall be binding upon the parties hereto and (as the case may be) their Legal Personal ~~Representatives and Assigns~~ or their Successors and Assigns.

IN WITNESS whereof the seals of the parties were affixed hereto and Keating has hereunto signed his name and day and year first herein written.

PRESENT when the Common Seal of

FORFIELD INVST LTD.

was affixed hereto:-

Francis Flannery

PRESENT when the Common Seal of

KENNY INVESTMENTS LTD

~~was affixed hereto:-~~

John Kenny.

SIGNED SEALED AND DELIVERED

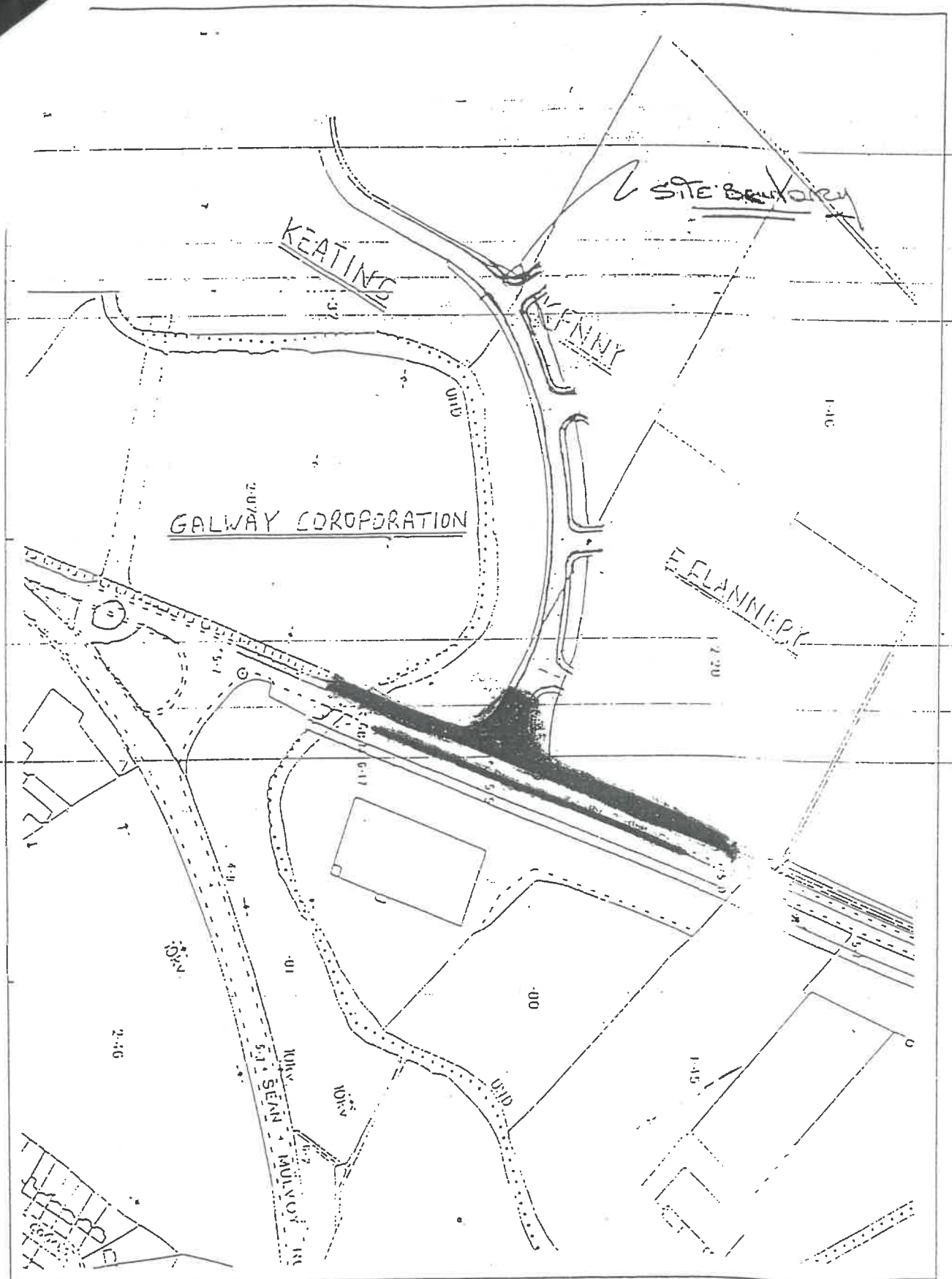
by the said ~~EILEEN KEATING~~

~~and~~ JOSEPH KEATING

in the presence of:-

Joe Keating.

1.6



PATRICK J TOBIN & Co
CONSULTING ENGINEERS
22 EYRE SQUARE GALWAY
IRELAND TEL - (091:65211)

HEADFORD ROAD ENTRANCE
SITE LOCATION MAP.

SUFFIX	REVISION	DATE	INL
A	LAYOUT REV	OCT96	B.H.
B	LAYOUT REV	OCT96	B.H.

SCALES 1:2500

DRAWN B.H.

CHECKED J.P.K.

DRG. NO. 3 02/149/20 B

JOH 13136

2.1.

MEMORANDUM OF AGREEMENT made the 6th day of February 1997 BETWEEN FOXFIELD INNS LIMITED of Imperial Hotel, Eyre Square, Galway (hereinafter called "Flannery") of the First Part KENNY INVESTMENTS LIMITED having its registered office at Ros Ard, Cappagh Road, Galway (hereinafter called "Kenny") of the Second Part and JOSEPH KEATING of Dyke Road, Terryland, Galway (hereinafter called "Keating") of the Third Part WHEREBY IT IS AGREED as follows;

1. This Agreement is supplemental to an agreement between Flannery, Kenny and Keating entered into on 26th November 1996 (hereinafter called "the Principal Agreement").
2. The parties agree that Paragraphs 4 and 5 of the Principal Agreement shall be amended by the substitution for Drawing Number 702272/3c of the new Drawing being Drawing Number 702272/3d and by the substitution of Drawing /02/149/20B attached to the Principal Agreement of the Drawing Number 702/149/20C attached hereto.
3. In all other respects the parties confirm the Principal Agreement.

IN WITNESS whereof the seals of the parties were affixed hereto and Keating has hereunto signed his name and day and year first herein written.

PRESENT when the Common Seal of

FOXFIELD INNS LIMITED

was affixed hereto:-

F. Flannery.

M. [illegible]

2.2

PRESENT when the Common Seal of

KENNY INVESTMENTS LIMITED

was affixed hereto:-

John Kenny

SIGNED SEALED AND DELIVERED

by the said JOSEPH KEATING

in the presence of:-

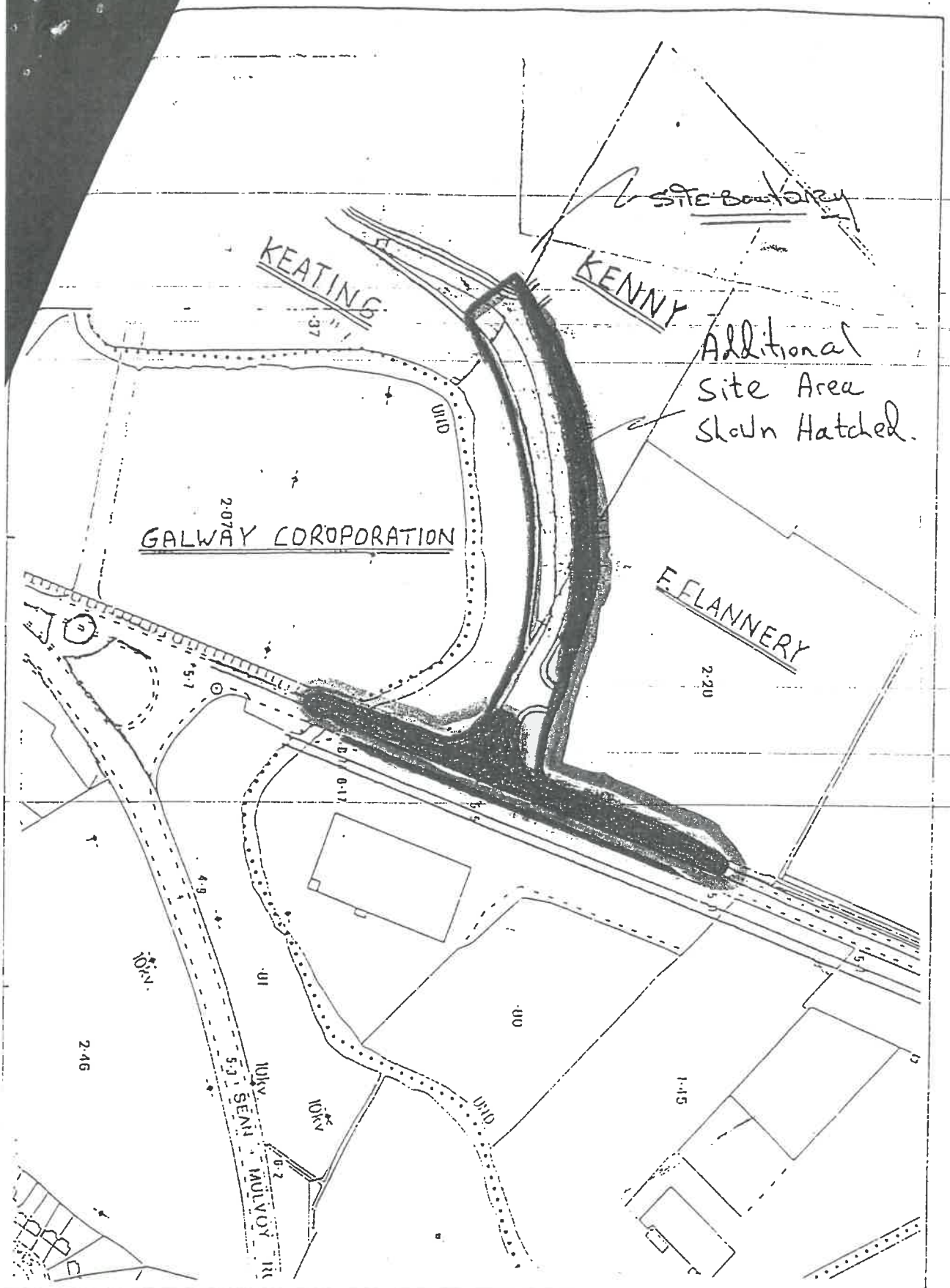
Joe Keating

[illegible]

[illegible]

Galway

2.3



PATRICK J TOBIN & Co
CONSULTING ENGINEERS
22 EYRE SQUARE GALWAY
IRELAND TEL- (091:65211)

HEADFORD ROAD ENTRANCE
SITE LOCATION MAP.

REVISION	DATE	INL	SCALES	DRAWN	CHECKED	DATE	DRG. NO.
OUT REV	OCT96	E.L.	1:2500	B.H.	J.P.K.	JAN'97	702/149/20.C.
REV	OCT96	JPK					
REV	JAN97	B.H					

3.1.

LEWIS C. DOYLE & CO.

Lewis C. Doyle BCL

Karina Doyle B.A. L.L.B

[illegible] Sheehan B.A. L.L.B

Solicitors,
AUGUSTINE COURT,
ST. AUGUSTINE STREET,
GALWAY.

DX 4003 Galway.

Telephone: 091-565677.
Fax: 091-565689.
E-mail: lcd@tinet.ie

Your Ref:
Our Ref: LCD/NF/48940

Date: 30 March 1998

Patrick J. Tobin & Co.,
Hynes Building,
Augustine Street,
GALWAY

Attention: John Kelly

RE: Joseph Keating to O'Malley Construction Co. Ltd
Lands At Terryland

Dear Sirs,

We would be obliged if you could forward the original OS Sheets showing the rights of way granted by Kenny Investments Ltd. and Foxfield Inns Ltd. : we belive the relevant drawing numbers are 702272/3d and 702/149/20C.

Yours faithfully,

LEWIS C. DOYLE & COMPANY.

PATK. J. TOBIN & CO.
- 1 APR 1998
RECEIVED
CONSULTING ENGINEERS

3.2

BH/SG 702272

8th April, 1999

Lewis C. Doyle & Co.,
Solicitors,
Augustine Court,
St. Augustine Street,
Galway
Attention: Lewis C. Doyle

Re: Wayleave and Right of Way

Dear Sir,

We enclose herewith original maps in respect of wayleave and rights of way as requested.

Yours faithfully,

_____
Brendan Heaney

HAMBRA CONSTRUCTION LTD.

Civil Engineering Contractors

6 ELDERWOOD, COLLEGE ROAD, CORK

Phone (021) 271853 VAT. No. 4762526D

4.1

Frank Burke,
O'Malley Construction Ltd.,
Augustine House,
Augustine Street,
Galway.

6 June 1998

Pipe jack under road near Dunnes

Dear Sir,

Having visited the site with Gerry Murphy on Thursday last I am enclosing a tender to carry out a 1050 mm pipe jack crossing underneath the main road.

If the price is acceptable to you, we should be in a position to start on the week commencing 6 July 1998.

We look forward to hearing from you shortly.

Yours sincerely.

Brian Hurley

TELEFAX TO Brendan Heaney
COMPANY: P.J. Tobin & Co
FAX NO: 565393 PAGE: 1 OF: 2
FROM: Frank Burke DATE: 2/6/98
COMPANY: O'Malley Const Co Ltd
Ref No: 7688
Post-it ™ Notes from 3M

HAMBRA CONSTRUCTION LTD.

Civil Engineering Contractors

4.2

6 ELDERWOOD, COLLEGE ROAD, CORK

Phone (021) 271853 VAT. No. 4762526D

Frank Burke,
O'Malley Construction Ltd.,
Augustin House,
Augustin Street,
Galway.

Date 6-Jun-98

Job Referance
Road Crossing,near Dunnes

Description	Quantity	Unit	Rate	Total	
Mobilisation				£ 3,500.00	
Drive Shaft				£ 4,650.00	
Supply 1050 mm Pipe	30.00	L.M.	£ 180.00	£ 5,400.00	
Install 1050 mm Pipe	30.00	L.M.	£ 550.00	£ 16,500.00	
Reception Shaft				£ 2,350.00	

SUB TOTAL	£ 32,400.00
VAT@12.5	£ 4,050.00
TOTAL	£ 36,450.00

Patrick J. Tobin & Co. Ltd.

CONSULTING, CIVIL AND STRUCTURAL ENGINEERS

HYNES BUILDING, ST. AUGUSTINE STREET, GALWAY, IRELAND. TELEPHONE (091) 565211 (091) 567104/6 FAX (091) 565398

EIMEAR COURT, MARKET SQUARE, DUNDALK, TELEPHONE (042) 35107 FAX (042) 31715
MARKET SQUARE, CASTLEBAR. TELEPHONE (094) 21401 FAX (094) 21534

4.3

Payment Certificate

Contract Number **702272** Instalment Number **(Four) 4**

To **M. Moloney, Assistant Town Clerk,**

Galway Corporation, City Hall, College Road, Galway

We hereby certify **that the sum of**

Ten Thousand Two Hundred and Thirteen

Irish Pounds **07** Pence

is due to **Pat Folan & Sons**

of **Doughiska, Merlin Park, Galway**

On account of **Headford Road Entrance** Scheme

Which sum includes Value Added Tax at a Rate of **12.50** % calculated on

IR£ **9,078.28** i.e. IR£ **1,134.79**

Date of Certificate **25th June, 1999** Signed

Managing Director/~~Director~~

Contract Sum	IR£	192,309.67
Sanctioned Extras	IR£	Nil
Already Certified	IR£	218,304.48
Now Certified	IR£	10,213.07
Certified To Date	IR£	228,517.55

Amount Retained	IR£	Nil (Ex V.A.T.)
Contract Completion Date		28th Nov. 1998
Actual Completion Date		---
Maintenance Retention	IR£	---
Final Payment Due		---

This Portion to be retained by the Consulting Engineer

Note: This certificate is not an Invoice for V.A.T. Purposes

~~Draft~~

MAP A

WAYLEAVE MAP

Wayleave from Flannery to Kenny and Keating for Storm, Foul Sewers and Services shaded yellow. Area 0.68 Ac.

Wayleave from Kenny to Flannery and Keating for Storm, Foul Sewers and Services shaded green. Area 0.84 Ac.

Scale 1:1000 Ext. O.S.S. 3345-23

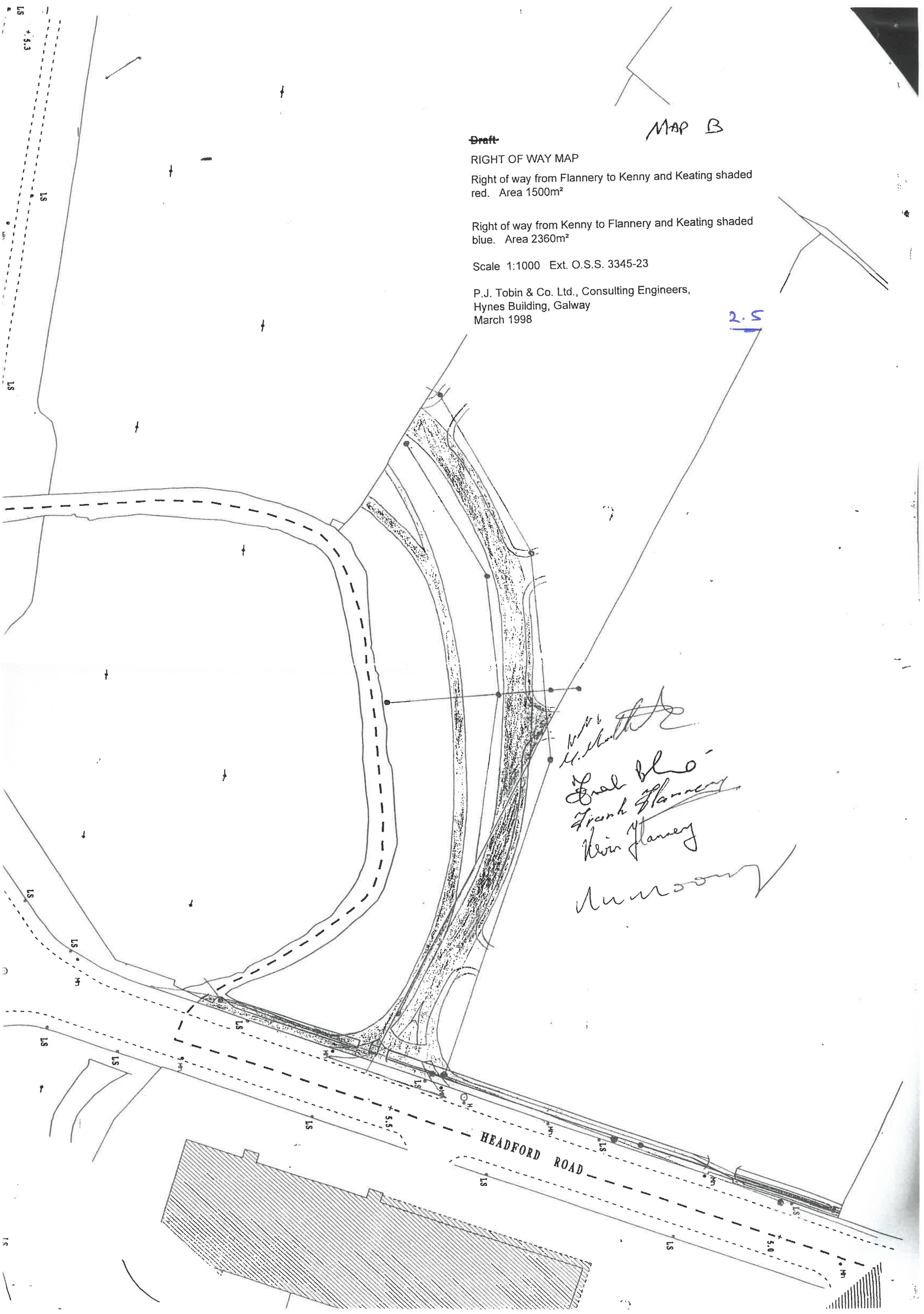
P.J. Tobin & Co. Ltd., Consulting Engineers,
Hynes Building, Galway

March 1998

2.4

HEADFORD ROAD

ROAD


MAP B
~~Draft~~
RIGHT OF WAY MAP
Right of way from Flannery to Kenny and Keating shaded red. Area 1500m²
Right of way from Kenny to Flannery and Keating shaded blue. Area 2360m²
Scale 1:1000 Ext. O.S.S. 3345-23
P.J. Tobin & Co. Ltd., Consulting Engineers,
Hynes Building, Galway
March 1998
2.5
HEADFORD ROAD
5.5
5.0
LS

WAYLEAVE MAP
Wayleave from Flannery to Kenny and Keating for Storm, Foul Sewers and Services shaded yellow.
Area 0.68 Ac.

Wayleave from Kenny to Flannery and Keating for Storm, Foul Sewers and Services shaded green. Area 0.84 Ac.

Scale 1:1000 Ext. O.S.S. 3345-23

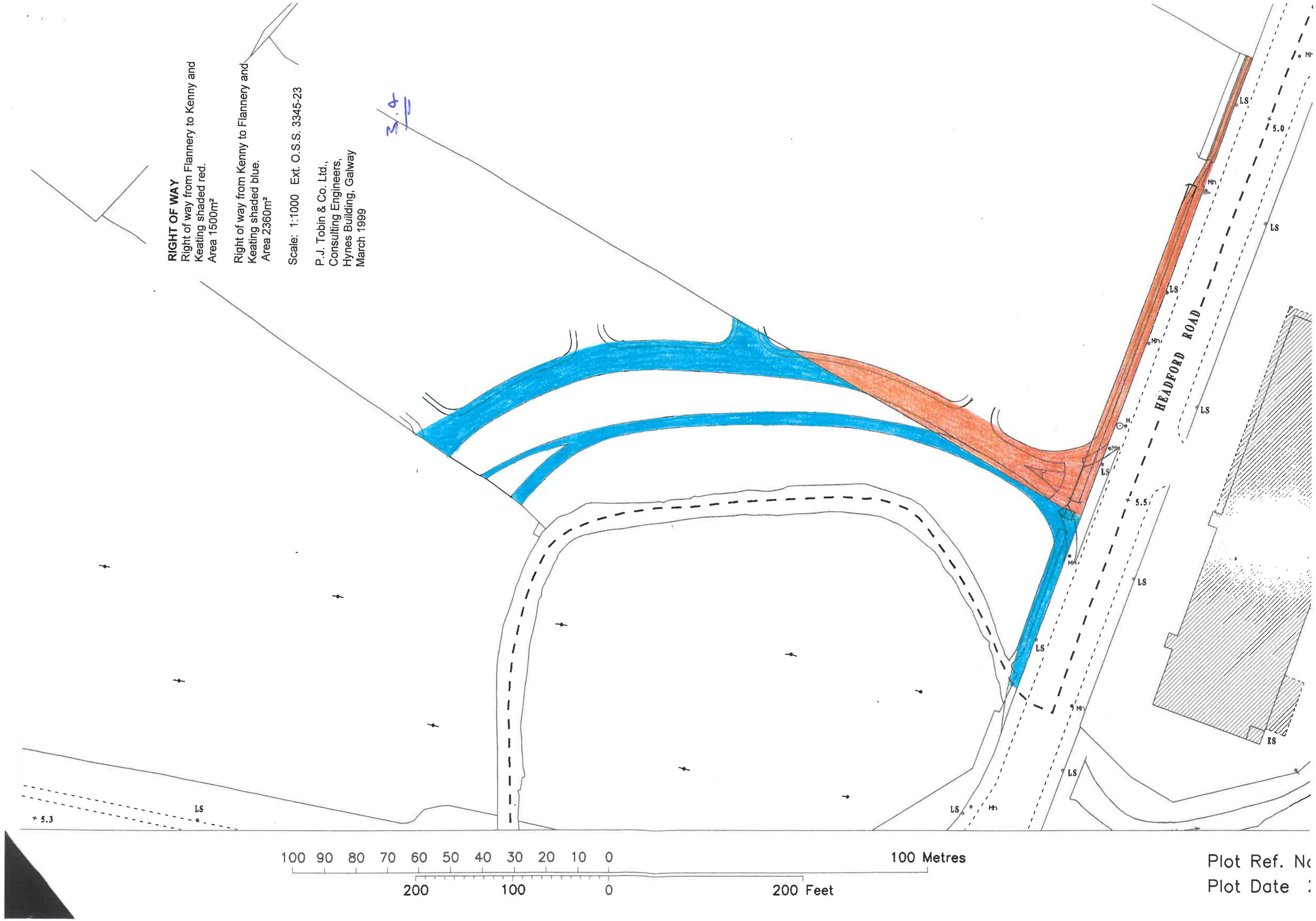
P.J. Tobin & Co. Ltd.,
Consulting Engineers, Hynes Building,
Galway
March 1999

HEADFORD ROAD

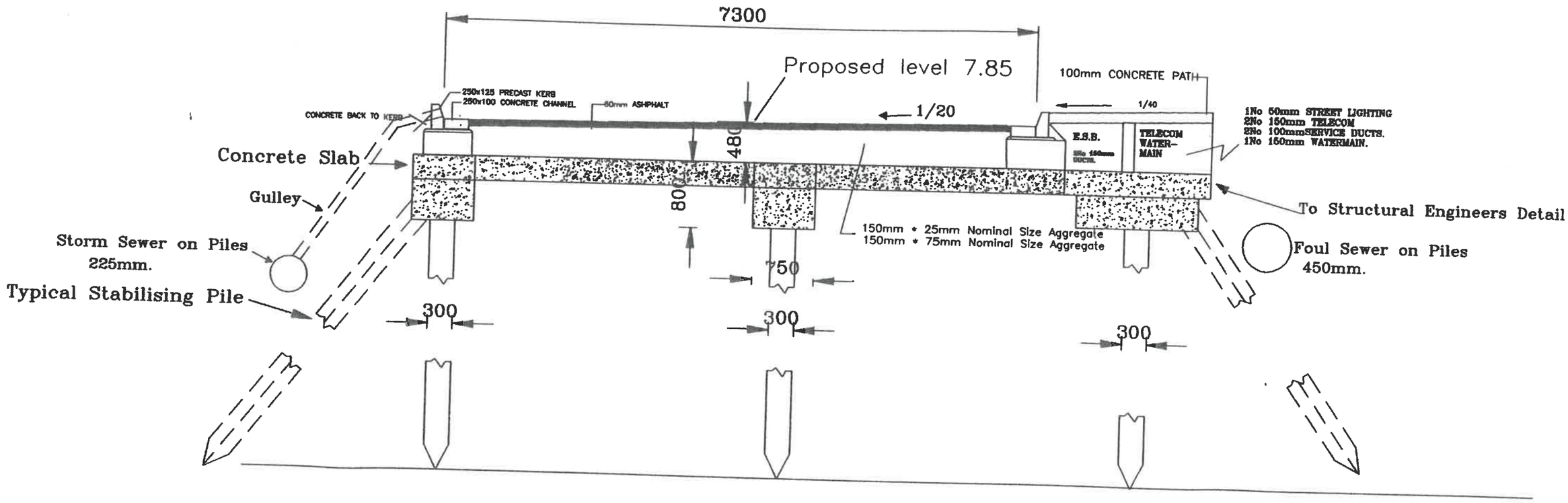
100 90 80 70 60 50 40 30 20 10 0 100 Metres

200 100 0 200 Feet

Plot Ref. No
Plot Date 2


RIGHT OF WAY
Right of way from Flannery to Kenny and Keating shaded red.
Area 1500m²
Right of way from Kenny to Flannery and Keating shaded blue.
Area 2360m²
Scale: 1:1000 Ext. O.S.S. 3345-23
P.J. Tobin & Co. Ltd.,
Consulting Engineers,
Hynes Building, Galway
March 1999
3.4
HEADFORD ROAD
LS
Mh
5.0
5.5
5.3
ES
100 90 80 70 60 50 40 30 20 10 0
100 Metres
200 100 0 200 Feet
Plot Ref. No
Plot Date

4.4



CROSS SECTION D – D AND PILE ARRANGEMENT SCALE 1:50 SEE PLAN DWG NO 126006\36.

Appendix C Irish Water Confirmation of Feasibility Letter

Exexter Porperty Ireland 3 ltd, c/o
Emma McKendrick
Unit 3
Riverfront
Howley's Quay
Co Limerick

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

10th January 2019

Dear Sir/Madam,

Re: Customer Reference No 0961049265 pre-connection enquiry - Subject to contract | Contract denied
Connection for an additional 275 bed spaces to an existing student accomodation development

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at CUIRT NA COIRIBE GALWAY. Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

Wastewater Connection:
Cuirt Na Coiribe is currently served by a private sewer network and pumping station which then ultimately connects to the Irish Water public network. The private pumping station also serves Gort na Coiribe. You will require permission to connect to the private wastewater infrastructure from its owners. You will also assess and confirm that the private infrastructure has capacity and is operationally and structurally adequate to cater for the proposed development demands. You will require to ensure that the proposed loading to the existing private pumping station and rising main does not cause any septicity issues to the Irish Water network. The operation of the existing pumping station should not cause any septicity issues to the IW network. Evidence in relation to the above will require to be provided prior to connection application stage. The feasibility feedback assessment undertaken as part of this pre connection enquiry relates only to the capacity of the existing Irish Water network to cater for the proposed development loadings.

Watermain Connection:
Cuirt na Coiribe is currently served by its own private watermain network which ultimately connects to the Irish Water 200mm diameter watermain which runs along the main Cuirt na Coiribe/Gort na Coiribe spine access road. You will also assess and confirm that the private infrastructure serving Cuirt na Coiribe has capacity and is operationally and structurally adequate to cater for the proposed development demands. Evidence in relation to the above will require to be provided prior to connection application stage. The feasibility feedback assessment undertaken as part of this pre connection enquiry relates only to the capacity of the existing Irish Water network to cater for the proposed development demands. The confirmation of feasibility to connect to the Irish Water infrastructure does not extend to your fire flow requirements. To guarantee a flow to meet the Fire Authority requirements you should provide adequate fire storage capacity within your development.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. Irish Water notes that the scale of this development may dictate that it is subject to the Strategic Housing Development planning process. Therefore in advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed the development water services design with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services. Design submissions for SHD developments can be made to cdsdesignqa@water.ie.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at **www.water.ie/connections**. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

If you have any further questions, please contact James O Malley from the design team at jomalley@water.ie. For further information, visit **www.water.ie/connections**

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

Stiúrthóirí / Directors: Mike Quinn (Chairman), Jerry Grant, Cathal Marley, Brendan Murphy, Michael G. O'Sullivan
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

Appendix D Irish Water Statement of Compliance

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Exeter property Ireland Ltd,
C/o Emma McKendrick
Unit 3 Riverfront
Howley's Quay
Co Limerick

11 March 2020

Re: Design Submission for Cuirt Na Coiribe, Galway (the "Development") (the "Design Submission") / 0961049265.

Dear Emma McKendrick,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU) (https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water Representative

Name: James O'Malley
Phone: 094 90 43310
Email: jomalley@water.ie

Yours sincerely,

M Dwyer

Maria O'Dwyer

Connections and Developer Services

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

IW-HP-MD

REV012

Appendix A

Document Title & Revision

- [PROPOSED WASTEWATER DRAINAGE - LONG SECTIONS SHEET 1 OF 3] PR354607-ACM-00-XX-DR-CE-10-0502-2
- [PROPOSED WASTEWATER DRAINAGE - LONG SECTIONS SHEET 2 OF 3] PR354607-ACM-00-XX-DR-CE-10-0503-2
- [PROPOSED WASTEWATER DRAINAGE - LONG SECTIONS SHEET 3 OF 3] PR354607-ACM-00-XX-DR-CE-10-0504-2
- [PROPOSED DRAINAGE LAYOUT] PR354607-ACM-00-XX-DR-CE-10-0501-5
- [PROPOSED WATERMAIN LAYOUT] PR354607-ACM-00-XX-DR-CE-10-2701-5

Standard Details/Code of Practice Exemption:

1. *Reduced on-site separation distances from buildings have been agreed with Irish Water.*

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

Appendix E Wastewater Drainage Network

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.000
Flow Per Person (l/per/day)	150.00	Maximum Backdrop Height (m)	0.000
Persons per House	1.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.70
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	11.688	0.130	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.001	18.252	0.091	200.0	0.000	142	0.0	1.500	o	225	Pipe/Conduit	
F2.000	4.460	0.050	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.002	23.339	0.117	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	4.575	0.046	100.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.003	12.477	0.062	200.0	0.000	140	0.0	1.500	o	225	Pipe/Conduit	
F4.000	3.706	0.041	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	5.100	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F1.001	4.970	0.000	0.0	142	0.0	33	0.41	0.81	32.2	1.5
F2.000	5.000	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F1.002	4.879	0.000	0.0	142	0.0	33	0.41	0.81	32.2	1.5
F3.000	4.760	0.000	0.0	0	0.0	0	0.00	1.15	45.6	0.0
F1.003	4.714	0.000	0.0	282	0.0	46	0.50	0.81	32.2	2.9
F4.000	4.700	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.004	21.369	0.107	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F5.000	4.250	0.047	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	18.492	0.092	200.0	0.000	140	0.0	1.500	o	225	Pipe/Conduit	
F1.006	10.946	0.055	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	11.809	0.059	200.0	0.000	30	0.0	1.500	o	225	Pipe/Conduit	
F1.008	32.056	0.160	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.000	11.553	0.128	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.001	17.181	0.115	150.0	0.000	128	0.0	1.500	o	225	Pipe/Conduit	
F7.000	3.611	0.040	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.002	20.695	0.138	150.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	3.745	0.042	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.003	13.440	0.067	200.0	0.000	128	0.0	1.500	o	225	Pipe/Conduit	
F9.000	5.754	0.064	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.004	4.652	0.000	0.0	282	0.0	46	0.50	0.81	32.2	2.9
F5.000	4.530	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F1.005	4.483	0.000	0.0	422	0.0	56	0.57	0.81	32.2	4.4
F1.006	4.390	0.000	0.0	422	0.0	56	0.57	0.81	32.2	4.4
F1.007	4.336	0.000	0.0	452	0.0	58	0.58	0.81	32.2	4.7
F1.008	4.277	0.000	0.0	452	0.0	58	0.58	0.81	32.2	4.7
F6.000	4.900	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F6.001	4.772	0.000	0.0	128	0.0	29	0.44	0.94	37.2	1.3
F7.000	4.860	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F6.002	4.657	0.000	0.0	128	0.0	29	0.44	0.94	37.2	1.3
F8.000	4.660	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F6.003	4.519	0.000	0.0	256	0.0	44	0.49	0.81	32.2	2.7
F9.000	4.500	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F6.004	20.780	0.104	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	3.697	0.041	90.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.005	14.496	0.072	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F6.006	14.322	0.072	200.0	0.000	128	0.0	1.500	o	225	Pipe/Conduit	
F6.007	21.388	0.107	200.0	0.000	119	0.0	1.500	o	225	Pipe/Conduit	
F6.008	14.812	0.074	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.009	2.934	0.015	200.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F11.000	8.352	0.024	350.0	0.000	0	0.0	1.500	o	450	Pipe/Conduit	
F11.001	43.592	0.116	375.0	0.000	0	0.0	1.500	o	450	Pipe/Conduit	
F11.002	26.731	0.071	375.0	0.000	0	0.0	1.500	o	450	Pipe/Conduit	
F11.003	19.304	0.051	375.0	0.000	0	0.0	1.500	o	450	Pipe/Conduit	
F11.004	8.870	0.024	375.0	0.000	0	0.0	1.500	o	450	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F6.004	4.436	0.000	0.0	256	0.0	44	0.49	0.81	32.2	2.7
F10.000	4.370	0.000	0.0	0	0.0	0	0.00	1.21	48.1	0.0
F6.005	4.329	0.000	0.0	256	0.0	44	0.49	0.81	32.2	2.7
F6.006	4.256	0.000	0.0	384	0.0	54	0.55	0.81	32.2	4.0
F6.007	4.185	0.000	0.0	503	0.0	61	0.60	0.81	32.2	5.2
F6.008	4.078	0.000	0.0	503	0.0	61	0.60	0.81	32.2	5.2
F1.009	4.004	0.000	0.0	955	0.0	86	0.71	0.81	32.2	9.9
F11.000	4.100	0.000	0.0	0	0.0	0	0.00	0.96	153.0	0.0
F11.001	4.076	0.000	0.0	0	0.0	0	0.00	0.93	147.8	0.0
F11.002	3.960	0.000	0.0	0	0.0	0	0.00	0.93	147.8	0.0
F11.003	3.889	0.000	0.0	0	0.0	0	0.00	0.93	147.8	0.0
F11.004	3.837	0.000	0.0	0	0.0	0	0.00	0.93	147.8	0.0

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