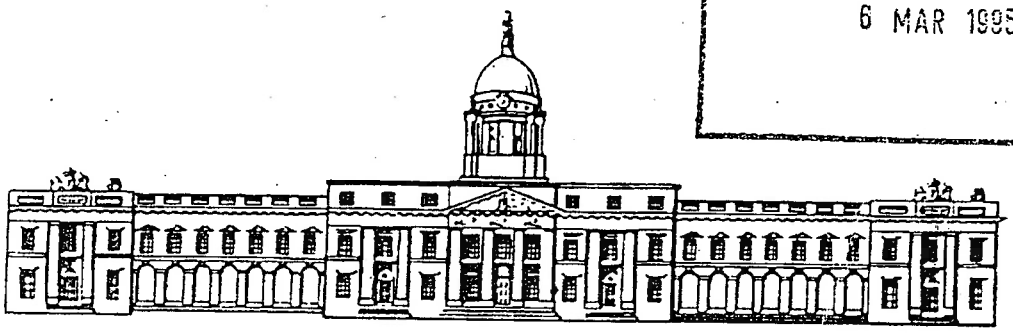
URBAN WASTE WATER TREATMENT DIRECTIVE (91/271/EEC)

Procedures and Criteria in relation to Storm Water Overflows



DEPARTMENT OF THE

ENVIRONMENT

Contents

Storm Water Overflows

1. Introduction

The Urban Waste Water Treatment Directive 91/271/EEC(UWWTD) which came into effect on 30 June, 1993 provides a framework for action to deal with the pollution threat from urban and industrial waste water. In relation to urban waste water, specific requirements apply to the provision of collecting systems and treatment plants and Member States must also decide on measures to limit the pollution from storm water overflows. This paper is intended to assist local authorities and their consulting engineers in the evaluation of requirements for implementation of the latter aspect of the UWWTD. In particular, the paper indicates the general approach and the design criteria to be followed and discusses the way these criteria might be implemented.

The overall approach is to ensure that the efficiency of the collecting system is considered in addition to the efficiency of the ultimate treatment process. In this way, the overall performance of the sewerage system is defined rather than that of the treatment plant only.

The European Commission has commissioned a consultant to carry out a review study of stormwater pollution control systems used in EU Member States. The purpose of the study is to do a comparative analysis of current practices in terms of environmental benefit and economic consequences, to develop general and technical guidelines and recommendations for good practice which can be adopted by waste water operators, and to propose suitable variants to the general guidelines to meet local needs where appropriate. The criteria and guidelines set out in this paper will be reviewed in due course in the light of any recommendations of the study report which is due to be completed shortly.

2. Directive's Requirements

Article 3 of the Directive requires Member States to "ensure that all agglomerations are provided with collecting systems for urban waste water,

- at the latest by 31 December, 1998 for those with a population equivalent of more than 10,000 discharging into a sensitive area

- at the latest by 31 December, 2000 for those with a population equivalent (p.e.) of more than 15,000, and

- at the latest by 31 December, 2005 for those with a population equivalent of between 2,000 and 15,000.

It further requires that collecting systems satisfy the requirements of Annex 1(A) of the Directive which stipulates that

"The design, construction and maintenance of collecting systems shall be undertaken in accordance with the best technical knowledge not entailing excessive costs, notably regarding:

- volume and characteristics of urban waste water,

- prevention of leaks,

- the limitation of pollution of receiving waters due to storm water overflows."

In a footnote to the above requirements, the Directive recognises that it is not possible in practice to construct collecting systems and treatment plants in a way such that all waste water can be treated during situations such as unusually heavy rainfall. As a result, it requires Member States to decide on measures to limit pollution from storm water overflows and suggests that such measures:-

(1) could be based on

- dilution rates, or
- capacity in relation to dry weather flow, or

(2) could specify a certain acceptable number of overflows per year.

3. Quality Standards

3.1 General

Apart from the specific requirements of the UWWTD, certain quality standards or objectives for the aquatic environment must be considered in relation to the provision of upgraded or new storm water overflows. These comprise standards in the following European Union Directives:-

- Council Directive of 8 December 1975 concerning the quality of bathing water (76/160/EEC)

- Council Directive of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC)

- Council Directive of 30 October 1979 on the quality required of shellfish waters (79/923/EEC)

- Council Directive of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in Member States (75/440/EEC)

These standards have been given legal effect in Ireland in each case by means of the following national Regulations:-

- S.I. No. 155 of 1992 Quality of Bathing Water Regulations, 1992 and S.I. No. 145 of 1994 Quality of Bathing Waters (Amendment) Regulations, 1994;

- S.I. No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations, 1988;

- S.I. No. 200 of 1994 Quality of Shellfish Water Regulations, 1994;

- S.I. No. 294 of 1989 European Communities (Quality of surface water intended for the abstraction of drinking waters) Regulations, 1989.

These Regulations generally require compliance with the imperative (I) standards prescribed but, in the case of bathing waters, it should be noted that the guide values therein must be the aim, since it is adherence to the guide values (and not the mandatory I values) which enables areas to qualify for Blue Flag status.

Apart from the need to ensure that the standards set in Regulations are complied with, sanitary authorities must also consider standards (or objectives) set down in Water Quality Management Plans as well as the standards/objectives recommended by the Technical Committee on Effluent and Water Quality Standards in its "Memorandum No 1 : Water Quality Guidelines (1979 Report). Information Note: In regard to the latter Memorandum, the Department is at present considering the making of regulations under Section 26 of the Water Pollution Act 1977 setting quality standards in regard to waters generally for a range of List II Dangerous Substances pertinent to the Irish situation.

3.2 Bathing Waters

As regards the protection of bathing waters, restricted spill frequency and volume of storm water discharged is required during the bathing season from mid-May to August.

The use of Time Series Rainfall for storm events confined to these months allows the determination of frequency and volume of spill using the calibrated hydraulic model of the network. Iterative use of the model with a variety of storage volumes will determine the solution to satisfy the limits adopted.

The National Rivers Authority (NRA) in the UK has set out standards for consenting storm water overflows into or in close proximity to bathing areas and water contact/recreational use waters and these standards
can be summarised as follows:

- The maximum number of independent storm events discharged via the SWO must not, on average, exceed 3 per bathing season for identified bathing waters unless it can be shown that the design will achieve the water quality standards of the Bathing Water Directive for at least 98.2% of the time.

- The maximum number of independent storm events discharging via storm water overflows affecting water contact/recreational use waters must not, on average, exceed 7 times per bathing season.

- The soffit level of the overflow outfall must be located below the level of the low water mark of mean spring tides (MLWS); otherwise a spill frequency criterion of 1 spill in 5 bathing seasons will apply.

- Normally the incoming flow must exceed that calculated from "Formula A[1]" before the storm water overflow spills unless there are high dilutions available.

- Discharge flows are required to be screened to at least 10mm and where the frequency of spill is greater than once per year, 80% of the volume should be screened to at least 6mm.

Network models using the WALLRUS software package can be used to establish the storage volume requirements to meet the criteria for potential SWO spills to the identified bathing waters.

The type of screen used to achieve the requirements should be of the screenings retention type and not of the removal type. That is, the screenings intercepted by the screen should be retained in the sewer system and not removed for separate disposal. This will reduce running and maintenance costs of screening at storm water overflows.

3.3 Sensitive Areas

The requirements for effluent treatment prior to discharge to sensitive areas is for a minimum percentage reduction of 80% of total phosphorus and 70-80% of total nitrogen. It would appear reasonable that a volume reduction in storm sewage spill of this magnitude would be a consistent standard in this area. That is, the volume overflows as a percentage of rainfall run-off volume to the foul sewer would be a maximum of 20%.

This will require that a combination of storage and other sewerage improvements be considered to contain 80% of storm water run-off using Time Series Rainfall analysis in the Wallrus models for the contributing catchments. This level of containment(80%) would be a minimum value and should correspond to a proportionately higher percentage containment of nutrients since part of the nutrient load is carried in suspended solids, retention of which would be maximised in the design of the overflow structures.

4. Assessment Criteria for Existing SWO's

In assessing the operation of an existing SWO, one must determine if it:

(1) causes significant visual or aesthetic impact and public complaints,

(2) causes deterioration in water quality in the receiving water,

(3) gives rise to failure in meeting the requirements of national Regulations on foot of EU Directives(Bathing Waters, etc.)

(4) operates in dry weather.

5. Options following Assessment

Following assessment of an SWO on the basis of the criteria set out above, there are a number of options which can be considered in the context of remedying any capacity constraints. The first and most widely used option is an upgrading of the existing system. As the design considerations associated with upgrading also apply to new SWO's, these are dealt with together in section 6 below. Other options are "use of storage" and "active control". The use of storm water storage tanks is increasingly recommended as an alternative to the up-sizing of downstream capacity and this is dealt with in section 7 below. Active control, which involves effective use of spare storage capacity of sewer networks, is a relatively new approach and is dealt with in section 8 below.

6. Upgrading SWO's/New SWO's

6.1 Design Criteria

The general criterion for the future design of storm water overflows is defined as an absence of visible signs of sewage-derived debris (e.g. oil slicks, foaming etc.) and of deposits or algal growths caused by sewage discharge. This requires that the effects of organic/nutrient loads deposited in bed sediments must also be considered.

Design criteria for storm water overflows must take into consideration the following:

- beneficial uses of receiving waters and corresponding standards and water quality objectives,

- the nature and strength of sewage including the effects of re-suspension and "first foul flush" effects which may increase rather than diminish sewage strength in the sewer with increasing flow, and policy in relation to industrial discharges to the sewer,

- the siting of overflow discharges and their potential for aesthetic nuisance, and

- the type of overflow and its efficiency in containing as far as possible floating debris and solids generally, i.e. maximum solids separation.

6.2 Design Principles

The main difficulty in relation to setting standards for storm water overflows is the lack of information available on the effects of transient shock loadings on the receiving water and the difficulty of predicting their effects. Random physico-chemical sampling may not identify pollution associated with overflows. Biological sampling and assessment of receiving waters and bed sediments provides a more accurate assessment of on-going environmental conditions. Such sampling will be expected to indicate the biological impact of transient pollution.

The minimum setting for storm water overflows has traditionally been six times dry weather flow (6 DWF). In the UK this approach was replaced by "Formula A" following the report of the Technical

Committee on Storm Overflows and the Disposal of Storm Sewage (HMSO 1970)[1].

This is defined as follows:

$$\text{Formula A} = DWF + 1.36P + 2E \text{ m3/ day}$$

where 'P' is the population served and 'E' is the industrial effluent flow.

This provides broadly for 6 DWF from the domestic contribution but uses only a factor of 2 on the industrial effluent flow. This appears very low particularly where industrial effluent comprises a significant proportion of the total flow and constitutes high strength wastes with potentially toxic impacts. This was recognised in the report with a recommendation to increase the term '2E' in such situations.

Formula A should be considered as the minimum overflow setting in all situations whilst, at the same time, recognising its limitations in that

- no account is taken of the impermeable area draining to the overflow,
- no account is taken of the flow regime or use of the receiving water,
- there is no set method for making allowances for industrial discharges,
- no account is taken of the impact of intermittent pollution on the quality of the receiving water.

In addition, the following steps should also be applied:

(i) subjective criteria should be applied to exclude spills to minor watercourses and small, relatively clean, streams and such receiving waters should be deemed unsuitable for such discharges,

(ii) storm overflow structures should be designed in accordance with the WRc publication ER304E[2] with acceptable types of overflow structure limited to high side weir, stilling basin and vortex chamber overflows designed to achieve efficient solids separation and retention,

(iii) outlet control should maximise the retained flow at a near constant rate within the system capacity,

(iv) such an overflow should be designed for effective containment of detritus and floating debris,

(v) overflow structures should be capable of being properly maintained with provision for adequate ventilation, safe access and lighting,

(vi) overflow discharge points should be discreetly located and for, coastal outfalls, should be taken, where practical, to low water level,

(vii) traditional structures of the low side weir type and ad-hoc overflows of the hole-in-the-wall type should in time be replaced by properly designed overflows, rationalised where possible to a minimum number of overflow structures for each system.

The preliminary assessment of each overflow should also have regard to possible "first foul flush" effects. These will depend on the nature of the sewage and the nature of the sewers upstream and their gradients. Such flows have the potential for severe pollution due to extremely high BOD_5 levels, potentially toxic levels of ammonia and hydrogen sulphide, and long term degradation associated with a high level of organic solids deposited on the bed of the receiving water which continue to depress dissolved oxygen levels and release nutrients.

In general, research has shown that sewage strength frequently increases significantly during this "first foul flush" period, which tends to approximate to the time of concentration 'T_c', following which the strength decreases and the effects of dilution become evident.

6.3 Detailed Design Requirements

A well designed and effective SWO must be capable of meeting the following general requirements:

(1) good hydraulic control,

(2) good separation of gross pollutants,

(3) reliability,

(4) minimal maintenance requirements, and

(5) reasonable cost.

Generally, SWOs designed to WRc Report ER304E will meet these requirements though the hydraulic control (in particular for smaller SWOs) and the separation of gross solids needs careful consideration.

Hydraulic control at SWOs may be achieved by orifice plate, throttle pipe, vortex regulators or by adjustable penstocks. The WRc Report recommends that orifice throttles should have a diameter of opening of at least 200mm to reduce the risk of blockage. Likewise the diameter of a throttle pipe should not be less than 200mm and its length should ideally be between 3m and 30m long. Where penstocks are used, a clear ope capable of passing a 200 mm sphere should be provided. A vortex regulator may be used where the minimum required dimension of opening of 200mm cannot be met . These are usually of stainless steel construction and are fitted into the entrance of the continuation pipe. This device restricts the flow passing forward while allowing solid objects to pass through unrestricted. Generally each device is designed for the specific application and will require some maintenance from time to time.

Recommended chamber dimensions are given in the WRc Report for high side weir and stilling pond overflows to ensure good separation of gross polluting solids. The Report notes that, as performance is sensitive to minor changes in configuration, care should be taken not to deviate from the recommended chamber dimensions. Vortex overflows do not rely on a stilling effect to separate gross solids but require a significant drop in invert (1.5 times inlet diameter) and are therefore best suited to sewers with steeper gradients.

Hydro-dynamic separators are now available in prefabricated form which facilitates installation. These operate in a similar manner to vortex overflows with peripheral spill. Care should be taken in the selection of such devices to ensure that effective solids separation and hydraulic control is achieved.

The WRc Report recommends that screens should only be used in exceptional circumstances, for example, where the receiving water has a high amenity value. Where they are used, proper attention should be given to their location, the velocity of flow through the screens, raking and maintenance arrangements.

6.4 Planning Methodologies

Various methods are available or are currently being developed for establishing discharge settings and acceptable spill regimes. The use of a particular method is dependent on the level of significance placed on the particular overflow and the receiving water at the discharge point. This should be based on a combined assessment of the size of the contributing catchment, the available dilution, and the classification of the receiving water at the location of the overflow.

The Urban Pollution Management Steering Group(UK) have developed criteria for the initial assessment. Table 1 in Appendix 1 sets out the criteria for freshwaters and Table 2 those for coastal waters and estuaries. Recommended approaches depending on the level of significance of the overflow are set out in Appendix 2. These appendices are included for general guidance only; it will be necessary to examine each situation on its merits.

7. Use of Storage

The use of storm water storage tanks is increasingly recommended as an alternative to the up-sizing of downstream capacity for reducing or eliminating storm water overflows. These tanks can be on-line or off-line and operate on the principle that flows in excess of the downstream capacity can be contained until the storm has sufficiently abated to allow the stored storm water to be returned to the sewer. The downstream capacity of the system is therefore maximised and overflows are minimised. The tanks are generally sized to contain the overflow that would arise from a storm with a specific return period, the 'design event' . Typically, a storm of one hour duration with a return period of five years is used for a built-up area.

Calibrated hydraulic models of sewer networks are being developed which will be used in conjunction with Time Series Rainfall[3] to calculate overflow frequency and volumes. Use of sampling data of recognised parameters will allow estimates to be made of the pollution loads associated with such overflows.

Experience has shown that relatively modest storage volumes can appreciably reduce the frequency of overflows. While the reduction in the volume of overflow may not be as significant, overflows from major storm events will be relatively dilute discharges coinciding with relatively high flows in receiving waters. These conclusions are evident from consideration of the pattern of rainfall - occasional extreme events of high intensity and critical duration as compared with the majority of rainfall which tends to be of relatively low intensity.

The design of storm water storage tanks to effectively retain floatables and for ease of cleaning out and maintenance is very important. Traditionally, small storm tanks have been circular tanks designed exactly as for settling tanks. Larger storm tanks have tended to be rectangular in shape containing chain driven scraper equipment for cleaning out of settleable solids. A number of methods have now been developed including the "tipping bucket" method to wash out flood deposits at the end of tank use. This system comprises a container fabricated from stainless steel mounted on bearings on the end wall of the tank. The shape of the container is designed so that it automatically tips and empties when full thus flushing the settled deposits on the floor of the tank to the return sump. The number and capacity of tipping buckets required to effectively clean the tank is a function of the dimensions of the tank.

8. Active Control

Sewer systems, particularly large trunk sewer networks in cities and large towns, have significant storage volumes which could be more effectively utilised to reduce pollution from SWOs. Active (or real time) control of a combined sewer system will result in optimised performance from existing control structures and more cost effective upgrading of the system. Sewer system controls using telemetry to collect information and remotely operated control structures have been introduced in some major cities in Europe and the U.S. to take advantage of these benefits thus reducing the amount of capital investment required. The tools necessary to be capable of implementing active control in a sewer system are:

- spare capacity in the sewers,
- spatial variability in rainfall,
- knowledge of rainfall pattern and the response of the sewer network,
- data collection sensors,
- decision making system,
- operating hardware including telemetry control system.

Such systems will bring the operation of sewerage networks into a new era of management control which to date has been employed only on the distribution of potable water. The key to such control is data collection and an understanding of the way the sewerage network responds to rainfall events. Such an understanding will allow the operator derive maximum benefit from

the existing infrastructure and make informed decisions on cost effective improvements. From an Irish perspective, the potential for using active control would be limited to the larger urban centres where justification may be found for the costs involved.

9. Catchment Management

Future developments will undoubtedly include a more integrated approach to catchment management. This will result in river models together with sewage treatment works models and sewer network models being used to predict impacts of discharges on receiving waters for parameters such as dissolved oxygen, BOD_5, SS etc. This will lead to a better understanding of impacts on river water quality and will require that a much broader approach be adopted by engineers involved in the design and management of urban wastewater systems.

Table 1 - UPM Indicative Impact Assessment Criteria for Storm Overflows to Freshwaters
Low Significance Dilution > 8 : 1 (foul DWF @ 95% ile flow) No interaction with other discharges
Medium Significance Dilution < 8 : 1 Limited or no interaction with other discharges > 2,000 population equivalent Cyprinid fishery only if all these criteria apply.
High Significance Dilution < 2 : 1 Interaction with other discharges > 10,000 population equivalent Cyprinid or salmonid fishery only if all of these criteria apply

Table 2 UPM Indicative Impact Assessment Criteria for Storm Overflows to Coastal Waters and Estuaries
Low Significance Estuarial and coastal waters not containing EC identified bathing waters and shellfish waters
Medium Significance Population equivalent 2,000 - 10,000 Affects identified bathing waters and shellfish waters only if both criteria apply.
High Significance Population equivalent > 10,000 Affects identified bathing waters and shellfish waters only if both criteria apply.

Appendix 1

Appendix 2

A. Low Significance SWOs

For overflows of low significance minimum data techniques such as "Formula A", SDD Method[4], and QUALSOC[5] would be used. The SDD Method developed by the Scottish Development Department is an improvement on "Formula A" in that an account, albeit arbitrary, is made of the available dilution in the receiving water to recommend the size of storage tanks to be provided at an overflow. These recommendations are reproduced in Table 3 attached. It should be noted that the dilution factor used is that normally used for treatment works discharges and is therefore not a measure of the dilution of the overflow discharge but simply a measure of the relative size of the sewerage system and the river. Apart from this improvement, the limitations listed above with regard to "Formula A" apply equally to the SDD Method.

QUALSOC was the next improvement to the use of "Formula A" and was developed by the Welsh Water Authority. In principle the method is a dilution model which estimates the flow and pollutant concentration being discharged from the overflow, dilutes this with the estimated flow in the river and compares the resulting pollutant concentration with desirable limits. However, it does this by estimating discharges without having a model of the sewerage network or of the river to calculate the impact of discharges from particular events. The results therefore require careful interpretation to determine what they actually mean. The main limitations of this approach are that considerable skill is required to answer the following questions:

- what flow is likely in the river when the overflow is occurring?

- how frequently will the overflow occur?

- what effect will a "first foul flush" have?

- is there interaction with other discharges?

Table 4 attached shows the National Rivers Authority (U.K.) guidance standards for the use of QUALSOC.

Relatively little data about the sewer network or receiving water is required for any of these methods. Shortcomings include the limited consideration given to the environmental impact of the discharge and the inability to size any in-sewer flow attenuation facilities to counter restricted downstream capacity. Solutions identified by these methods may not be the most cost effective as a result.

B. Medium Significance SWOs

For overflows of medium significance the use of a hydraulic model such as WALLRUS for the sewer network and what are known as the Interim Procedure and CARP[6], (Comparative Acceptable River Pollution), would be appropriate.

The Interim Procedure estimates concentrations of various pollutants in overflow discharges and was first introduced in the second edition of the Sewerage Rehabilitation Manual[7]. It was designed to be used with a sewer hydraulic model which would predict the volume of overflow spill. The Procedure is based on a simplifying assumption that the pollutant concentration can be represented by an average concentration that was constant throughout the spill and that was the same for each rainfall event. The pollutant concentrations can be obtained in three

ways, given here in order of increasing cost:

1. Use the figures published with the Procedure which were derived from taking samples of overflow spill from about eight catchments and are reproduced in Table 5 attached.

2. Measure concentrations in the dry weather flow and use the dilution factors published with the Procedure which were derived from the same catchments and are reproduced in Table 6 attached.

3. Install sampling equipment at overflows and measure concentrations during a number of spill events to produce site specific average concentrations.

The CARP technique was developed by the WRc to give a method of comparing the impact of discharges to a receiving water. This involved looking not just at the total load of pollutant in a year, but at the pattern of discharge of pollutants throughout the year. It also developed a measure of the impact of the discharge which should be independent of the river size. There are limitations to the use of this procedure:

- The average concentrations for pollutant discharge are intentionally chosen to represent the highest likely concentration, and so will overestimate the spill.

- The average concentrations do not take into account change in concentration during an event in particular "first foul flush" effects or the beneficial effects of storage tanks in capturing the "first foul flush" and only spilling the later, cleaner flow.

- Only one standard river has been defined for this procedure which is for a Class 2, fast flowing stream. There is a doubt as to whether the standard applies to rivers of different character, for example, lowland rivers or very large rivers.

- The results can be influenced by the choice of river reach length used in the calculations.

For coastal discharges the hydraulic network model can be used directly to assess compliance with a spill frequency criterion. While there is a need for a considerably larger amount of data for these methods, their use in addition to taking the impact on the receiving waters into consideration, also allows storm water detention facilities to be sized with some confidence.

C. High Significance Overflows

For overflows of high significance, the use of complex models is justifiable. For the inland waters a sewer quality simulation model such as MOSQITO[8] and a dynamic impact model such as MIKE 11[9] would be employed, in addition to the WALLRUS model, together with a method to generate suitable Time Series Rainfall data where adequate historical records do not exist.

MOSQITO has been developed to simulate the changing quality of sewage throughout a storm event and models BOD, COD Suspended Solids and Ammonia. Standard pollutant mixture characteristics are given for use where local data are not available. Characteristics are also given for pipe sediments in combined systems and for pollutants initially in gully pots. Verification of the model is essential and is structured so that the standard values used to construct the model are replaced by measured values in stages, and only if necessary. This ensures that only essential data need be collected and a catchment which is accurately represented using the standard values can be modelled with the minimum of data collection.

MIKE 11 is a software package for simulating river water quality for selected parameters which can be used to assess the impact of storm water overflow discharges and check compliance with water quality objectives.

For marine situations, a marine advection/dispersion model would be required to assess the bacteriological impact relative to the criteria set down in the Bathing Water Directive.

As the costs associated with data collection, setting up, calibration and verification of these models are substantial their use should be restricted to the major urban schemes with high significance overflows. Where they are used, the benefits of having a detailed model of the existing system and the ability to test the effects of various options allows much greater confidence in the proposed solution. This should lead to more cost effective

solutions being proposed.

The level of investment that should be put into the preparation of these models should, of course, be assessed by taking into consideration, not alone the likely savings to be made in the short term by the construction of the more cost effective solutions that will be developed by their use, but also by the ongoing benefits such models will provide in assessing the performance of the augmented sewer network.

Table 3 SDD Method Recommended Storage at Overflows		
Dilution Factor	Overflow Setting	Storage Tank
> 8	Formula A	None
> 6	Formula A + 455P	None
	or Formula A	40 l / hd
> 4	Formula A	40 l / hd
> 2	Formula A	80 l / hd
> 1	Formula A	120 l / hd

Dilution factor = Average DWF / 95% ile flow.

Table 4 NRA Guidance Standards for QUALSOC Models			
River Class	BOD Limit		
	95%ile mg/l	99%ile mg/l	MAC mg/l
1B	5	9	12
2	9	16	20

Table 5 Interim Procedure Stormflow Concentrations		
Determinand	Flat Catchments	Steep Catchments
	mg/l	mg/l
BOD	125	75
COD	390	330
NH3	8	4
SS	420	340

Table 6 Interim Procedure Dilution Factors		
Determinand	Flat Catchments mg/l	Steep Catchments mg/l
BOD	0.5	0.3
COD	0.7	0.9
NH3	0.3	0.3
SS	1.5	1.5

References

1. Technical Committee on Storm Overflows and the Disposal of Storm Sewage; Final Report. Ministry of Housing and Local Government. HMSO 1970.

2. A guide to the design of storm overflow structures. Water Research Centre Report ER304E 1988.

3. Time Series Rainfall. Water Research Centre Report ER195E.

4. Storm Sewage Separation and Disposal. - Scottish Development Department HMSO 1977.

5. QUALSOC. Storm Sewage Overflow Policy Group, October 1988. Welsh Water Authority.

6. Interim Water Quality Planning Procedures for Controlling Intermittent Pollution from Storm Sewage Overflows. Water Research Centre Report ER317E 1988.

7. Sewerage Rehabilitation Manual - 2nd Edition. WRc 1986.

8. MOSQITO User Manual. HR Wallingford 1991.

9. MIKE 11 User Guide. Danish Hydraulic Institute 1990.

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29 April 2022

Re: CDS21008799 pre-connection enquiry - Subject to contract | Contract denied

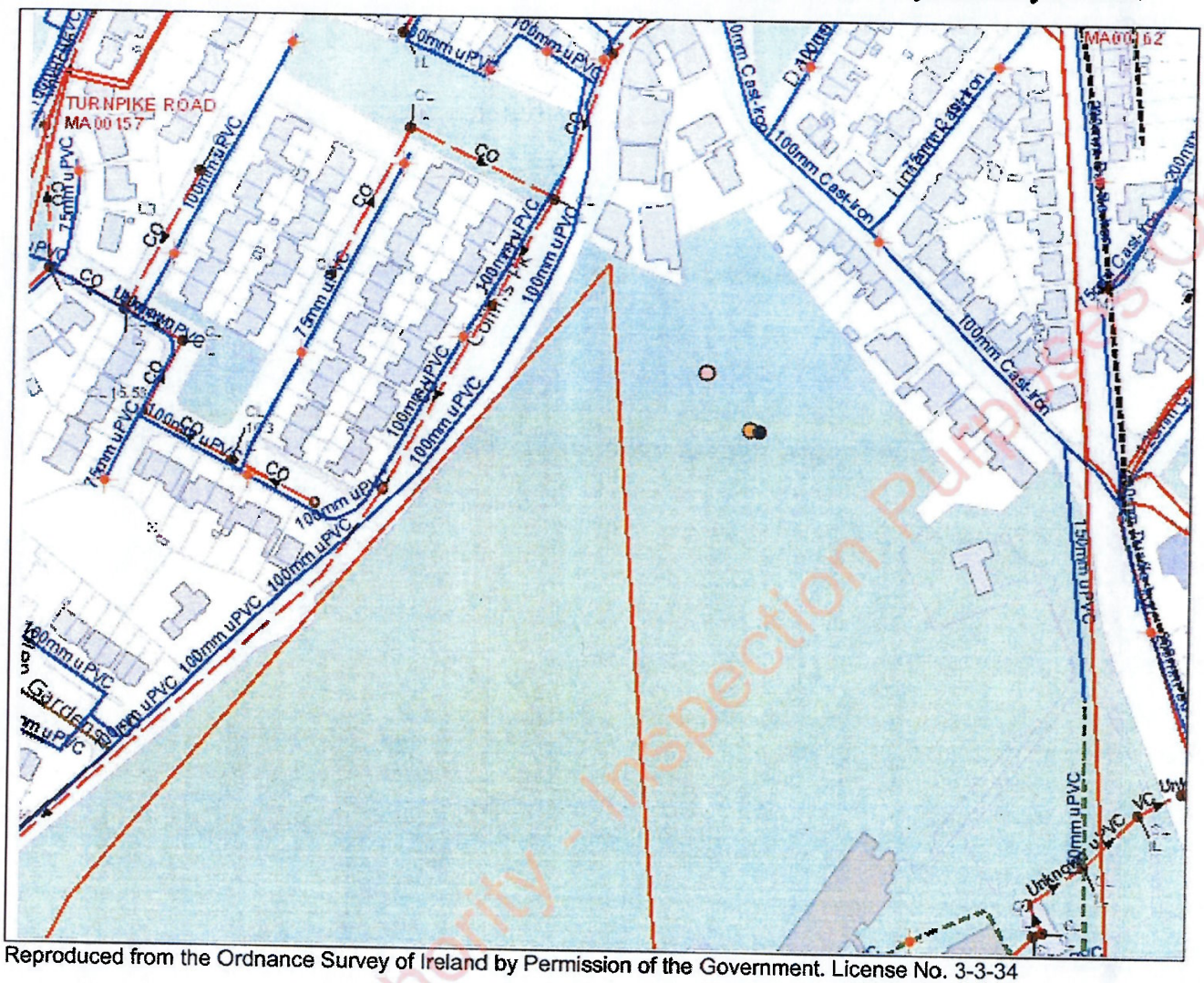
Connection for Business Connection of 1 unit(s) at Turnpike Road, Ennis, Clare

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Turnpike Road, Ennis, Clare (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	There is sufficient capacity for the proposed development.
Wastewater Connection	There is sufficient capacity for the proposed development.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Shane Mcmanus from the design team by email to shane.mcmanus@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Our Ref: AIER128

Date: 09 June 2023

Uisce Éireann
Teach Colvill
24-26 Sráid Thalbóid
Baile Átha Cliath 1
D01 NP86
Éire

Uisce Éireann
Colvill House
24-26 Talbot Street
Dublin 1
D01 NP86
Ireland

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

Michael Duffy
1 Clós na hEaglaise,
Kilfenora,
Co. Clare.

duffycivileng@gmail.com

Dear Mr. Duffy,

I refer to your request dated 25 May 2023 and received by Uisce Éireann on 25 May 2023 under EU Directive 2003/4/EC (the **"Directive"**) (as transposed by the European Communities (Access to Information on the Environment) Regulations 2007–2018 (the **"Regulations"**) for the following information:

- *"All details regarding an assessment of pre-connection enquiry CDS21008799 and especially around the desktop analysis of the capacity currently available in the Irish Water networks as referred to in correspondence issued on 29 April 2022 (copy attached)."*

Following consideration of the provisions of the AIE Regulations, Uisce Éireann has reached a decision to grant your request on 09 June 2023. If you have any queries regarding this correspondence or would like to discuss your request further please contact foi@water.ie

I attach the relevant records returned by the decision-maker processing your AIE request. The decision-maker has advised that the Pre-Connection Enquiry (PCE) process involves three steps:

1. Customer submits completed PCE form to Uisce Eireann (Uisce Éireann).
2. Uisce Éireann/Local Authority Water Services assess the proposal and capacity in the Uisce Éireann assets;
3. Confirmation of Feasibility (COF) letter is issued to the Customer.

The information attached contains details of the assessments (Desk Top Analysis of Capacity) extracted from our Microsoft Dynamics 365 (D365) system that different stakeholders feed into.

Under Article 11 of the Regulations, you have a right to seek an internal review of our decision. An internal review must be requested within one month of receipt of our decision. There is no charge for requesting an internal review. If you would like to seek an internal review, you can do so by sending an email to foi@water.ie

Yours sincerely,

Noel Shannon
AIE Officer

Uisce Éireann

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

This form is to be filled out by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure. If completing this form by hand, please use BLOCK CAPITALS and black ink.

Please refer to the **Guide to completing the pre-connection enquiry form** on page 13 of this document when completing the form.

*** Denotes mandatory/ required field. Please note, if mandatory fields are not completed the application will be returned.**

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable): HSE Midwest

Trading name (if applicable): N/A

Company registration number (if applicable): N/A

If you are not a registered company/business, please provide the applicant's name:

N/a

*Contact name: [redacted]

*Postal address: See Note 1

*Eircode: [redacted]

*Telephone: [redacted]

Mobile:

*Email: [redacted]

2 Agent details (if applicable):

Contact name: Alan Armstrong

Company name (if applicable): D. Fallon Consult. Eng

Postal address: Office 25, Calbro Court, Tuam Road, Galway

Eircode: H91YKH4

Telephone: [redacted]

Email: [redacted]

3 ***Please indicate whether it is the applicant or agent who should receive future correspondence in relation to the enquiry:**

Applicant [ ] Agent [x]

Section B | Site details

4 ***Site address:** Turnpike Rd, Ennis,
Co Clare

5 ***Irish Grid co-ordinates of site:** Eastings (X) 133674 Northings (Y) 176536

Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 ***Local Authority:**

Local Authority that granted planning permission (if applicable):

Clare County Council

7 ***Has full planning permission been granted?** Yes [ ] No [x]

If 'Yes', please provide the current or previous planning reference number:

Section C | Development details

8 Please outline the domestic and/or industry/business use proposed:

Property type	Number of units	Property type	Number of units	Property type	Number of units
House		Apartments		Agricultural	
Office		School		Retail unit	
Residential care home		Institution		Industrial unit	
Hotel		Factory		Other	1
Other (please specify type)	100 Bed Community Nursing Unit				

9 *Approximate start date of proposed development: 01 / 04 / 2023

10 *Is the development multi-phased? Yes ☐ No ☒

If 'Yes', application must include a master-plan identifying the development phases and the current phase number.

If 'Yes', please provide details of variations in water demand volumes and wastewater discharge loads due to phasing requirements.

11 *Please indicate the type of connection required by ticking the appropriate box below:

Water ☐ Please go to Section D

Wastewater ☐ Please go to Section E

Both ☒ Please complete both Sections D and E

Section D | Water connection and demand details

12 ***Is there an existing connection to public water mains at the site?** Yes ☐ No ☒

12.1 If yes, is this enquiry for an additional connection to one already installed? Yes ☐ No ☒

12.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☒

13 **Approximate date water connection is required:** 01 / 04 / 2023

14 ***What diameter of water connection is required to service the development?** 150 mm

15 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ☒

If 'Yes', how many? ☐☐

16 **Please indicate the business water demand (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak hour water demand	0.725 (See Calculation 2)	**l/s**
Post-development average hour water demand	0.58 (See Calculation 1)	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

17 **Please indicate the industrial water demand (industry-specific water requirements):**

Post-development peak hour water demand	N/A	**l/s**
Post-development average hour water demand	N/A	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

18 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?**

15.62 m

19 **What is the highest finished floor level of the proposed development above Malin Head Ordnance Datum?**

14.78 m

20 **Is on-site water storage being provided?** Yes ☐ No ☒

Please include calculations on the attached sheet provided.

21 **Are there fire flow requirements?** Yes ☐ No ☒

Additional fire flow requirements over and above those identified in Q16-17	N/A	**l/s**

Please include calculations on the attached sheet provided, and include confirmation of requirements from the Fire Authority.

22 **Do you propose to supplement your potable water supply from other sources?** Yes ☐ No ☒

If 'Yes', please indicate how you propose to supplement your potable water supply from other sources (see **Guide to completing the application form** on page 12 of this document for further details):

Section E | Wastewater connection and discharge details

23 ***Is there an existing connection to a public sewer at the site?** Yes ☐ No ☒

23.1 If yes, is this enquiry for an additional connection to the one already installed? Yes ☐ No ☒

23.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☒

24 ***Approximate date that wastewater connection is required:** 01 / 04 / 2023

25 ***What diameter of wastewater connection is required to service the development?** 225 mm

26 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ☒

If 'Yes', how many?

27 **Please indicate the commercial wastewater hydraulic load (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak discharge	4.297 See Calculation 4	**l/s**
Post-development average discharge	3.438 See Calculation 3	**l/s**

Please include calculations on the attached sheet provided.

28 **Please indicate the industrial wastewater hydraulic load (industry-specific discharge requirements):**

Post-development peak discharge	N/A	**l/s**
Post-development average discharge	N/A	**l/s**

Please include calculations on the attached sheet provided.

29 **Wastewater organic load:**

Characteristic	Max concentration (mg/l)	Average concentration (mg/l)	Maximum daily load (kg/day)
Biochemical oxygen demand (BOD)	258.85 mg/l. See Appendix B	207.08 mg/l. See Appendix B	15.531 kg/day. See Appendix B
Chemical oxygen demand (COD)			
Suspended solids (SS)			
Total nitrogen (N)			
Total phosphorus (P)			
Other			

Temperature range	
pH range	

30 ***Storm water run-off will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer. In the case of such brownfield sites, please indicate if the development intends discharging surface water to the combined wastewater collection system:**

Yes ☐ No ☒

If 'Yes', please give reason for discharge and comment on adequacy of SUDS/attenuation measures proposed.

31 ***Do you propose to pump the wastewater?** Yes ☐ No ☒

If 'Yes', please include justification for your pumped solution with this application.

32 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?**

8.50 m

33 **What is the lowest finished floor level on site above Malin Head Ordnance Datum?** 11.00 m

34 **What is the proposed invert level of the pipe exiting the property to the public road?**

7.225 m

Section F | Supporting documentation

Please provide the following additional information (all mandatory):

> Site location map: A site location map to a scale of 1:1000, which clearly identifies the land or structure to which the enquiry relates. The map shall include the following details: [x]

i. The scale shall be clearly indicated on the map.

ii. The boundaries shall be delineated in red.

iii. The site co-ordinates shall be marked on the site location map.

> Details of planning and development exemptions (if applicable). [ ]

> Calculations (calculation sheets provided below). [x]

> Site layout map to a scale of 1:500 showing layout of proposed development, water network and wastewater network layouts, additional water/wastewater infrastructure if proposed, connection points to Irish Water infrastructure. [x]

> Conceptual design of the connection asset from the proposed development to the existing Irish Water infrastructure, including service conflicts, gradients, pipe sizes and invert levels. [ ]

> Any other information that might help Irish Water assess this pre-connection enquiry. [x]

Section G | Declaration

I/We hereby make this application to Irish Water for a water and/or wastewater connection as detailed on this form.

I/We understand that any alterations made to this application must be declared to Irish Water.

The details that I/we have given with this application are accurate.

I/We have enclosed all the necessary supporting documentation.

Any personal data you provide will be stored and processed by Irish Water and may be transferred to third parties for the purposes of the water and/or wastewater connection process. I hereby give consent to Irish Water to store and process my personal data and to transfer my personal data to third parties, if required, for the purposes of the connection process.

If you wish to revoke consent at any time or wish to see Irish Water's full Data Protection Notice, please see **https://www.water.ie/privacy-notice/**

Signature: [redacted]

Date: 13 / 12 / 2021

Your full name (in BLOCK CAPITALS):

Alan Armstrong

Irish Water will carry out a formal assessment based on the information provided on this form.
Any future connection offer made by Irish Water will be based on the information that has been provided here.

Please submit the completed form to **newconnections@water.ie** or alternatively, post to:

Irish Water
PO Box 860
South City Delivery Office
Cork City

Please note that if you are sending us your application form and any associated documentation by email, the maximum file size that we can receive in any one email is 35MB.

Please note, if mandatory fields are not completed the application will be returned.

Irish Water is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions such as where the requested records may not be released, for example to protect another individual's privacy rights or to protect commercially sensitive information. Please clearly label any document or part thereof which contains commercially sensitive information. Irish Water accepts no responsibility for any loss or damage arising as a result of its processing of freedom of information requests.

Calculations

Water demand

Please note that the site is currently a Greenfield site with no existing water demand.

Calculation 1. Proposed Average Water Demand

Staff No's = 90
Patients No's = 125
Allowance for visitors = 35
Total = 250

Allow for 60 Litres/Person/Day for Staff
Therefore, loading = 90 x 60 = 5,400 Litres/Day
We require this in l/s, therefore 5,400 l/day = 0.063 l/s

Allow for 350 Litres/Person/Day for Patients {As per IW Wastewater Code of Practice Page 172}
Therefore, loading = 125 x 350 = 43,750 Litres/Day
We require this in l/s, therefore 43,750 l/day = 0.506 l/s

Allow for 30 Litres/Person/Day for Visitors
Therefore, loading = 35 x 30 = 1050 Litres/Day
We require this in l/s, therefore 1050 l/day = 0.012 l/s

Total Demand = 0.063+0.506+0.012=0.581 l/s

Calculation 2. Proposed Peak Water Demand.

As per IW Code of Practice an additional 25% should be allowed for for peak time demand, therefore:

0.581 l/s + 25% = 0.73 l/s (Rounded Up)

On-site storage

Fire flow requirements

Calculation 3 - Total Average Foul Wastewater Demand

See calculation of 0.581l/s as per calculation 1 above.

Apply 6 x dry weather flow (dwf), therefore, 6 x 0.573/s = 3.49 l/s (Rounded Up)

Calculation 4 - Total Peak Foul Wastewater Demand

See calculation of 0.73l/s as per calculation 2 above.

Apply 6 x dry weather flow (dwf), therefore, 6 x 0.716/s = 4.36 l/s (Rounded Up)

Guide to completing the pre-connection enquiry form

This form should be completed by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure.

The Irish Water Codes of Practice are available at **www.water.ie** for reference.

Section A | Applicant Details

Question 1: This question requires the applicant or company enquiring about the feasibility of a connection to identify themselves, their postal address, and to provide their contact details.

Question 2: If the applicant has employed a consulting engineer or an agent to manage the enquiry on their behalf, the agent's address and contact details should be recorded here.

Question 3: Please indicate whether it is the applicant or the agent who should receive future correspondence in relation to the enquiry.

Section B | Site details

Question 4: This is the address of the site requiring the water/wastewater service connection and for which this enquiry is being made.

Question 5: Please provide the Irish Grid co-ordinates of the proposed site. Irish grid positions on maps are expressed in two dimensions as Eastings (E or X) and Northings (N or Y) relative to an origin. You will find these coordinates on your Ordnance Survey map which is required to be submitted with an application.

Question 6: Please identify the Local Authority that is or will be dealing with your planning application, for example Cork City Council.

Question 7: Please indicate if planning permission has been granted for this application, and if so, please provide the planning permission reference number.

Section C | Development details

Question 8: Please specify the number of different property/premises types by filling in the tables provided.

Question 9: Please indicate the approximate commencement date of works on the development.

Question 10: Please indicate if a phased building approach is to be adopted when developing the site. If so, please provide details of the phase master-plan and the proposed variation in water demand/wastewater discharge as a result of the phasing of the development.

Question 11: Please indicate the type of connection required by ticking the appropriate box and proceed to complete the appropriate section or sections.

Section D | Water connection and demand details

Question 12: Please indicate if a water connection already exists for this site.

Question 12.1: Please indicate if this enquiry concerns an additional connection to one already installed on the site.

Question 12.2: Please indicate if you are proposing to upgrade the water connection to facilitate an increase in water demand. Irish Water will determine what impact this will have on our infrastructure.

Question 13: Please indicate the approximate date that the proposed connection to the water infrastructure will be required.

Question 14: Please indicate what diameter of water connection is required to service this development.

Question 15: Please indicate if more than one connection is required to service this development. Please note that the connection size provided may be used to determine the connection charge.

Question 16: If this connection enquiry concerns a business premises, please provide calculations for the water demand and include your calculations on the calculation sheet provided. Business premises include shops, offices, hotels, schools, etc. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 17: If this connection enquiry is for an industrial premises, please calculate the water demand and include your calculations on the calculation sheet provided. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak demand for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 18: Please specify the ground level at the location where connection to the public water mains will be made. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 19: Please specify the highest finished floor level on site. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 20: If storage is required, water storage capacity of 24-hour water demand must usually be provided at the proposed site. In some cases, 24-hour storage capacity may not be required, for example 24-hour storage for a domestic house would be provided in an attic storage tank. Please calculate the 24-hour water storage requirements and include your calculations on the attached sheet provided. Please also confirm that on-site storage is being provided by ticking the appropriate box.

Question 21: The water supply system shall be designed and constructed to reliably convey the water flows that are required of the development including fire flow requirements by the Fire Authority. The Fire Authority will provide the requirement for fire flow rates that the water supply system will have to carry. Please note that while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised in the event of a fire, Irish Water cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please include your calculations on the attached sheet provided, and further provide confirmation of the Fire Authority requirements.

Question 22: Please identify proposed additional water supply sources, that is, do you intend to connect to the public water mains or the public mains and supplement from other sources? If supplementing public water supply with a supply from another source, please provide details as to how the potable water supply is to be protected from cross contamination at the premises.

Section E | Wastewater connection and discharge details

Question 23: Please indicate if a wastewater connection to a public sewer already exists for this site.

Question 23.1: Please indicate if this enquiry relates to an additional wastewater connection to one already installed.

Question 23.2: Please indicate if you are proposing to upgrade the wastewater connection to facilitate an increased discharge. Irish Water will determine what impact this will have on our infrastructure.

Question 24: Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.

Question 25: Please indicate what diameter of wastewater connection is required to service this development.

Question 26: Please indicate if more than one connection is required to service this development. Please indicate number required.

Question 27: If this enquiry relates to a business premises, please provide calculations for the wastewater discharge and include your calculations on the attached sheet provided. Business premises include shops, offices, hotels, schools, etc. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 28: If this enquiry relates to an industrial premises, please provide calculations for the wastewater discharge and include your calculations on the calculation sheet provided. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak discharge for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 29: Please specify the maximum and average concentrations and the maximum daily load of each of the wastewater characteristics listed in the wastewater organic load table (if not domestic effluent), and also specify if any other significant concentrations are expected in the effluent. Please complete the table and provide additional supporting documentation if relevant. Note that the concentration shall be in mg/l and the load shall be in kg/day. Note that for business premises (shops, offices, schools, hotels, etc.) for which only domestic effluent will be discharged (excluding discharge from canteens/ restaurants which would require a Trade Effluent Discharge licence), there is no need to complete this question.

Question 30: In exceptional circumstances, such as brownfield sites, where the only practical outlet for storm/ surface water is to a combined sewer, Irish Water will consider permitting a restricted attenuated flow to the combined sewer. Storm/surface water will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer and the applicant must demonstrate how the storm/surface water flow from the proposed site is minimised using sustainable urban drainage system (SUDS). This type of connection will only be considered on a case by case basis. Please advise if the proposed development intends discharging surface water to the combined wastewater collection system.

Question 31: Please specify if the development needs to pump its wastewater discharge to gain access to Irish Water infrastructure.

Question 32: Please specify the ground level at the location where connection to the public sewer will be made. This is required to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 33: Please specify the lowest floor level of the proposed development. This is required in order to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 34: Please specify the proposed invert level of the pipe exiting the property to the public road.

Section F | Supporting documentation

Please provide additional information as listed.

Section G | Declaration

Please review the declaration, sign, and return the completed application form to Irish Water by email or by post using the contact details provided in Section G.

Notes

Notes

Note 1:

Chief Assistant Technical Services Officer ,
Health Service Executive,
Estates West.
Holland Road.
National Technology Park,
Limerick

D. Fallon
Consulting Engineers
Dublin - Galway

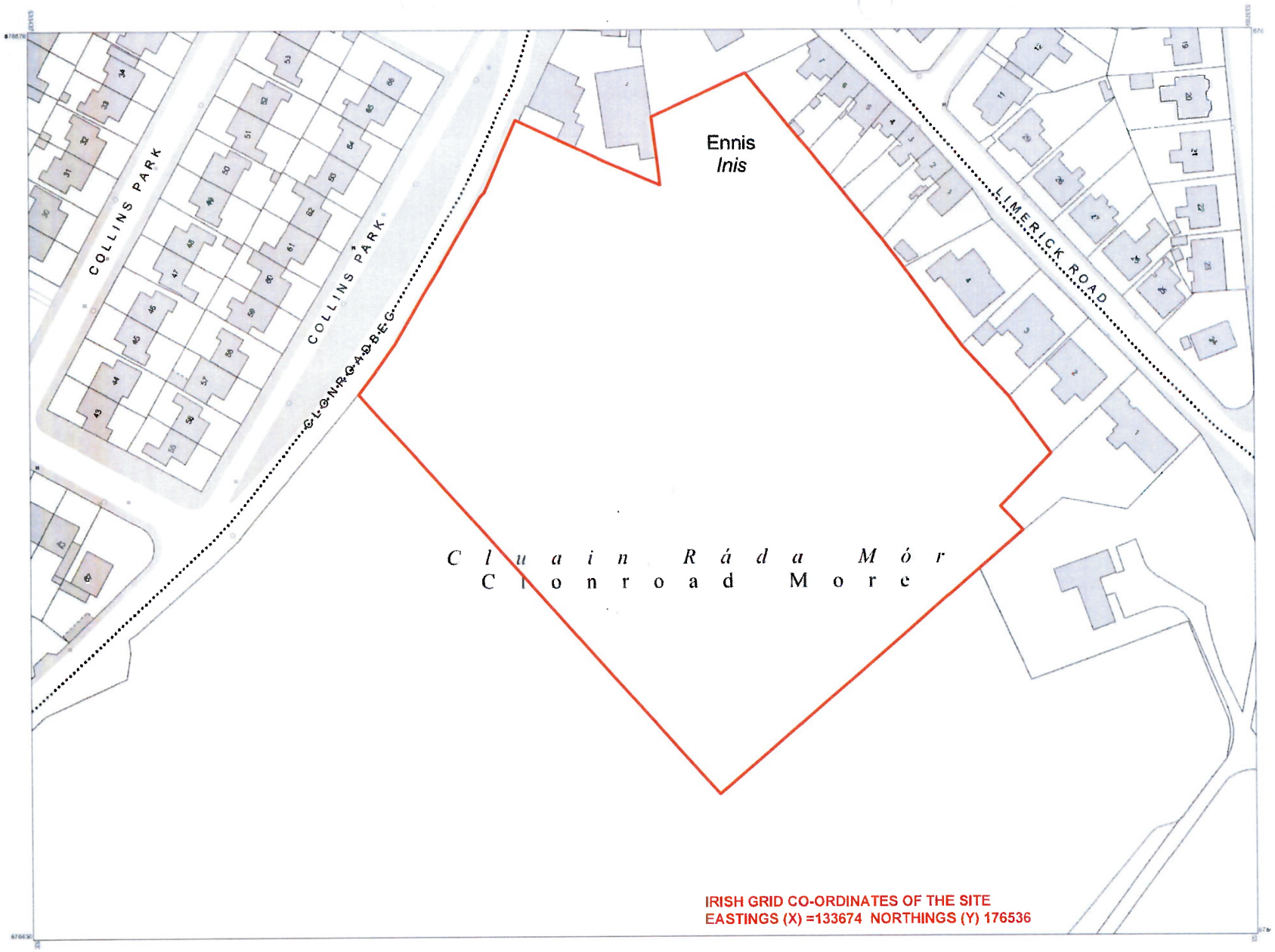
Appendix A:

Site Location Map

Site Layout Plan

G2029DR0002D01 Proposed Foul Drainage Layout

G2029DR0003D01 Proposed Watermain Layout



IRISH GRID CO-ORDINATES OF THE SITE
EASTINGS (X) =133674 NORTHINGS (Y) 176536

REV	DESCRIPTION	DRN	DATE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

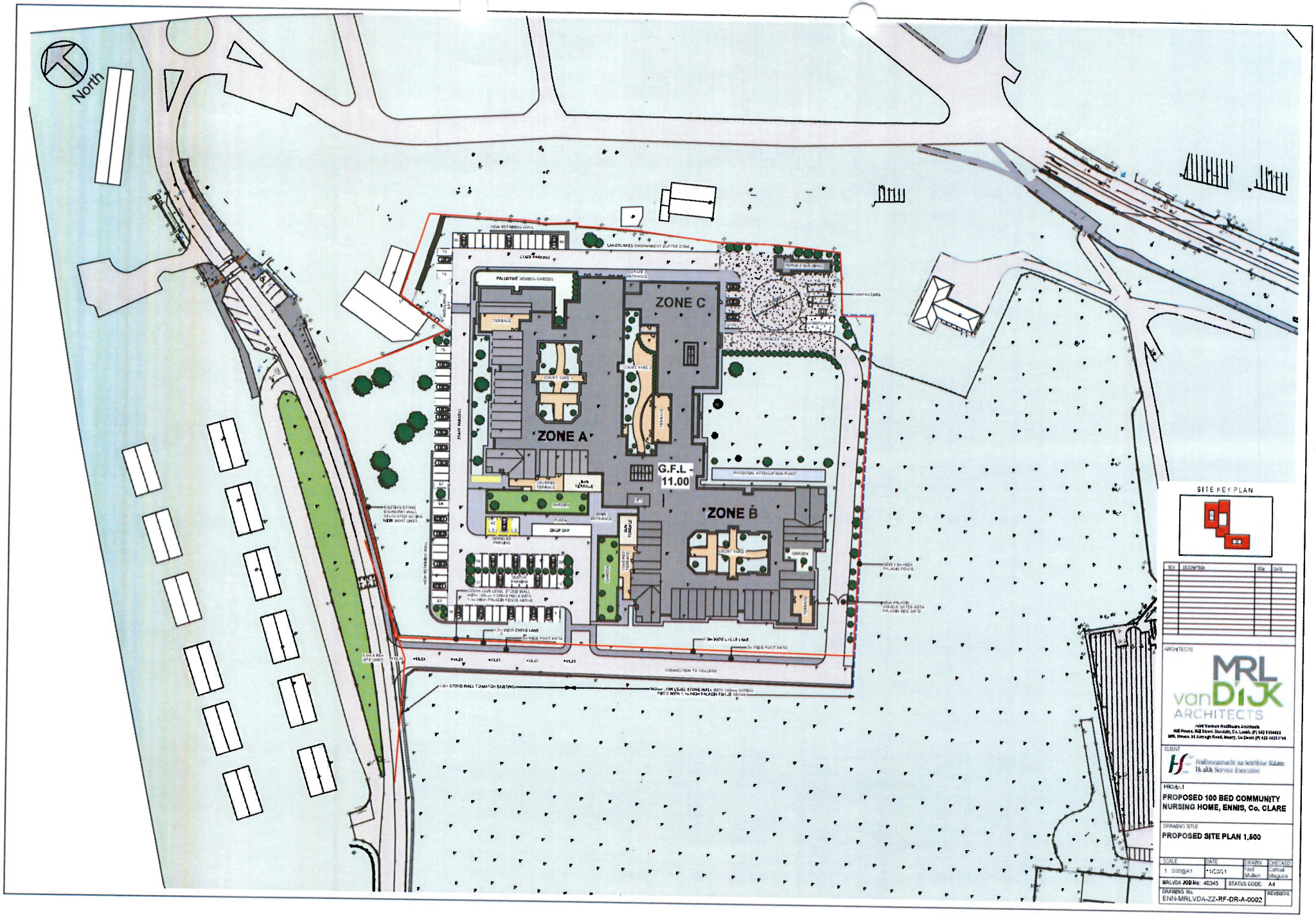
vanDijk Architects
Mill Street
Dundalk, Co.Louth
T: +353 42 9354466
E: info@vandijkarchitects.com
www.vandijkarchitects.com

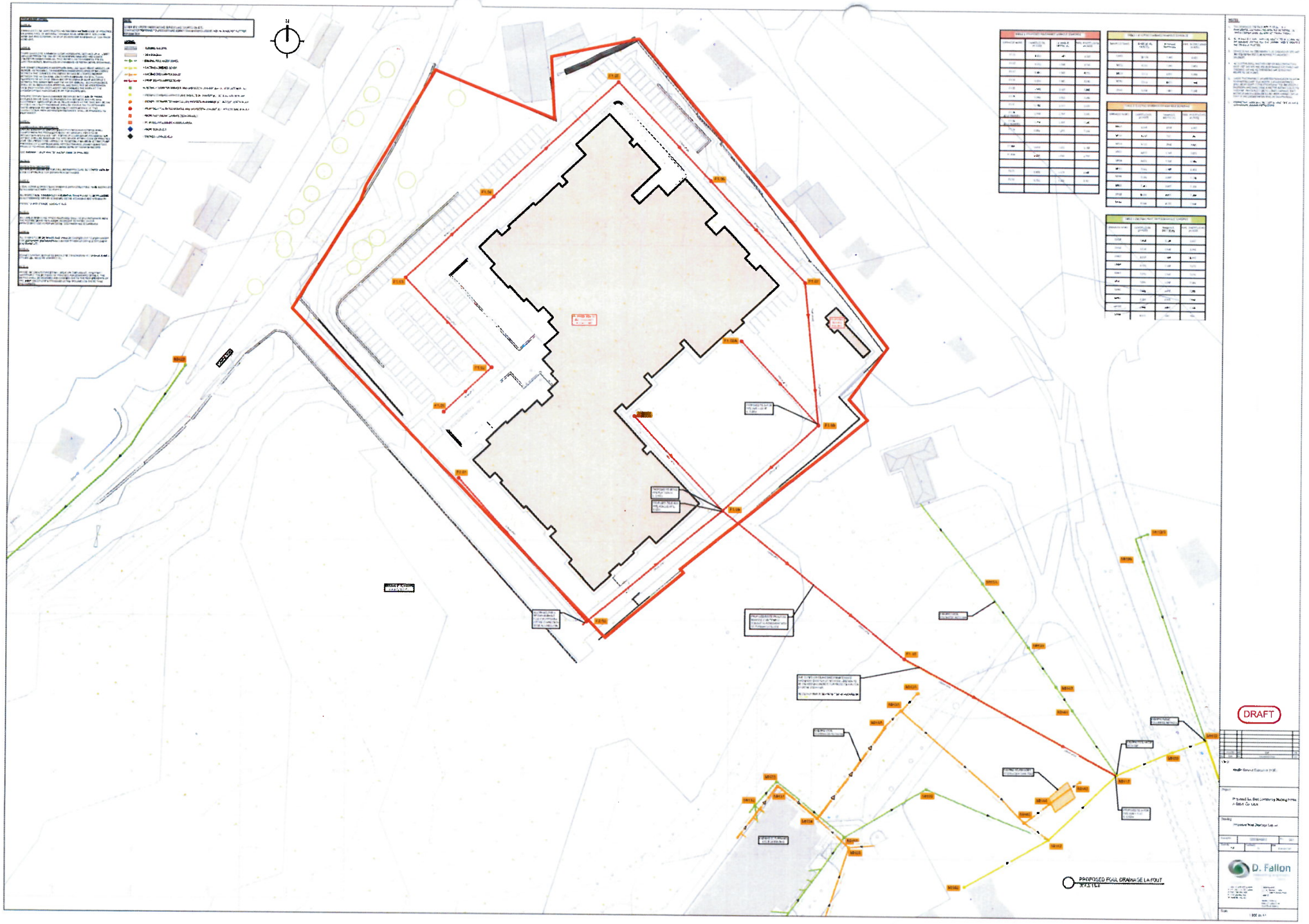
Milligan Reside Larkin
56 Armagh Road, Newry
Co.Down BT35 6DN
T: 028 30 253755
F: 028 30 261035
E: design@mrlarch.co.uk

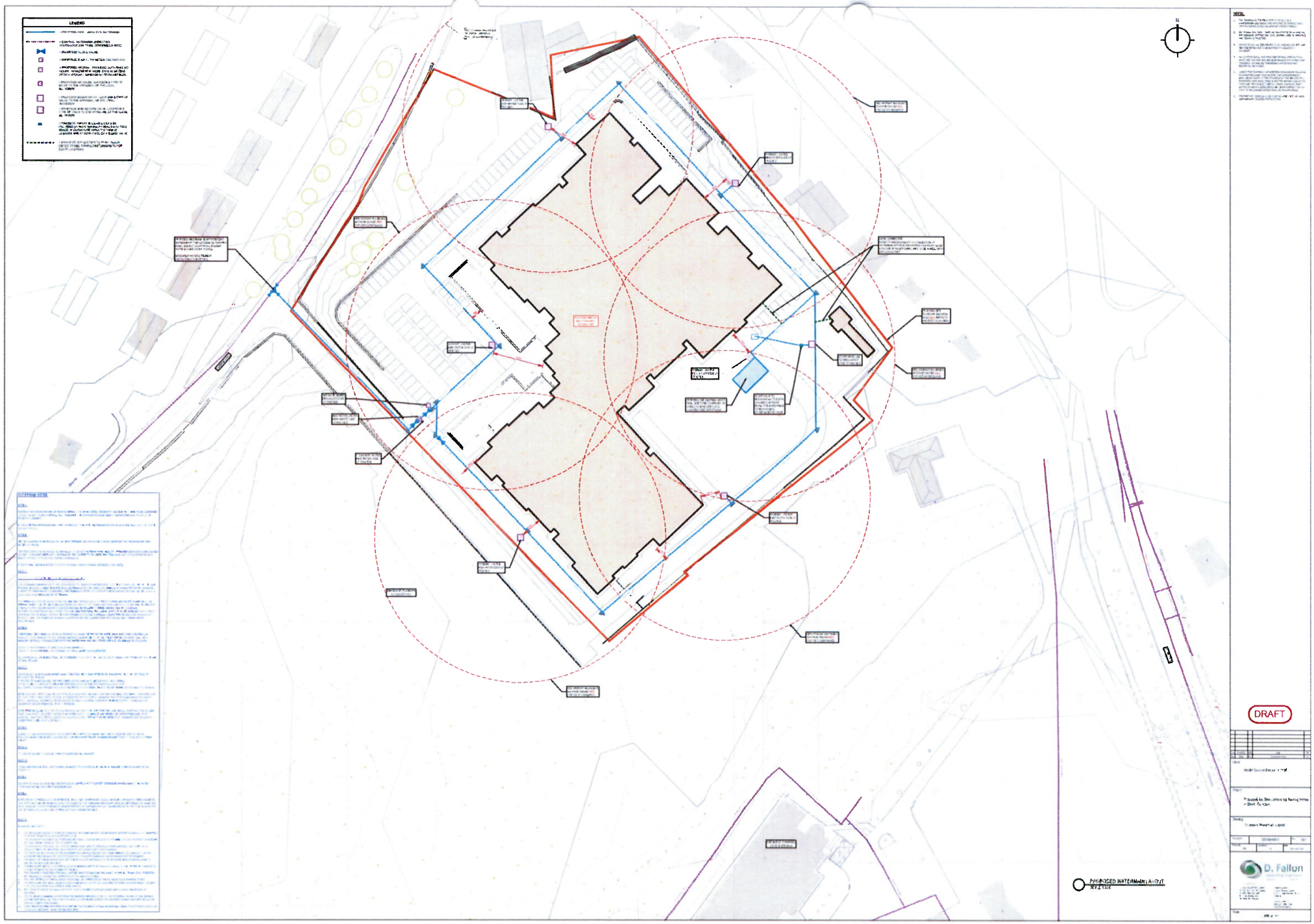
MRL vanDijk ARCHITECTS

Project	PROPOSED 100 BED COMMUNITY NURSING HOME IN ENNIS, Co. CLARE
Title	LOCATION MAP

DATE OF ISSUE	29.10.2021	
SCALE	1 : 1000 @ A3	
DRAWN BY	Neil Mullen	
APPROVED BY	Cathal Maguire	
JOB NO.	40345	REV.
DWG.	ENN-MRLVDA-ZZ-ZZ-DR-A-0051	


North
ZONE A
ZONE B
ZONE C
G.F.L - 11.00
SITE KEY PLAN
ARCHITECTS
MRL vanDIJK ARCHITECTS
CLIENT
Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive
PROJECT
PROPOSED 100 BED COMMUNITY NURSING HOME, ENNIS, Co. CLARE
DRAWING TITLE
PROPOSED SITE PLAN 1:500
SCALE
1 : 500@A1
DATE
11/03/11
DRAWN
Neil Mullen
CHECKED
Cathal Maguire
MRLVDA JOB No. 40345
STATUS CODE: A4
DRAWING No.
ENN-MRLVDA-ZZ-RF-DR-A-0002
REVISION


DRAFT
PROPOSED FOUL DRAINAGE LAYOUT
D. Fallon


LEGEND
PROPOSED WATERMAIN LAYOUT
DRAFT
D. Fallon

D. Fallon
Consulting Engineers
Dublin - Galway

Appendix B:

Hydraulic & Organic Loading Calculations & Design Check

2.0 FW Loading Calculations

A) Average

Source	No.	Hydraulic Loading				Organic Loading		
		Litres/ head / day	Total Hydraulic Loading (litres/day)	Equiv. PE (Total Hyd. load/180)	Max. Flow rate based on 6 DWF (litres/sec)	Loading g/ head/ day	Total Organic, Loading (g/day)	Equiv PE (=Total organic load/60)
Staff	90	60	5,400	30.00	0.38	30	2,700	45.00
Residents	125	350	43,750	243.06	3.04	60	7,500	125.00
Visitors	35	30	1,050	5.83	0.07	10	350	5.83
Total	**250**	--	**50,200**	**278.89**	**3.49**		**10,550**	**175.83**

B) Peak Demand (Average + 25%)

Source	No.	Hydraulic Loading				Organic Loading		
		Litres/ head / day	Total Hydraulic Loading (litres/day)	Equiv. PE (Total Hyd. load/180)	Max. Flow rate based on 6 DWF (litres/sec)	Loading g/ head/ day	Total Organic, Loading (g/day)	Equiv PE (=Total organic load/60)
Staff	90	75	6,750	37.50	0.47	37.5	3,375	56.25
Residents	125	437.5	54,688	303.82	3.80	75	9,375	156.25
Visitors	35	37.5	1,313	7.29	0.09	12.5	438	7.29
Total	**250**	--	**62,750**	**348.61**	**4.36**		**13,188**	**219.79**

Proposed Foulwater Pipeline Run (F1.01-F1.10)												
USMH	Drop MH	USIL	DSMH	Drop MH	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
			F1.01	No	9.320	0.000						
F1.01	No	9.320	F1.02	No	9.145	21.000	21.000	120	150	0.15	18.86	1.07
F1.02	No	9.145	F1.03	No	8.935	61.500	40.500	193	225	0.15	43.03	1.08
F1.03	No	8.935	F1.04	No	8.745	99.750	38.250	201	225	0.15	42.13	1.06
F1.04	No	8.745	F1.05	No	8.465	154.250	54.500	195	225	0.15	42.80	1.08
F1.05	No	8.465	F1.06	No	8.245	197.750	43.500	198	225	0.15	42.46	1.07
F1.06	No	8.245	F1.07	No	8.025	242.250	44.500	202	225	0.15	42.02	1.06
F1.07	No	8.025	F1.08	Yes	7.800	288.000	45.750	203	225	0.15	41.92	1.05
F1.08	Yes	7.800	F1.09	Yes	7.600	328.750	40.750	204	225	0.15	41.81	1.05
F1.09	Yes	7.600	F1.10	No	7.225	403.750	75.000	200	225	0.15	42.24	1.06
F1.10	No	7.225	MH12	No	**6.850**	480.750	77.000	205	225	0.15	41.70	1.05
Note: Refer to Existing Drainage Layout G2029DR0001, Proposed Development assumes tie-in at MH13 Invert Level = 6.850m												

Proposed Foulwater Pipeline Run (F1.08A-F1.08)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
			F1.08A	No	9.200	0.000						
F1.08A	No	9.200	F1.08	Yes	8.800	36.000	36.000	90	150	0.15	21.89	1.24
			F1.08	Yes	7.800							
Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.08 Invert Level = 8.800m (Drop Manhole Required)												

Proposed Foulwater Pipeline Run (F1.09A-F1.09)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
			F1.09A	No	9.750	0.000						
F1.09A	No	9.750	F1.09	Yes	9.350	40.500	40.500	101	150	0.15	20.62	1.17
			F1.09	Yes	7.600							
Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.09 Invert Level = 9.350m (Drop Manhole Required)												

Proposed Foulwater Pipeline Run (F2.01-F1.09)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
			F2.01	No	9.625	0.000						
F2.01	No	9.625	F2.02	No	9.325	61.500	61.500	205	225	0.15	41.70	1.05
F2.02	No	9.325	F1.09	Yes	9.025	118.500	57.000	190	225	0.15	43.38	1.09
			F1.09	Yes	7.600							
Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.09 Invert Level = 9.025m (Drop Manhole Required)												

Pre-Connection Enquiry CDS21008799 - Turnpike Road, Ennis, Clare

Assessment Period: 13/12/21 – 29/04/22

The Uisce Eireann/Irish Water assessment process (desktop analysis) of capacity currently available in the Uisce Eireann/Irish Water networks involves input from three stakeholders.

1. Local Authority Water Services;
2. Uisce Eireann/Irish Water Connections & Developer Services (CDS) Design team;
3. Uisce Eireann/Irish Water Asset Planning.

1. Local Authority Water Services

Water Assessment

From: Conor Marrinan
Sent: 21 December 2021 16:05
To: Deirdre O'Keeffe
Subject: RE: CDS21008799 PCE for water and Waste water for HSE Midwest, Turnpike Road, Ennis, Co. Clare - 100 bed Community Nursing Unit

Hi Deirdre,

Application filled out and saved in 365.

Connection is feasible.

"Magmeter required to IW standards at connection point to public network"

Thanks,

Conor

Conor Marrinan

Executive Engineer
Water Services Department
Clare County Council, Waterpark House, Drumbiggle Road, Ennis, Co. Clare, V95 N1NR
T: [redacted] | **E:** [redacted] | **W:** www.clarecoco.ie

D365 Water Assessment

Drinking Water Connection	
Existing IW main adjacent to the site?	Yes
Is the development multi-phased?	No
Water Treatment Plant	DRUMCLIFFE WTP
Water Supply Scheme	Ennis PWS

Infrastructure Assessment	
Upgrade to WTP required for development?	No
Upgrade to water network reqd. for development?	Yes
Constraints and potential solutions (IW Network)	Magmeter required at connection point to IW standards
Existing IW water asset within the site	No

Assessment Summary	
Type of Development	Business Connection
Existing IW main adjacent to the site?	Yes
Are Water Infrastructure upgrades required?	Yes
Impacts to IW Water Infrastructure	No
Outcome	Refer to CDS

Wastewater Assessment

From: Patrick Tiernan
Sent: 31 January 2022 16:40
To: Deirdre O'Keeffe
Subject: RE: CDS21008799 PCE for water and Waste water for HSE Midwest, Turnpike Road, Ennis, Co. Clare - 100 bed Community Nursing Unit

Deirdre,

Waste water section is complete.

Paddy

D365 Wastewater Assessment

Wastewater Connection	
Existing IW sewer adjacent to the site?	Yes
Existing mains dia. for connection	>300
Material of existing wastewater sewer	Concrete
Is the development multi-phased?	No
Wastewater Treatment Plant	Clareabbey WWTP

Infrastructure Assessment	
Upgrade to WWTP required for development?	No
Upgrade to IW network required for development?	Yes
Constraints and potential solutions (IW Network)	Westfields Pump Station under pressure during inclement weather. Foul network also floods in Toberteascain during inclement weather. Proposed solutions - upgrade Westfields PS and/or new main foul sewer direct from Clare Road to Westfields PS. A possibility also exists

	to pump Kildysart Cross PS direct to Clareabbey WwTP. Currently Kildysart cross pumps to Westfields before being pumped on again to Clareabbey WwTP. Pumping directly from Kildysart cross to Clareabbey would relieve significant pressure at Westfields.
Intent to discharge surface water	No
Existing IW water/wastewater asset within the site	No
Diversion required for development?	No
Provide details on Impact	Existing sewer network under pressure especially in times of inclement weather. Westfields pump station struggles with incoming flows during inclement weather. Inclement weather also leads to sewage flooding in Toberteascain due to links between storm and foul network
Potential impact on IW infrastructure?	Yes

Assessment Summary	
Type of Development	Business Connection
Existing IW sewer adjacent to the site?	Yes
Wastewater Infrastructure upgrades required?	Yes
Surface water to be discharged to the IW network?	No
Impacts to IW Wastewater Infrastructure	Yes
Outcome	Refer to CDS

2. Uisce Eireann/Irish Water Connections & Developer Services (CDS) Design team

Constraints identified in the Local Authority Water Services Assessment. CDS assess the proposed connection and the Constraints identified to determine if further assessment is required by Asset Planning.

Water Treatment Plant Capacity Register assessed:

Local Authority	Water Supply Zone Name	WSZ Code	Plant Name (Local Name)	24hr. Production Capacity (m3/day)	Abstraction Safe Reliable Yield (m³/day)	Daily Production (m3/day)	Available Water production (m³/day)	Standard Housing Unit Headroom
Clare	Ennis PWS	0300PU01009	Drumcliffe WTP	16000	18300	14800	1200	1225.81

Wastewater Treatment Plant Capacity Register assessed:

UISCE WATER

Settlements with Waste Water Discharge Authorisations - Wastewater Treatment Capacity
Waste Water Discharge Licences (WWDL) and Certificates of Authorisation (CoA)

29th April 2020

Region	County	Settlement	Census pop. (2016)	Wastewater Treatment Plant (WWTP)	Reg #	Serves other areas?	WWTP Capacity (PE)		Load (PE) 2019	Headroom (PE)		Current project completion year
							Today	Upon works completion		WWDL ELV Capability	UWW Standards Capability (not WWDL ELVs)	
5	Clare	Ennis	incl.	Clareabbey WWTP	D0199	Yes	6,000	Not yet defined	4,742	0	1,258	Post 2024

Headroom (PE)
WWDL Capability
UWW Standards Capability (not WWDL ELVs)

Headroom available at the WWTP in 2019 in terms of population equivalents based on available capacity now or by completion of a project by **2022** (where relevant)

Green = spare capacity available.

Amber = potential spare capacity. WWTP currently not compliant with Waste Water Discharge Licence emission limit values but is capable of achieving at least UWW standards. Potential availability of capacity in this case would be dependent on any additional load not resulting in a significant breach of the combined approach as set out in Regulation 43 of the Waste Water Discharge (Authorisation) Regulations 2007.

Capital Needs Assessment - Treatment	
Referral to Water Treatment Required	No
Referral to Wastewater Treatment Required	Yes
Reason for Referral (Wastewater treatment)	Constraints Identified

Capital Needs Assessment - Network	
Referral to Water Networks Required	Yes
Reason for Referral (Water Networks)	Constraints Identified
Referral to Wastewater Networks Required	Yes
Reason for Referral (Wastewater Network)	Constraints Identified

3. **Uisce Eireann/Irish Water Asset Planning**

Wastewater Treatment Capacity Assessment	
Upgrade/Extension of the existing WWTP required?	Yes
Provide details on WWTP Works required	Upgrade of the Clonroadmore WWTP* is included in the Irish Water Investment Plan. Project is currently at Feasibility stage. Proposed development can progress ahead of the upgrade to the wastewater treatment plant.
**The LA identified Clareabbey WWTP as the relevant WWTP however Asset Planning confirmed this area is connected to the Clonroadmore collection network which drains to the Clonroadmore WWTP.*	

Wastewater Network Assessment	
Extension/upgrade of the existing network Rqd.? WW	Yes
Provide details on WW Net. Assess works rqd.	Extg network has capacity for foul only load from this site. Storm run-off will not be accepted. Developer to provide details of how he is dealing with run-off, and demonstrate that it does not end up in IW sewer away from the site. IW will progress any upgrades on Westfields WWPS directly.

Water Network Assessment	
Extension/upgrade of the existing network Rqd.? DW	No

UISCE ÉIREANN : IRISH WATER

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

Alan Armstrong
Office 25,
Calbro Court, Tuam Road,
Galway
H91YKH

29 April 2022

Re: CDS21008799 pre-connection enquiry - Subject to contract | Contract denied

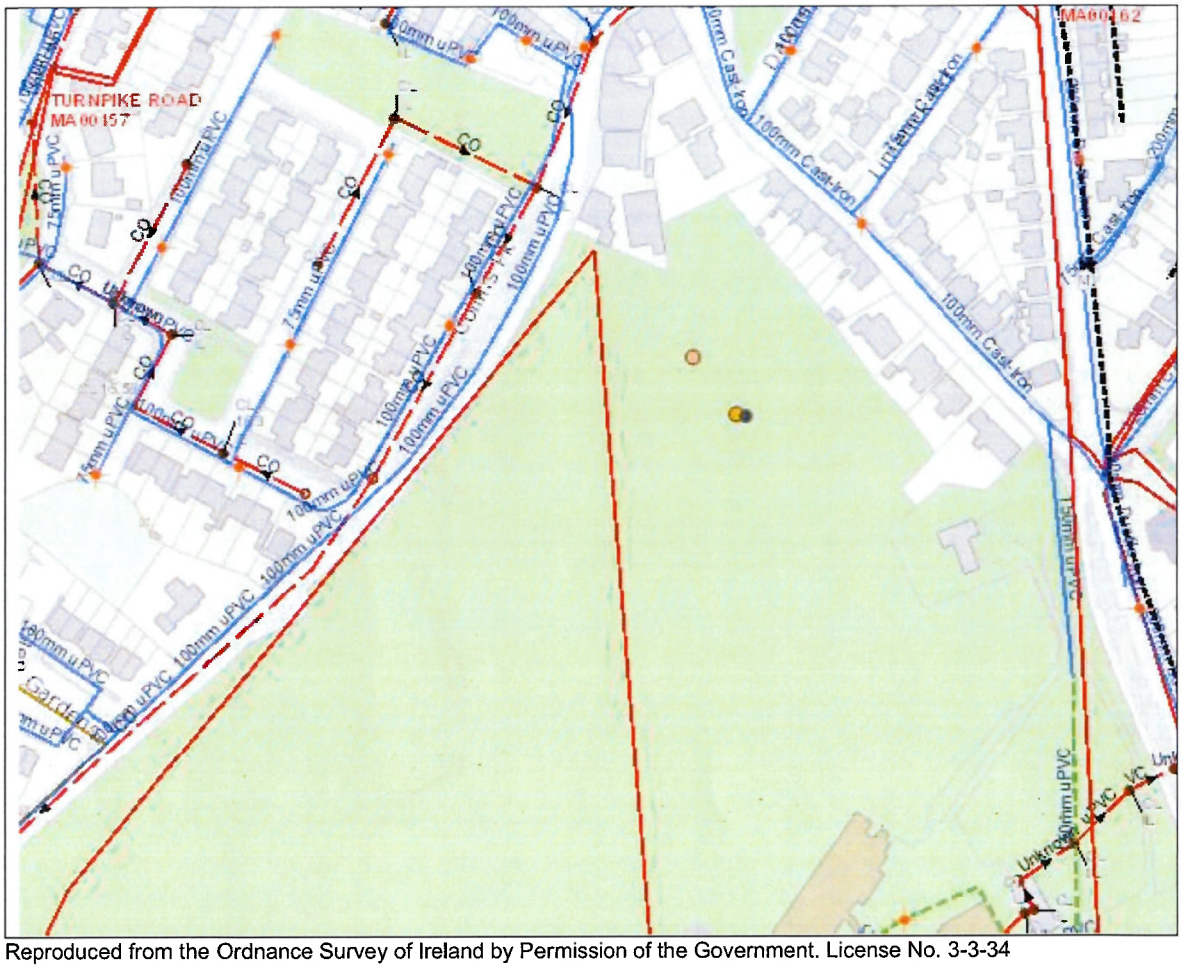
Connection for Business Connection of 1 unit(s) at Turnpike Road, Ennis, Clare

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Turnpike Road, Ennis, Clare (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	There is sufficient capacity for the proposed development.
Wastewater Connection	There is sufficient capacity for the proposed development.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Shane Mcmanus from the design team by email to [redacted] For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations