PROPOSED HOUSING DEVELOPMENT AT CULLAIRBAUN, ATHENRY, CO. GALWAY

SERVICES DESIGN REPORT

CLIENT.	GALWAY COUNTY COUNCIL
PROJECT NO.	24181-B
DOCUMENT NO.	24181-B-SDS-XX-RP-C-0001-01
DATE	FEBRUARY 2025

REV. 01

DOCUMENT TITLE SHEET

Client:	Galway County Council, Aras An Chontae, Galway, Co. Galway, H91 H6KX.
Project Description:	The proposed development at Cullairbaun, Athenry Co. Galway. The construction of 13no. units (compromising; 8no 2-Bedroom 3-Person Units; 4no 1-Bed 2-Person Units; 1no Care Home Units). Construction of storage shed; and connection to existing services together with all ancillary site development works.
Project. No.	24181-B

DISCLAIMER

DOCUMENT CONTROL SHEET

PROJECT No:	24181-B				
PROJECT NAME:	Proposed Housing Development at Cullairbaun, Athenry Co. Galway.				
DOCUMENT REF:	P:\2024\24181 - Galway CC-PKA - Athenry Housing Scheme\Design\2 - Civil Design\02 Cullairbaun - Service Design Report				
REVISION	**DATE**	**DESCRIPTION**	Services Design Report		
01	17/02/2025		PREPARED	CHECKED	ISSUED
		INITIALS:	MW	CD	CD
		DATE:	17/02/2025	17/02/2025	17/02/2025
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1 INSTRUCTION

SDS Design Engineers have been appointed by the Client Galway County Council, to prepare a Services Design Report to accompany a Planning Application to Galway County Council for the proposed development, Cullairbaun, Athenry Co. Galway.

2 PROJECT DETAILS

The proposed development at Cullairbaun, Athenry, Co. Galway comprises of the development of dwellings a care home.

The proposed development comprises of the following:

- Formation of two new development entrances
- Construction of 13no. Dwellings (comprising of: 8 no. 2-Bedroom units; 4 no. 1-Bedroom units and 1 no. care home consisting of 3 no independent living areas; 1 no. high dependency unit; communal kitchen area; communal living area; caretakers unit.)
- construction of storage shed at back of care home.
- all ancillary site development works

Figure 2.1 shows the proposed site layout plan for the new development.

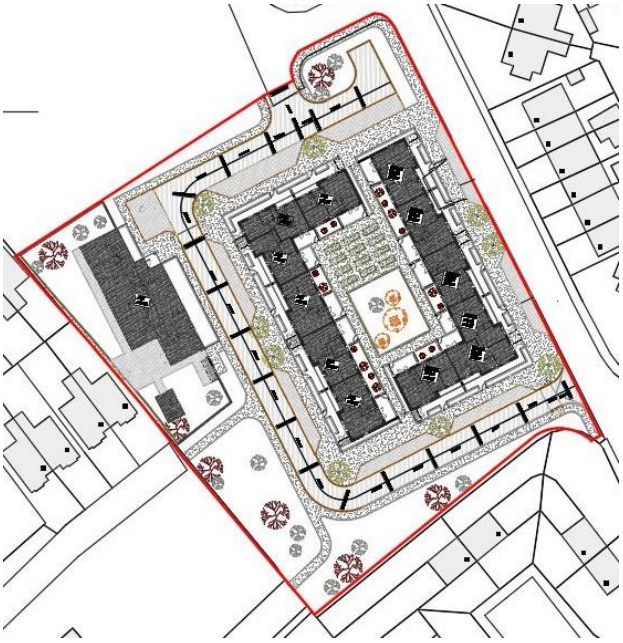


Figure 2.1 – Proposed Site Layout Plan

3 SITE LOCATION, SITE DESCRIPTION

The application site is a greenfield site located in the townland of Cullairbaun in Athenry Co. Galway. (Figure 3.1). The site is located on the southern edge of the current Cullairbaun housing estate, next to the R347 (Park Road), and to the northern edge of the Cluain Lara estate, next to the L3105(Raheen Road). The site has an area of approximately 0.69 hectares (6,955.36m^2 | 1.7 acres). This application includes all the required drawings for the drainage and Sustainable urban Drainage Design Systems (SuDS), foul, and watermain works.

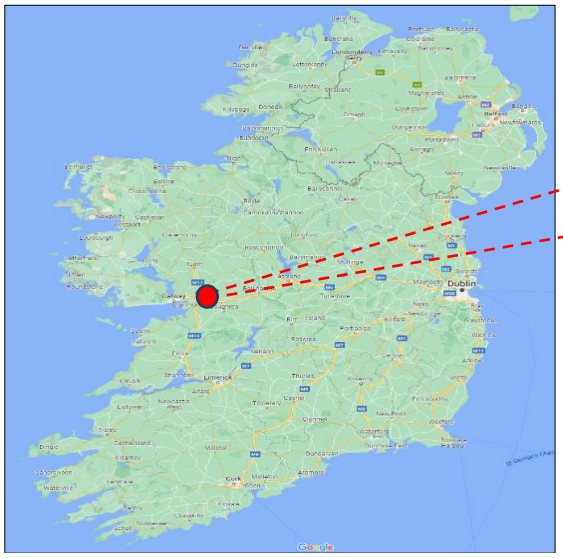


Figure 3.1 - Site Location *(image courtesy of Google Maps)*

Figure 3.2 – Site location at Cullairbaun, Athenry Co. Galway *(image courtesy of Google Maps)*

Figure 3.3 – Areal view of proposed site *(image courtesy of Google Maps*

4 BACKGROUND SURVEYS

4.1.1 Site Topography

A topographical survey was conducted by Apex Surveys in October 2024. The existing site falls from north to south with a gradient of approximately 1:74. The proposed runoff from the site will mimic the existing topography of the site. Topographical survey of the existing site is presented in Appendix A.

4.1.2 GROUND CONDITIONS

In order to assertain the existing ground counditions a site investigation was carried out by Site Investigations Ireland Ltd on the November 2024. The site invesigation includes the following elements:

- 5 No. Trial Pits
- 5 No. Boreholes
- 4 No. Plate Tests
- 4 No. Soakaway Tests

Figure 4.1 below shows the extend of the site investigation. Soil stratification was detrmined from TP01, TP02, & TP03 topsoil overlying brown gravelly firm CLAY**.** Made ground was identified at TP04 & TP05. Infiltration testing was carried out in accrodance with BRE Digest 365 *Soakway Design*. Site testing yielded poor infiltration rates as expected due to the presence of CLAY. According to the GSI, the exsiting site is underlain by limestone. Refer to Appendix B for Site Investigations Ireland site invesigation report.

Figure 4.1 Site investigation locations (Source: Site Investigations Ireland LTD)

5 FLOOD RISK

To establish if there is a risk of flooding to the proposed development and its location a desktop-based flood risk study was undertaken. As part of this study, several informative reports, studies, and records were reviewed to determine if risk of flooding was an issue. The following sources of information was used in order to determine if the proposed site poses a flood risk:

- Historic flood maps and reports from OPW (www.floodinfo.ie)
- Western Catchment Flood Risk Assessment and Management (CFRAM)
- Galway County Council Development Plan 2022-2028.

5.1 Historic Flooding

Figure 5.1 below shows the past flood events within 2.0 km zone of Athenry. Flooding was noted in December 2015; the extent of the flooding is unknown.

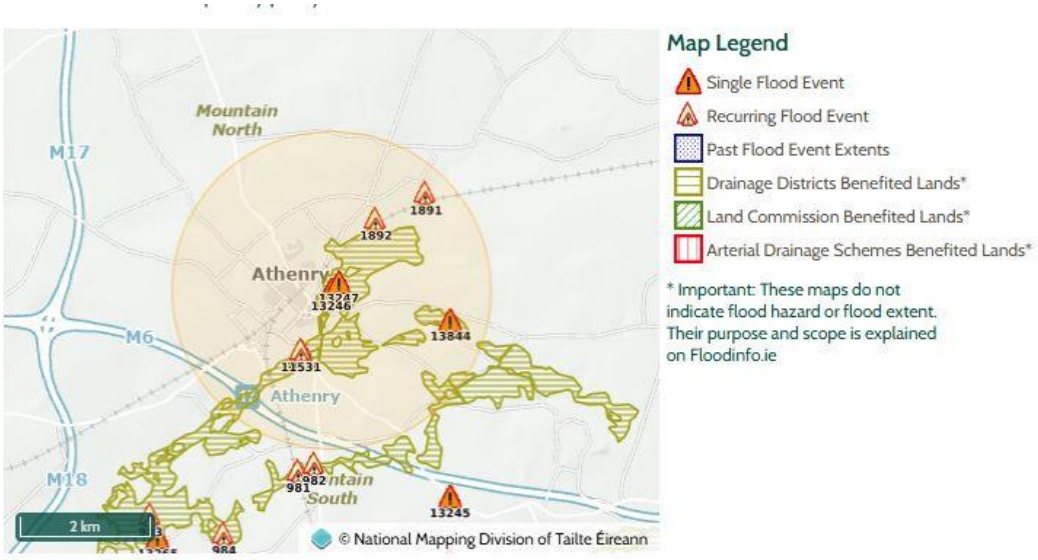


Figure 5.1 – Past flood events within 2.0Km of proposed site (Source: www.floodinfo.ie)

5.2 Flood Maps

Based on a review of the Western Catchment Flood Risk Assessment and Management (CFRAM) study it can be noted that proposed site is located within Flood Zone C (where the probability of flooding from rivers and the sea is low (less than. 0.1% or 1 in 1000 for both river and coastal flooding). Figure 5.2 below shows the flood map for the proposed site.

Figure 5.2 – Flood Map (Source: County Mayo Strategic Flood Risk Assessment 2022)

5.3 Mitigating Risks

The proposed storm network strategy will pose a minimal risk to the proposed site and surrounding area. Thus, the following mitigating measures include:

1. The proposed drainage network including the SuDS features which shall be maintained on a regular basis to reduce the risk of a blockage.
2. The runoff from the site is discharged to the existing surface water network with a hydrobrake at a restricted flow rate of 6.2l/s.
3. SuDS features are designed in accordance with Greater Dublin Strategic Drainage Study recommendations (1 in 100-year flood event plus 30% climate change due to global warming).

6 LOCAL AUTHORITY

Galway County Council will be provided with the relevant drawings and the associated design calculations for the services proposed for this development for consideration.

7 SURFACE WATER STRAGETY

The following section outlines the hierarchy of options when considering the removal and disposal of surface water from site, before outlining a host of potential sustainable urban drainage system (SuDS) techniques considered when designing the surface water collection system for the proposed site. The proposed surface strategy was designed in accordance with the following guidelines/polices:

- The SUDS Manual (C754,2015)
- Galway County Council Development Plan 2022-2028.
- Greater Dublin Strategic Drainage Study (GDSDS)

It is proposed that SuDS techniques are implemented wherever possible to manage surface water runoff from the development. Surface water management proposals for the site have been articulated to mimic the natural drainage patterns of the existing site.

7.1 HIERARCHY OF DISPOSAL

Generally, when designing a proposed surface water collection system, the philosophy of the design should be to prioritise the below methods of discharging surface water run off as much as reasonably practicable, from 1 (most desirable) to 5 (least desirable):

1. Collect for Re-Use
2. into the ground (infiltration),
3. To a surface waterbody,
4. To a surface water sewer, highway drain, or other drainage systems,
5. To a combined sewer.

Table 6.1 below shows a summary of the hierarchy of disposal for the proposed development. The surface water hierarchy of disposal will be based on a priority level 4 due to site constraints.

Table 6.1: Hierarchy of Disposal

Hierarchy	Priority Level	Discharge Location	Availability Y/N	Comments
	1	Collect for Use	N	Rainwater harvesting is deemed unpracticable due to the low water demand.
	2	Into the ground - Infiltration	N	Infiltration testing was carried out and results show that the poor infiltration rates and therefore infiltration has been disregarded.
	3	To a Surface Waterbody	N	There are no surface waterbodies close to this site and therefore discharge to a surface waterbody has been disregarded
	4	Discharge to a surface water sewer, highway drain, or another drainage system	Y	Discharge to an existing local Authority storm network.
	5	Discharge to a combined sewer	N	According to Uisce Eireann records a combined sewer is not present.

1. COLLECT FOR Re-USE

The low water demand for the proposed development does not warrant rain harvesting system as it would involve pumping of water which would outweigh the cost saving and therefore the scheme does not include collection for reuse.

2. INTO THE GROUND - INFILTRATION

Infiltration testing was carried out on 4 no. trial pits in accordance with BRE Digest 365 and yielded poor infiltration rates. As a result of this, such findings consequently make infiltration an unviable option for the surface water treatment of the proposed development, therefore making controlled discharge and storage the proposed treatment option.

3. TO A SURFACE WATERBODY

There are no surface water bodies located in close proximity to this site therefore, this scheme does not include discharge to a surface waterbody in its scheme.

4. DISCHARGE TO A SURFACE WATER, HIGHWAY DRAIN, OR ANOTHER DRAINAGE SYSTEM

An existing surface water network runs in the existing Cullairbaun estate road at the east of the proposed site. This existing network will be utilised to serve the proposed development.

5. DISCHARGE TO A COMBINED SEWER

According to Uisce Eireann records a combined sewer is not present near the site.

7.2 COMPLINACE WITH SuDS PRINCIPLES

7.2.1 Compliance with C573 SuDS Manual

The C573 SuDS Manual explains that the primary function of SuDS measures is to protect watercourses from any impact due to the new development. However, SuDS can also improve the quality of life in a new development and urban spaces by making them more vibrant, visually attractive, sustainable and more resilient to change. This document explains the wider social context of SuDS and how SuDS can deliver high quality drainage while supporting urban areas to cope better with sever rainfall both now and in the future. There four pillars of SuDS include:

1. Water Quantity (mitigate flood risk & protect natural water cycle)
2. Water Quality (manage the quality of the runoff to prevent pollution)
3. Amenity (create and sustain better places for people)
4. Biodiversity (create and sustain better places for nature)

7.2.2 SuDS Management Train

The SuDS measures proposed are usually linked in series, and this is commonly known as a SuDS Management Train, (SMT). The SMT ensures that surface runoff is captured, conveyed, stored, intercepted, and removed of pollutant correctly and efficiently before it is discharged back into the surrounding watercourse/network. This approach will ensure that the most effective measures are utilised in the correct sequence throughout the site. Table 26.7 (Figure 7.1) (CIRIA, SuDS Manual 2015) demonstrates the effectiveness of each SuDS measure along the SMT.

TABLE 26.7 Indicative suitability of SuDS components within the Management Train

SuDS component	Interception[1]	Close to source/ primary treatment	Secondary treatment	Tertiary treatment
Rainwater harvesting	Y			
Filter strip	Y	Y		
Swale	Y	Y	Y	
Filter drain	Y		Y	
Permeable pavement	Y	Y		
Bioretention	Y	Y	Y	
Green roof	Y	Y		
Detention basin	Y	Y	Y	
Pond	[3]	Y[2]	Y	Y
Wetland	[3]	Y[2]	Y	Y
Infiltration system (soakaways/ trenches/ blankets/basins)	Y	Y	Y	Y
Attenuation storage tanks	Y[4]			
Catchpits and gullies		Y		
Proprietary treatment systems		Y[5]	Y[5]	Y[5]

Figure 7.1 CIRIA C573 SuDS Manual Table (Source: The SUDS Manual C754,2015)

7.3 SUSTAINABLE URBAN DRAINAGE SYSTEMS

The following section outlines the potential SuDS techniques considered for the proposed site, with proposals such as green roofs, Soakways, swales, and modular systems all being discussed herein.

7.3.1 RAINWATER HARVESTING

Rainwater harvesting (RWH) is the collection of rainwater runoff for use. Runoff can be collected from roofs and other impermeable areas, stored, treated (where required) and then used as a supply water for domestic, commercial and/or institutional properties. As previously discussed RWH will be disproportionate in terms of cost and function with regards to the proposed development features (toilet, sinks etc.) Therefore, rainwater harvesting has been disregarded for this design.

7.3.2 GREEN ROOFS

Green roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows. Due to the A-frame roof for the proposed dwellings green roofs have been disregarded.

7.3.3 SOAKAWAYS

Soakaways are square or circular excavations either filled with rubble or lined with brickwork, precast concrete or polyethylene rings/perforated storage structures surrounded by granular backfill. They can be grouped and linked together to drain large areas including highways. The supporting structure and backfill can be substituted by modular geo-cellular units. Soakaways provide storm water attenuation, storm water treatment and groundwater recharge. Soakaways have been disregarded due to poor infiltration rates encountered during site testing.

7.3.4 SWALES

Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate. They should promote low flow velocities to allow much of the suspended particulate load in the storm water runoff to settle out, thus providing effective pollutant removal. Swales have not been considered for this development.

7.3.5 TREE PITS

Tree pits are beneficial for bioretention as they intercept precipitation, allow water to evaporate from relief surfaces, facilitate infiltration and groundwater recharge due to their root systems, provide shade, and provide further amenity and biodiversity benefits. However, with alternative methods of surface water treatment being proposed site-wide, tree pits have been disregarded for this development.

7.3.6 PERVIOUS PAVEMENTS

Pervious pavements provide a pavement suitable for pedestrian and/or vehicular traffic while allowing rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored between infiltration to the ground, reuse or discharge to a watercourse or other drainage system. Pavements with aggregate sub-bases can provide good water quality treatment. When permeable paving for car parking bays is used, the stone sub-base not only stores and slows down the rate of discharge, but also raises the water quality. Pervious pavements has been disregarded due to maintenance and the high cost involved.

7.3.7 GEO-CELLULAR / MODULAR SYSTEMS

Modular plastic geo-cellular systems with a high void ratio can be used to create a below ground storage structure. Modular tanks can be used for runoff attenuation but require silt trap protection and a suitable means of access for cleaning and inspection. A geo-cellular system has been adopted as an attenuation system with an attenuation tank of 200m3 and this will provide adequate storage for the proposed site.

7.3.8 PONDS / RAIN GARDENS / INFILTRATION BASINS

Ponds can provide both storm water attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline. Runoff from each rain event is detained and treated in the pool. The retention time promotes removal of silt through sedimentation and the opportunity for biological uptake mechanisms to reduce nutrient concentrations. As the proposed site is residential and ponds have not been considered as it would pose a risk of drowning.

7.3.9 EXISTING SURFACE WATER

Currently, there is existing surface water infrastructure serving the proposed site to the east of the proposed development. Refer to Appendix B for Uisce Eireann map records. The surface water from the proposed site will be discharged to this existing network.

7.4 PROPOSED SURFACE WATER COLLECTION SYSTEM

The proposal for this development is to provide a new surface water collection network, collecting surface water run-off through roof gutters, & downpipes.

The surface water is routed directly into the proposed surface water network towards SW04 where it will pass through a klargester NSBE010 petrol and oil separator before entering the proposed attenuation tank in the southwest corner of the site. A hydrobrake is to be located in SW MH 06 which will restrict the outflow from the site, limiting the surface water flow from the site to a discharge of 6.2 l/s

7.4.1 OUTFLOW FROM SITE

A HydroBrake Optimum by Hydro International (or similar equivalent) will be provided within proposed surface water manhole SW 06 to limit the outflow as outlined above. Refer to drawing no drawing 24181-B-3020-PL2 for proposed discharge location.

7.4.2 SURFACE WATER ATTENUATION SYSTEM

As previously mentioned, the surface water attenuation system includes a Graf EcoBloc attenuation system. In total, this SuDS feature provides a cumulative surface water storage volume of approx. 200m3. This has been designed to provide storage for the surface water generated in a 1 in 100-year rainfall event. The rainfall generated in such an event will be increased by an allowance of 30% to cater for predicted climate change due to global warming as per GDSDS requirements. This storage volume of 200m3 will be adequate in terms of treating and storing surface water in the event of the aforementioned rainfall event. For calculations regarding surface water attenuation system design, please see appendix C, where a maximum rainfall volume to treat of 164m3 is calculated. Whilst carrying out the surface water attenuation design, rainfall return period data was utilised from Met Eireann, which is viewable in Appendix D.

PROPOSED SUDS STRATEGY

The proposed SuDS features will be integrated into the surface water drainage network for the proposed development, with the main objective of controlling the quantity of surface water runoff, managing the quality of runoff to prevent pollution, and creating sustaining local ecosystems. The proposed SuDS strategy for the site include the following:

- 1 No. Graf EcoBloc Attenuation Tank – The proposed attenuation tank shall assist with providing optimal surface water storage on site.
- 1 No. Hydrobrake – The proposed hydrobrake shall restrict the discharge from the site into the existing surface water network.
- 1 No. Petrol Interceptor – The proposed class 1 petrol interceptors shall cleanse the surface water prior to discharging into the existing surface water network.

8 FOUL EFFLUENT

The proposed development will be serviced by 2 separate foul sewer pipes. These separate 150mm uPVC foul sewer pipes will connect into existing foul sewer (225mm dia.) networks identified at the southwest corner and the southeast corner of the site. For further illustrations of the proposed foul network and the connections to the existing foul network please see drawing 24181-B-3021-PL2.

8.1 PROPOSED FOUL SEWER SYSTEM

It is proposed to use a gravity sewer for the new development. A 150mm uPVC foul main between FW MH 5.1 to FW MH 05 & FW MH 04 to FW MH 05 will flow to FW MH 06 where it will connect to an existing FW MH where it will be discharged into an existing 150mm foul sewer. This will serve the east side of the proposed development.

In order to serve the units in the north and west side of the proposed development it is again proposed to use a gravity sewer. A 150mm uPVC foul main between FW MH 01 to FW MH 03 will connect into an existing foul manhole at the southwest corner of the site where it will be discharged into an existing 225mm foul sewer. The new foul sewer system will be constructed within the site in accordance with the following:

- BS EN 752:2008 – Drain & Sewer Systems Outside Buildings,
- Building Regulations - TGD Part H – Drainage and Wastewater Disposal.
- IW Standard Details

8.2 WASTEWATER LOADING RATES

The estimated wastewater discharge rates are summarised for both residential and commercial are shown in Table 8.1 below.

Table 8.1 - Estimated Foul Demand

Residential/Commercial Foul Demand						
Use	No. of Units	Occupancy Rate (persons/dwelling)	Population (P)	Average daily domestic demand (l/day)	Average Flow (l/s)	Peak Flow (l/s)
Residential/ commercial	13	2.7	35.1	5,792	0.067	0.372

The overall daily wastewater loading is 5,792 litres/day or 5.792m^3 day. As mentioned above, the proposed foul sewer system will be connected to the existing foul sewer network to the southwest and southeast of the proposed development. Additionally, it must be noted that a pre-connection application has been submitted to Irish Water for this proposed development, with the corresponding reference number for this application being CDS24008994. Refer to Appendix E for pre-connection enquiry application.

9 Potable Water Supply

9.1 Existing Water Supply

Following the review of the Uisce Eireann ArcGIS Web viewer there is an existing 100mm uPVC watermain situated in the footbath across the road on the east side of the proposed development. This can be seen in figure 9.1 below.

Figure 9.1 - Extract from ArcGIS Usice Eireann web viewer showing existing watermains

9.2 Proposed Water Supply

The proposed development will be connected to the existing public watermain via 100mm dia which runs just outside the eastern boundary of the proposed application site. The water demand is calculated in accordance with Code of Practice for Water Infrastructure, Connections and Developer Services, Design & Construction Requirements for Self-Lay Developments, July 2020 (Revision 2)', Section 3.7.2. The total peak average flow for the combined commercial and residential use will be 0.061 l/s with a peak flow of 0.381l/s.

The proposed connection for the proposed development will be made in accordance with Irish Water Standard Details for Non-Mechanical Meter Chamber (40-250mm diameter): Ref. STD-W-26-Rev 03. Please refer to drawing 24181-B-3022-PL2 for the location and details of the proposed watermains network and fire hydrants proposed for this new site layout. A pre-connection application has been submitted to Uisce Eireann for this proposed development, with the corresponding reference number for this application being CDS24008994.

Table 9.1 - Estimated Water Demand

Residential/Commercial Water Demand						
Use	No. of Units	Occupancy Rate (persons/dwelling)	Population (P)	Average daily domestic demand (l/day)	Average Flow (l/s)	Peak Flow (l/s)
Residential/ commercial	13	2.7	35.1	5,265	0.061	0.381

9.3 Fire Hydrants

It is proposed to use 5 No. fire hydrants on the loop main. Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Irish Waters Code of Practice and Standard Details.

10 SUMMARY AND CONCLUSIONS

SURFACE WATER

The proposed surface water network on site consists of series of roof gutters and downpipes, and Graf EcoBloc Attenuation Tank. These SuDS features are to work in tandem to provide a cumulative surface water storage capacity of circa 200m^3, with a HydroBrake flow control device reducing the outflow from the proposed application site to the equivalent of 6.2l/s. This proposed design achieves compliance with all previously stated regulations whilst considering the constraints of the site.

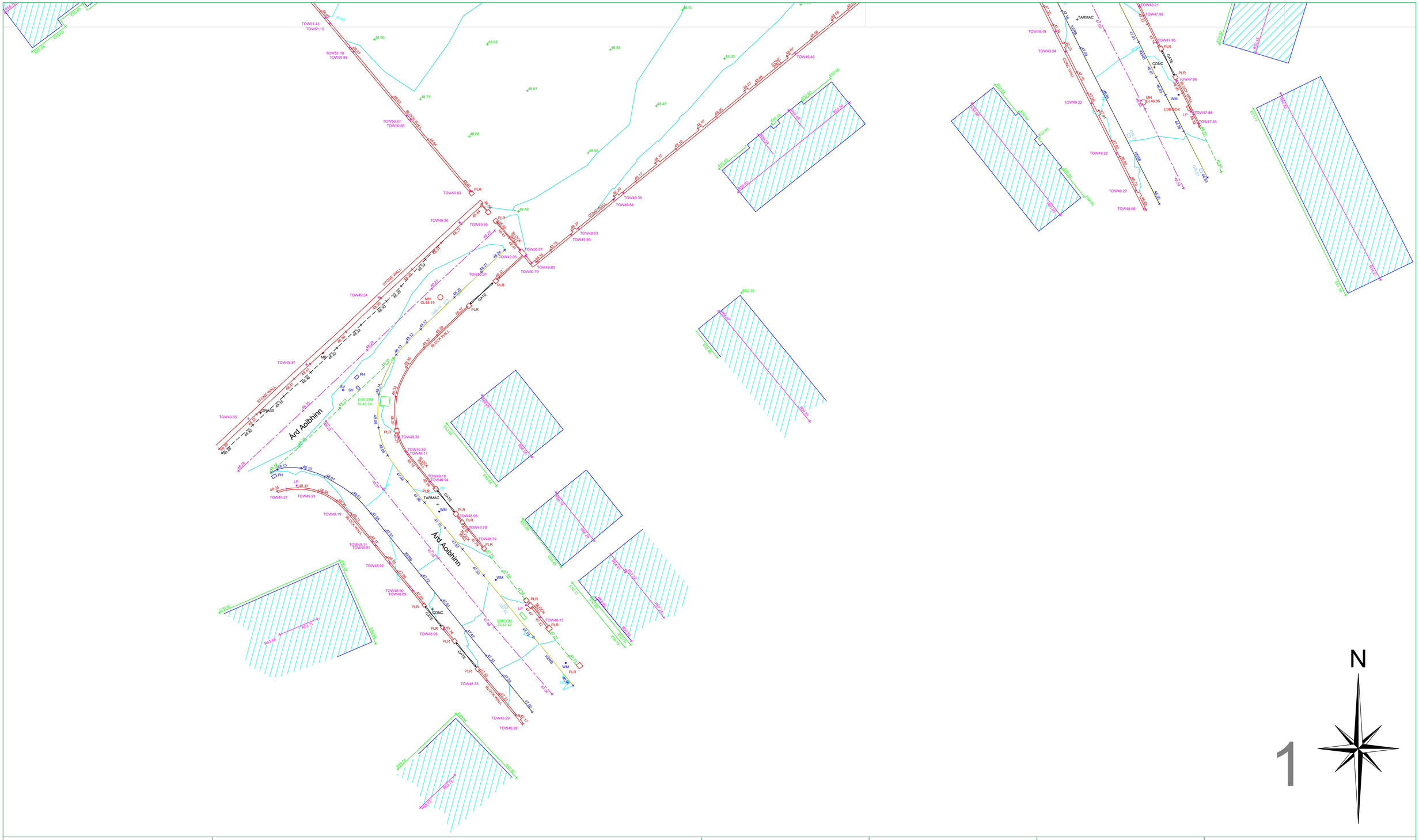
FOUL EFFLUENT

The total wastewater loading from the site will be 5.792m^3/day, with a peak flow of 0.372l/s.

WATERMAINS

The total volume of water required by the proposed development will be circa 5.265m^3/day, with a peak flow of 0.381l/s.

APPENDIX A – TOPGRAPHICAL SURVEY



APEX SURVEYS

www.apexsurveys.ie
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00353 1 691 0156

RURAL/NATURAL FEATURES :

BUSH	○
SAPLING	●
TREE	○
HEDGE	
TROUGH	TR
CATTLE GRID	GRID

LINEWORK:

EMBANKEMENT TOP	101.50
DRAIN	101.50
BREAKLINE	101.50
BUILDING	101.50
KERB BOTTOM	101.50
WALL	101.50
PATH/CHANGE SURFACE	101.50
O/HEAD ELECTRICITY	OE
O/HEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD •
BORE HOLE	BH +
BUS STOP	BS •
CRASH BARRIER	CB
ELECTRICITY POLE	EP •
EARTHING ROD	ER +
GATE	
GROUND LIGHT	LT •
ILLUMINATED BOLLARD	BOL ☐
LAMP POST	LP •
MARKER POST	MKR +
POST	POST •
POST BOX	POST BOX +
ROADSIGN	RS • RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP •
TRAFFIC LIGHT	TL •
TRIAL PIT	TPIT +

SERVICES :

AIR VALVE	AV +
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV ☐
COVER LEVEL	CL
EIRCOM COVER	EIRCOM ☐
EIRCOM JUNCTION BOX	EIRCOM BOX ☐
ELECTRICAL CABLE PIT	ECP ○
ESAT COVER	ESAT ☐
ESB COVER	ESB ☐
ESB JUNCTION BOX	ESB BOX ☐
FIRE HYDRANT	FH •
GAS VALVE	GV ☐
GULLY	G ☐
INSPECTION COVER	IC ☐
MANHOLE	MH
SEPTIC TANK	SEPTIC ☐
SLUICE VALVE	SV •
STOPCOCK	ST •

SERVICES :

SERVICE BOX (UNKNOWN)	BOX ☐
TRAFFIC COVER	TLIC ☐
VENT	VENT •
WATER METER	WM +
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+ BED101.50
EAVE LEVEL	+ E101.50
FLOOR LEVEL	+ FL101.50
INVERT LEVEL	+ IL101.50
ROAD LEVEL	+ 101.50
RIDGE LEVEL	+ R101.50
SOFFIT LEVEL	+ SL101.50
SPOT LEVEL	+ 101.50
TOP OF FENCE LEVEL	+ TOF101.50
TOP OF WALL LEVEL	+ TOW101.50
WATER LEVEL	+ WL101.50
SURVEY CONTROL STATION	⊕

SHEET LAYOUT :

PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

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Dunboyne, Co. Meath, Ireland
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00353 1 691 0156

CLIENT:

SDS
Design Engineers

PROJECT:

Social Housing Development
Cullairbuan Site
Athenry Co. Galway

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

SCALE : 1/200 A1

DATE : 25/10/2024

DRG No: 6682

DESCRIPTION : 2D Topographical

SURVEYED BY : F.K.

PROCESSED BY : T.G.

SHEET: 1 of 4

CHECKED BY : A.B.

APEX SURVEYS

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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	TR
CATTLE GRID	GRID

LINEWORK:

EMBANKEMENT TOP	101.50
DRAIN	101.50
BREAKLINE	101.50
BUILDING	101.50
KERB BOTTOM	101.50
WALL	101.50
PATH/CHANGE SURFACE	101.50
O/HEAD ELECTRICITY	OE
O/HEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD
BORE HOLE	BH +
BUS STOP	BS
CRASH BARRIER	CB
ELECTRICITY POLE	EP
EARTHING ROD	ER +
GATE	
GROUND LIGHT	LT
ILLUMINATED BOLLARD	BOL ☐
LAMP POST	LP
MARKER POST	MKR +
POST	POST
POST BOX	POST BOX +
ROADSIGN	RS · RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRAFFIC LIGHT	TL
TRIAL PIT	TPIT +

SERVICES :

AIR VALVE	AV +
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV ☐
COVER LEVEL	CL
EIRCOM COVER	EIRCOM ☐
EIRCOM JUNCTION BOX	EIRCOM BOX ☐
ELECTRICAL CABLE PIT	ECP ○
ESAT COVER	ESAT ☐
ESB COVER	ESB ☐
ESB JUNCTION BOX	ESB BOX ☐
FIRE HYDRANT	FH
GAS VALVE	GV ☐
GULLY	G ☐
INSPECTION COVER	IC ☐
MANHOLE	MH
SEPTIC TANK	SEPTIC ☐
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX ☐
TRAFFIC COVER	TLIC ☐
VENT	VENT
WATER METER	WM +
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+ BED101.50
EAVE LEVEL	+ E101.50
FLOOR LEVEL	+ FL101.50
INVERT LEVEL	+ IL101.50
ROAD LEVEL	+ 101.50
RIDGE LEVEL	+ R101.50
SOFFIT LEVEL	+ SL101.50
SPOT LEVEL	+ 101.50
TOP OF FENCE LEVEL	+ TOF101.50
TOP OF WALL LEVEL	+ TOW101.50
WATER LEVEL	+ WL101.50
SURVEY CONTROL STATION	

SHEET LAYOUT :

PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

Apex Surveys
Unit 78 Dunboyne Business Park
Dunboyne, Co. Meath, Ireland
www.apexsurveys.ie
info@apexsurveys.ie
00353 1 691 0156

CLIENT:

SDS
Design Engineers

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

Social Housing Development
Cullairbuan Site
Athenry Co. Galway

SCALE : 1/200 A1

DATE : 25/10/2024

DRG No: 6682

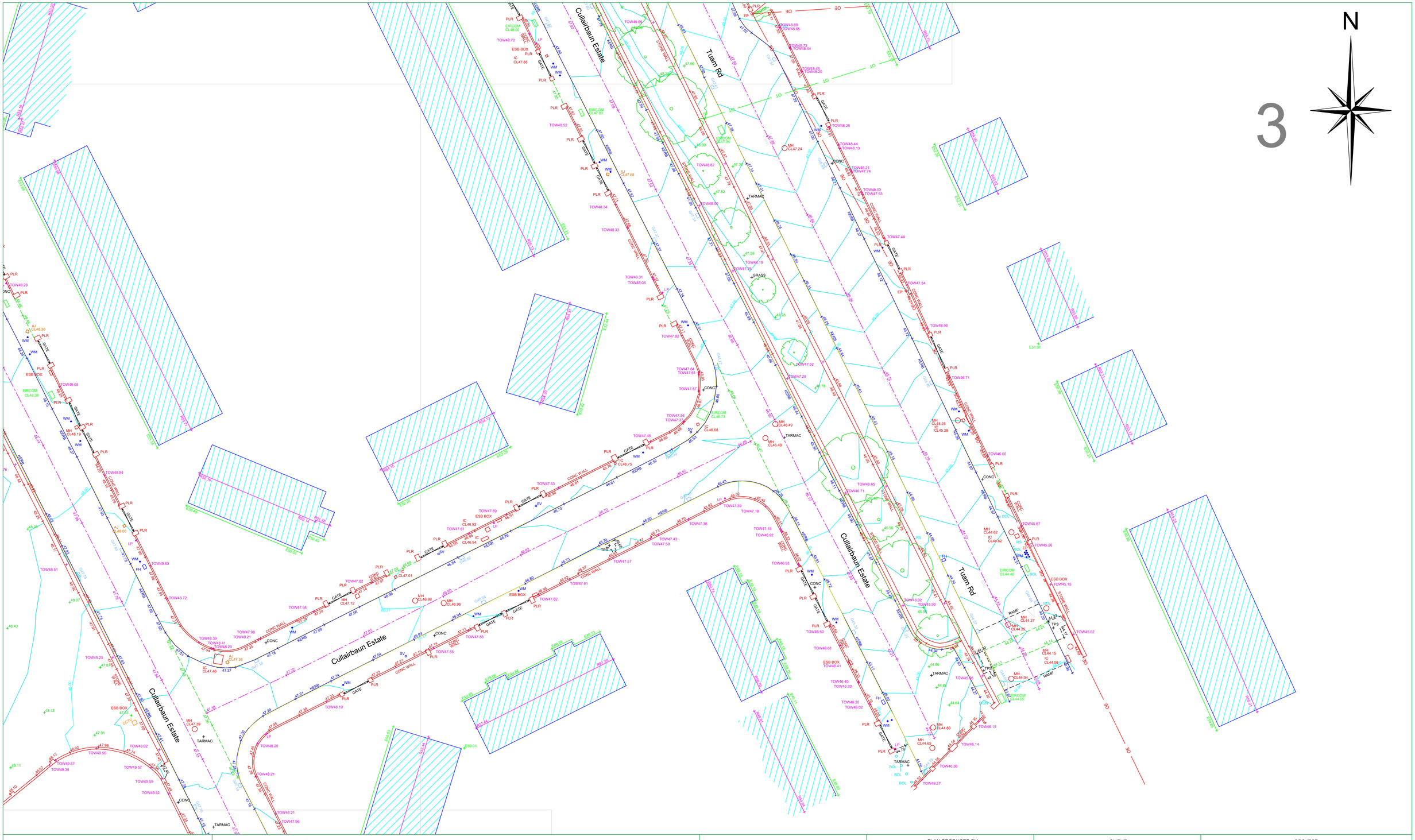
DESCRIPTION : 2D Topographical

SURVEYED BY : F.K.

PROCESSED BY : T.G.

SHEET: 2 of 4

CHECKED BY : A.B.



APEX SURVEYS

www.apexsurveys.ie
info@apexsurveys.ie
00353 1 691 0156

RURAL/NATURAL FEATURES :

BUSH
SAPLING
TREE
HEDGE
TROUGH
CATTLE GRID

LINEWORK:

EMBANKEMENT TOP	101.50
DRAIN	101.50
BREAKLINE	101.50
BUILDING	101.50
KERB BOTTOM	101.50
WALL	101.50
PATH/CHANGE SURFACE	101.50
O/HEAD ELECTRICITY	OE
O/HEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD *
BORE HOLE	BH +
BUS STOP	BS *
CRASH BARRIER	CB
ELECTRICITY POLE	EP *
EARTHING ROD	ER +
GATE	
GROUND LIGHT	LT *
ILLUMINATED BOLLARD	BOL
LAMP POST	LP *
MARKER POST	MKR
POST	POST *
POST BOX	POST BOX +
ROADSIGN	RS * RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP *
TRAFFIC LIGHT	TL *
TRIAL PIT	TPIT +

SERVICES :

AIR VALVE	AV +
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH +
GAS VALVE	GV
GULLY	IC
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV *
STOPCOCK	ST *

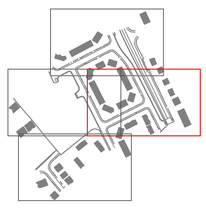
SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT *
WATER METER	WM +
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+ BED101.50
EAVE LEVEL	+ E101.50
FLOOR LEVEL	+ FL101.50
INVERT LEVEL	+ IL101.50
ROAD LEVEL	+ 101.50
RIDGE LEVEL	+ R101.50
SOFFIT LEVEL	+ SL101.50
SPOT LEVEL	+ 101.50
TOP OF FENCE LEVEL	+ TOF101.50
TOP OF WALL LEVEL	+ TOW101.50
WATER LEVEL	+ WL101.50
SURVEY CONTROL STATION	

SHEET LAYOUT :



PLAN PRODUCED BY:

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CONTACT INFORMATION:

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00353 1 691 0156

CLIENT:

SDS
Design Engineers

PROJECT:

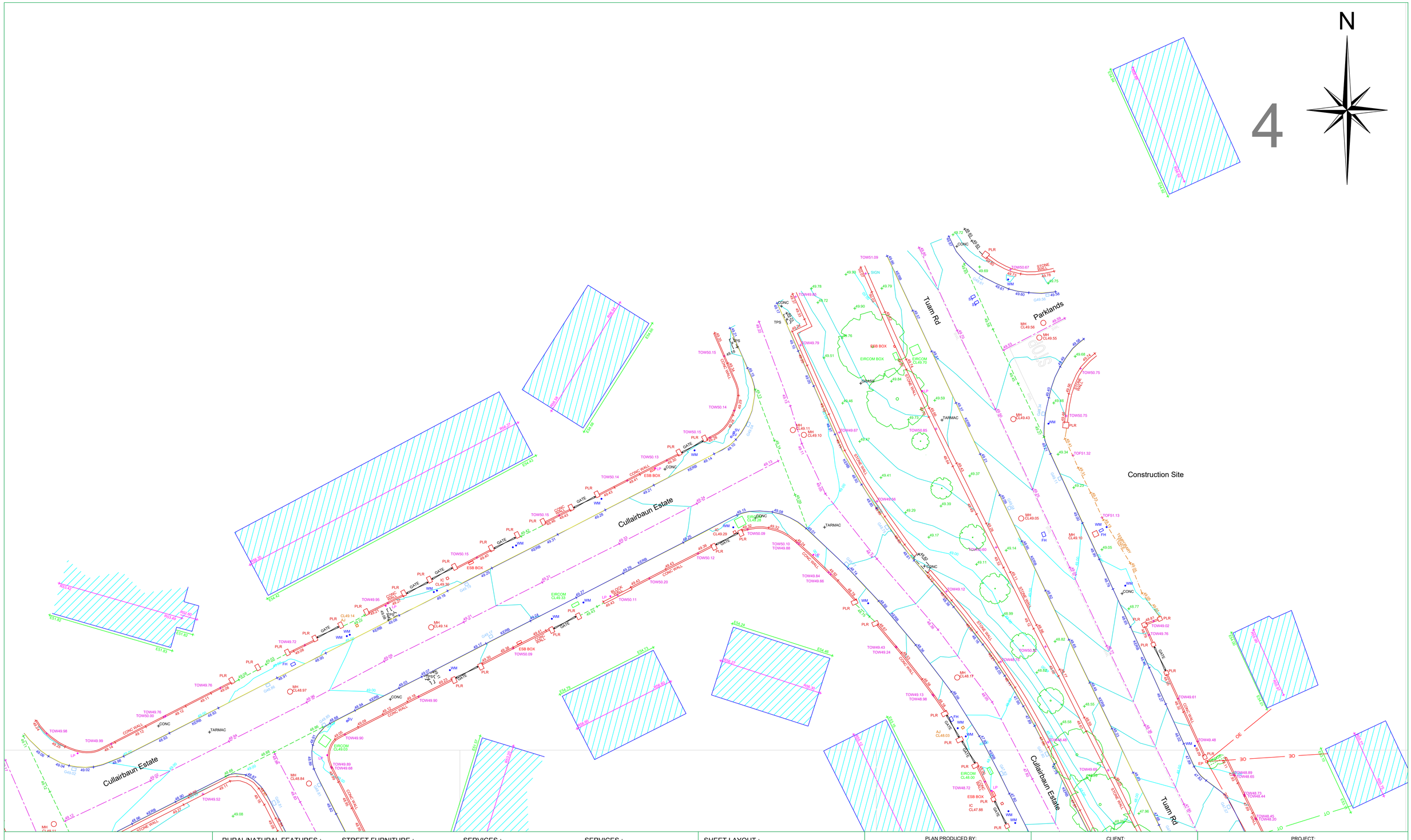
Social Housing Development
Cullairbuan Site
Athenry Co. Galway

GRID SYSTEM:	Irish Transverse Mercator
DATUM:	Malin Head (OSGM15)
NOTES:	Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

SCALE :	1/200 A1	DATE :	25/10/2024
DRG No:	6682	DESCRIPTION :	2D Topographical
		SURVEYED BY :	F.K.
SHEET:	3 of 4	PROCESSED BY :	T.G.
		CHECKED BY :	A.B.



APEX SURVEYS

www.apexsurveys.ie
info@apexsurveys.ie
00353 1 691 0156

RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	TR
CATTLE GRID	GRID

LINEWORK:

EMBANKEMENT TOP	101.50
DRAIN	101.50
BREAKLINE	101.50
BUILDING	101.50
KERB BOTTOM	101.50
WALL	101.50
PATH/CHANGE SURFACE	101.50
O/HEAD ELECTRICITY	OE
O/HEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD •
BORE HOLE	BH +
BUS STOP	BS •
CRASH BARRIER	CB
ELECTRICITY POLE	EP •
EARTHING ROD	ER +
GATE	
GROUND LIGHT	LT •
ILLUMINATED BOLLARD	BOL □
LAMP POST	LP •
MARKER POST	MKR +
POST	POST •
POST BOX	POST BOX +
ROADSIGN	RS • RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP •
TRAFFIC LIGHT	TL •
TRIAL PIT	TPIT +

SERVICES :

AIR VALVE	AV +
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV □
COVER LEVEL	CL
EIRCOM COVER	EIRCOM □
EIRCOM JUNCTION BOX	EIRCOM BOX □
ELECTRICAL CABLE PIT	ECP ○
ESAT COVER	ESAT □
ESB COVER	ESB □
ESB JUNCTION BOX	ESB BOX □
FIRE HYDRANT	FH •
GAS VALVE	GV □
GULLY	G □
INSPECTION COVER	IC □
MANHOLE	MH
SEPTIC TANK	SEPTIC □
SLUICE VALVE	SV •
STOPCOCK	ST •

SERVICES :

SERVICE BOX (UNKNOWN)	BOX □
TRAFFIC COVER	TLIC □
VENT	VENT •
WATER METER	WM +
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+ BED101.50
EAVE LEVEL	+ E101.50
FLOOR LEVEL	+ FL101.50
INVERT LEVEL	+ IL101.50
ROAD LEVEL	+ 101.50
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SPOT LEVEL	+ 101.50
TOP OF FENCE LEVEL	+ TOF101.50
TOP OF WALL LEVEL	+ TOW101.50
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SURVEY CONTROL STATION	

SHEET LAYOUT :

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CLIENT:

SDS
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GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

Social Housing Development
Cullairbuan Site
Athenry Co. Galway

SCALE : 1/200 A1

DATE : 25/10/2024

DESCRIPTION : 2D Topographical

DRG No: 6682

SURVEYED BY : F.K.

PROCESSED BY : T.G.

SHEET: 4 of 4

CHECKED BY : A.B.

APPENDIX B – UISCE EIREANN MAP RECORDS

SM49289403
CL 49.157002
IL 47.987
SM49289301
CL 47.470001
IL 46.235001
SM49289305
CL 500
IL 0
150mm uPVC
100mm uPVC 1975
225mm uPVC
0 Unknown

APPENDIX C – MICRODRAINAGE OUTPUTS

Structual & Civil Engineers Unit 9, N5 Business Park, Cas... Co. Mayo, Mayo, Ireland	Attenuation Tank Check
Date 18/02/2025 17:28 File Attenuation Tank -18.02....	Designed by AT Checked by CD
Innovyze	Source Control 2020.1

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 222 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	47.000	0.335	0.0	6.2	6.2	63.6	O K
30 min Summer	47.127	0.462	0.0	6.2	6.2	87.8	O K
60 min Summer	47.249	0.584	0.0	6.2	6.2	110.9	O K
120 min Summer	47.354	0.689	0.0	6.2	6.2	131.0	O K
180 min Summer	47.398	0.733	0.0	6.2	6.2	139.3	O K
240 min Summer	47.412	0.747	0.0	6.2	6.2	142.0	O K
360 min Summer	47.418	0.753	0.0	6.2	6.2	143.2	O K
480 min Summer	47.411	0.746	0.0	6.2	6.2	141.7	O K
600 min Summer	47.397	0.732	0.0	6.2	6.2	139.0	O K
720 min Summer	47.378	0.713	0.0	6.2	6.2	135.4	O K
960 min Summer	47.329	0.664	0.0	6.2	6.2	126.1	O K
1440 min Summer	47.229	0.564	0.0	6.2	6.2	107.2	O K
2160 min Summer	47.096	0.431	0.0	6.2	6.2	82.0	O K
2880 min Summer	46.991	0.326	0.0	6.2	6.2	62.0	O K
4320 min Summer	46.865	0.200	0.0	5.9	5.9	37.9	O K
5760 min Summer	46.806	0.141	0.0	5.5	5.5	26.8	O K
7200 min Summer	46.785	0.120	0.0	4.9	4.9	22.8	O K
8640 min Summer	46.772	0.107	0.0	4.4	4.4	20.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	89.434	0.0	69.7	27
30 min Summer	62.213	0.0	97.2	40
60 min Summer	40.710	0.0	127.9	68
120 min Summer	25.823	0.0	162.3	126
180 min Summer	19.616	0.0	185.0	184
240 min Summer	16.106	0.0	202.5	226
360 min Summer	12.163	0.0	229.4	288
480 min Summer	9.952	0.0	250.3	354
600 min Summer	8.513	0.0	267.7	424
720 min Summer	7.490	0.0	282.6	494
960 min Summer	6.118	0.0	307.8	626
1440 min Summer	4.599	0.0	347.0	886
2160 min Summer	3.455	0.0	391.6	1260
2880 min Summer	2.818	0.0	425.8	1600
4320 min Summer	2.111	0.0	478.2	2292
5760 min Summer	1.719	0.0	519.6	2952
7200 min Summer	1.465	0.0	553.5	3680
8640 min Summer	1.285	0.0	582.7	4408

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	46.763	0.098	0.0	3.9	3.9	18.6	O K
15 min Winter	47.041	0.376	0.0	6.2	6.2	71.5	O K
30 min Winter	47.187	0.522	0.0	6.2	6.2	99.1	O K
60 min Winter	47.329	0.664	0.0	6.2	6.2	126.2	O K
120 min Winter	47.456	0.791	0.0	6.2	6.2	150.3	O K
180 min Winter	47.507	0.842	0.0	6.2	6.2	160.0	O K
240 min Winter	47.528	0.863	0.0	6.2	6.2	163.9	O K
360 min Winter	47.528	0.863	0.0	6.2	6.2	164.0	O K
480 min Winter	47.517	0.852	0.0	6.2	6.2	161.8	O K
600 min Winter	47.494	0.829	0.0	6.2	6.2	157.6	O K
720 min Winter	47.466	0.801	0.0	6.2	6.2	152.1	O K
960 min Winter	47.395	0.730	0.0	6.2	6.2	138.7	O K
1440 min Winter	47.218	0.553	0.0	6.2	6.2	105.1	O K
2160 min Winter	47.014	0.349	0.0	6.2	6.2	66.4	O K
2880 min Winter	46.886	0.221	0.0	6.0	6.0	42.0	O K
4320 min Winter	46.791	0.126	0.0	5.2	5.2	24.0	O K
5760 min Winter	46.769	0.104	0.0	4.2	4.2	19.8	O K
7200 min Winter	46.757	0.092	0.0	3.6	3.6	17.4	O K
8640 min Winter	46.749	0.084	0.0	3.2	3.2	15.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.151	0.0	608.4	5136
15 min Winter	89.434	0.0	77.9	27
30 min Winter	62.213	0.0	108.7	41
60 min Winter	40.710	0.0	143.2	68
120 min Winter	25.823	0.0	181.8	124
180 min Winter	19.616	0.0	207.2	180
240 min Winter	16.106	0.0	226.9	236
360 min Winter	12.163	0.0	257.0	300
480 min Winter	9.952	0.0	280.4	376
600 min Winter	8.513	0.0	299.8	456
720 min Winter	7.490	0.0	316.6	534
960 min Winter	6.118	0.0	344.8	690
1440 min Winter	4.599	0.0	388.7	948
2160 min Winter	3.455	0.0	438.6	1304
2880 min Winter	2.818	0.0	476.9	1624
4320 min Winter	2.111	0.0	535.7	2232
5760 min Winter	1.719	0.0	582.0	2952
7200 min Winter	1.465	0.0	619.9	3640
8640 min Winter	1.285	0.0	652.7	4392

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	46.743	0.078	0.0	2.9	2.9	14.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.151	0.0	681.5	5088

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.900	Shortest Storm (mins)	15
Ratio R	0.270	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Pipe Network

Volume in Pipe Network (m^3)	10	Dia of Outfall Pipe (m)	0.3
Slope of Outfall Pipe (1:X)	200	Roughness of Outfall Pipe (mm)	0.150

Time Area Diagram

Total Area (ha) 0.420

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.140	4	8	0.140	8	12	0.140

Model Details

Storage is Online Cover Level (m) 48.750

Cellular Storage Structure

Invert Level (m) 46.665 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	200.0	0.0	1.001	0.6	0.0
1.000	200.0	0.0	2.085	0.6	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0115-6200-1100-6200
Design Head (m)	1.100
Design Flow (l/s)	6.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	115
Invert Level (m)	46.665
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	6.2	Kick-Flo®	0.704	5.0
Flush-Flo™	0.327	6.2	Mean Flow over Head Range	-	5.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	1.200	6.4	3.000	9.9	7.000	14.8
0.200	5.9	1.400	6.9	3.500	10.7	7.500	15.3
0.300	6.2	1.600	7.4	4.000	11.4	8.000	15.8
0.400	6.2	1.800	7.8	4.500	12.0	8.500	16.3
0.500	6.0	2.000	8.2	5.000	12.6	9.000	16.7
0.600	5.7	2.200	8.6	5.500	13.2	9.500	17.2
0.800	5.3	2.400	8.9	6.000	13.8		
1.000	5.9	2.600	9.3	6.500	14.3		

APPENDIX D – MET ÉIREANN RAINFALL RETURN PERIOD DATA

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 149917, Northing: 228448,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.7,	3.7,	4.2,	5.1,	5.6,	6.0,	7.4,	9.0,	10.0,	11.4,	12.7,	13.7,	15.2,	16.3,	17.3,	N/A ,
10 mins	3.7,	5.1,	5.9,	7.0,	7.8,	8.4,	10.3,	12.5,	13.9,	15.9,	17.7,	19.1,	21.1,	22.8,	24.1,	N/A ,
15 mins	4.4,	6.0,	6.9,	8.3,	9.2,	9.9,	12.2,	14.7,	16.4,	18.7,	20.8,	22.4,	24.9,	26.8,	28.4,	N/A ,
30 mins	5.8,	7.9,	9.0,	10.6,	11.7,	12.5,	15.2,	18.2,	20.1,	22.8,	25.2,	27.0,	29.8,	31.9,	33.7,	N/A ,
1 hours	7.8,	10.3,	11.7,	13.6,	14.9,	15.9,	19.1,	22.5,	24.8,	27.8,	30.5,	32.6,	35.7,	38.0,	40.0,	N/A ,
2 hours	10.4,	13.5,	15.1,	17.5,	19.0,	20.2,	23.9,	27.9,	30.4,	33.9,	36.9,	39.2,	42.7,	45.4,	47.5,	N/A ,
3 hours	12.3,	15.8,	17.6,	20.2,	21.9,	23.2,	27.2,	31.6,	34.3,	38.1,	41.3,	43.8,	47.5,	50.3,	52.5,	N/A ,
4 hours	13.8,	17.7,	19.6,	22.4,	24.2,	25.6,	29.9,	34.5,	37.4,	41.3,	44.7,	47.3,	51.1,	54.1,	56.4,	N/A ,
6 hours	16.4,	20.7,	22.9,	25.9,	27.9,	29.4,	34.1,	39.1,	42.2,	46.4,	50.0,	52.8,	56.8,	59.9,	62.4,	N/A ,
9 hours	19.4,	24.2,	26.6,	30.0,	32.2,	33.8,	38.9,	44.2,	47.6,	52.1,	56.0,	58.8,	63.1,	66.4,	69.0,	N/A ,
12 hours	21.9,	27.1,	29.6,	33.3,	35.6,	37.3,	42.7,	48.3,	51.9,	56.6,	60.6,	63.6,	68.0,	71.4,	74.1,	N/A ,
18 hours	25.9,	31.7,	34.5,	38.5,	41.0,	42.9,	48.7,	54.8,	58.5,	63.5,	67.8,	70.9,	75.6,	79.1,	81.9,	N/A ,
24 hours	29.2,	35.4,	38.4,	42.7,	45.3,	47.3,	53.5,	59.8,	63.7,	69.0,	73.4,	76.6,	81.5,	85.1,	88.0,	97.7,
2 days	37.9,	45.3,	48.8,	53.6,	56.7,	58.9,	65.9,	73.0,	77.3,	83.1,	87.9,	91.4,	96.7,	100.6,	103.8,	114.1,
3 days	45.4,	53.6,	57.5,	62.9,	66.3,	68.8,	76.4,	84.2,	88.9,	95.1,	100.3,	104.2,	109.8,	114.0,	117.3,	128.4,
4 days	52.2,	61.2,	65.5,	71.4,	75.0,	77.7,	85.9,	94.3,	99.3,	106.0,	111.5,	115.6,	121.6,	126.0,	129.6,	141.2,
6 days	64.6,	75.0,	79.9,	86.6,	90.8,	93.9,	103.1,	112.5,	118.1,	125.5,	131.7,	136.2,	142.8,	147.7,	151.6,	164.3,
8 days	76.1,	87.8,	93.2,	100.6,	105.2,	108.6,	118.8,	129.0,	135.2,	143.2,	149.9,	154.8,	162.0,	167.2,	171.4,	185.1,
10 days	87.0,	99.7,	105.7,	113.8,	118.8,	122.4,	133.5,	144.5,	151.1,	159.8,	166.9,	172.2,	179.8,	185.4,	189.9,	204.4,
12 days	97.5,	111.2,	117.6,	126.3,	131.7,	135.7,	147.4,	159.2,	166.3,	175.5,	183.1,	188.6,	196.7,	202.6,	207.4,	222.7,
16 days	117.5,	133.2,	140.5,	150.3,	156.3,	160.7,	173.9,	187.0,	194.9,	205.1,	213.5,	219.6,	228.5,	235.0,	240.2,	257.0,
20 days	136.8,	154.3,	162.3,	173.1,	179.7,	184.6,	199.1,	213.4,	221.9,	233.0,	242.1,	248.8,	258.4,	265.5,	271.1,	289.2,
25 days	160.3,	179.7,	188.6,	200.6,	207.9,	213.3,	229.2,	244.9,	254.3,	266.4,	276.3,	283.5,	294.0,	301.7,	307.7,	327.3,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

APPENDIX E – UISCE EIREANN PRE-CONNECTION ENQUIRY

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 note that this is a digital PDF form and can be filled in electronically

Please refer to the **Guide to completing the pre-connection enquiry form** on page 14 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):

Trading name (if applicable):

Company registration number (if applicable):

Parent company registered company name (if applicable):

Parent company registration number (if applicable):

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

GALWAY COUNTY COUNCIL

*Contact name: ALAN BROGAN

*Postal address: ARAS AN CHONTAE,

PROSPECT HILL

GALWAY

*Eircode: H91H6KX

Please provide either a landline or a mobile number

Landline: 0915093 20

*Mobile:

*Email: abrogan@galwaycoco.ie

2 Agent details (if applicable):

The fields marked with * in this section are mandatory if using an agent

*Contact name: CONNOR DALY

Company name (if applicable): SDS

*Postal address: UNIT 9, N5 BUSINESS PARK,
CASTLEBAR, CO. MAYO

*Eircode: F23E283

Please provide either a landline or a mobile number

Landline: 0949034914

*Mobile 0876459256

*Email: cdaly@structuraldesign.ie

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

Applicant [●] Agent [ ]

Section B | Site details

4 *Site address 1 (include Site name/Building name/Building number):

CULLAIRBAUN

***Address 2**

***Address 3**

***City/Town** ATHENRY

***County** Co. GALWAY **Eircode**

5 *Irish Grid co-ordinates (proposed connection point):

Eastings (X) 149917 Northings (Y) 228448

Note: Values for Eastings must be between 015,900 and 340,000. Northings, between 029,000 and 362,000
Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 *Local Authority where proposed development is located:

GALWAY COUNTY COUNCIL

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

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

8 ***Is this development affiliated with a government body/agency?** Yes ☐ No ☑

If 'Yes', please specify the body/agency:

Eg. IDA, HSE, LDA, etc.

Section C | Development details

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

Domestic:

Property type	Number of units	Property type	Number of units
House	13	Apartments	
Duplex		Number of Apartment Blocks	

Industry/business:

Property type	Number of units	Property type	Number of units
Agricultural		Brewery / Distillery	
Restaurant / Café / Pub		Car Wash / Valeting	
Creche		Data Centre	
Fire Hydrant		Fire Station	
Food Processing		Hotel Accommodation	
Industrial / Manufacturing		Laundry / Laundrette	
Office		Primary Care Centre	
Residential / Nursing Care Home		Retail	
School		Sports Facility	
Student Accommodation		Warehouse	

Other (please specify type)		No. of Units	

9.1 Please provide additional details if your proposed business use are in the Food Processing, Industrial unit/ Manufacturing, Sports Facility or Other Categories.

9.2 Please provide the maximum expected occupancy in number of people, according to the proposed development you selected, e.g. Number of office workers, number of nursing home residents, maximum pub occupancy, number of hotel beds, number of retail workers:

10 ***Approximate start date of proposed development:**

0	1	/	1	2	/	2	0	2	4

11 ***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.

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

Both Water and Wastewater ● Please complete both Sections D and E

Water only ☐ Please go to Section D

Wastewater only ☐ Please go to Section E

Reason for only applying for one service (if applicable):

Section D | Water connection and demand details

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

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

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

14 **Approximate date water connection is required:** 0 1 / 1 2 / 2 0 2 4

15 ***What diameter of water connection is required to service the development?** 1 0 0 mm

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

If 'Yes', how many? ☐☐

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

Post-development peak hour water demand		**l/s**
Post-development average hour water demand		**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 **Please indicate the industrial water demand (industry-specific water requirements):**

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

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

4 9 . 1 0 m

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

5 1 . 0 0 m

21 **Is on-site water storage being provided?** Yes ☑ No ☐

Please include calculations on the attached sheet provided.

22 **Are there fire flow requirements?** Yes ☐ No ☑

Additional fire flow requirements over and above those identified in Q17-18		**l/s**

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

23 **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 15 of this document for further details):

Section E | Wastewater connection and discharge details

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

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

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

25 ***Approximate date that wastewater connection is required:** 0 1 / 1 2 / 2 0 2 4

26 ***What diameter of wastewater connection is required to service the development?** 2 2 5 mm

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

If 'Yes', how many? ☐☐

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

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

Please include calculations on the attached sheet provided.

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

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

Please include calculations on the attached sheet provided.

30 Wastewater organic load:

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

Temperature range	
pH range	

31 *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.

Please submit detailed calculations on discharge volumes, peak flows and attenuation volumes with this application

32 *Do you propose to pump the wastewater? Yes ☐ No ☑

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

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

49.10 m

34 What is the lowest finished floor level on site above Malin Head Ordnance Datum? 49.80 m

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

47.59 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: ☑

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). ☑

> 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. ☑

> 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. ☑

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: _____ Date: 16 / 10 / 2024

Your full name (in BLOCK CAPITALS):

C	O	N	N	O	R		D	A	L	Y																				

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

Reference: 'Code of Practice for Water Infrastructure, Connections and Developer Services, Design & Construction Requirements for Self-Lay Developments, July 2020 (Revision 2)',

Section 3.7.2 Water Demand Calculations

Per-capita Consumption = 150l/person/day

Average occupancy ratio of 2.7 persons/dwelling.

13 No. dwellings

Average Daily Domestic Demand (ADDD) = 13 * 2.7 * 150 = 5,265 l/day

Average Hour Water Demand (AHWD) =5,265 * (1day/24hrs) * (1hr/3600s) = 0.061 l/s

Average Day/Peak Week Demand = 1.25 * ADDD or 1.25 * AHWD

Peak Demand = 5.0 * AD/PWD

Peak Hour Water Demand = 5 * 1.25 * AHWD = 5 * 1.25 * 0.061 l/s = 0.381 l/s

On-site storage

Each dwelling will have an attic storage tank capable of providing storage for 24 hours of maximum consumption. As per IW-CDS-5020-03 (Revision 2-2020), the following minimum cold water storage volumes, for new developments using low flush and dual flush WC's, will be provided:

Dwelling house or Apt. (up to 3 Bed without power shower) = 227 litres

Dwelling house or Apt. (4 Bedrooms or single power shower) = 340 litres

Dwelling house or Apt. (having 2 full bathrooms) = 682 litres

Additional water storage per shower en-suite in the above = 90 litres.

Fire flow requirements

Reference: 'Code of Practice for Wastewater Infrastructure, Connections and Developer Services, Design & Construction Requirements for Self-Lay Developments, December 2020 (Revision 2)',

Appendix B Gravity Sewer Design Requirements

Section 2.2 Wastewater Flows - New Networks

Dry Weather Flow = PG + I + E

P=Population = 13 Units * 2.7 persons/unit = 35.1 Persons (Ref Section 2.2)

G=Water Consumption/Capita = 150 l/person/day (Ref Section 2.2)

I = Infiltration = 10% of G = 15 l/person/day

E=0

Dry Weather Flow = 35.1 persons * 150 l/person/day + 35.1 * 15 l/person/day = 5,792 l/day

Design Flow = PfDom * PG + I

PfDom = 6 (Population < 750) See Table (Ref Section 2.2.5)

Design Flow = 6 * 35.1 * 150 + 35.1 * 15 = 32,117 l/day

Average Discharge = 5,792 l/day * (1day/24hrs) * (1hr/3600s) = 0.067 l/s

Peak Discharge = 32,117 l/day * (1day/24hrs) * (1hr/3600s) = 0.372 l/s

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.

Question 8: Please indicate if this development is affiliated with a government body/agency, and if so, specify

Section C | Development details

Question 9: Please specify the number of different property/premises types by filling in the tables provided.

Question 9.1: Please provide additional details if your proposed business use are in the Food Processing, Industrial unit/ Manufacturing, Sports Facility or Other Categories.

Question 9.2: Please indicate the maximum expected occupancy in numbers of people according to the proposed development you selected.

Question 10: Please indicate the approximate commencement date of works on the development.

Question 11: 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 12: 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 13: Please indicate if a water connection already exists for this site.

Question 13.1: Please indicate if this enquiry concerns an additional connection to one already installed on the site.

Question 13.2: 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 14: Please indicate the approximate date that the proposed connection to the water infrastructure will be required.

Question 15: Please indicate what diameter of water connection is required to service this development.

Question 16: 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 17: 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 18: 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 19: 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 20: 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 21: 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 22: 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 23: 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 24: Please indicate if a wastewater connection to a public sewer already exists for this site.

Question 24.1: Please indicate if this enquiry relates to an additional wastewater connection to one already installed.

Question 24.2: 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 25: Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.

Question 26: Please indicate what diameter of wastewater connection is required to service this development.

Question 27: Please indicate if more than one connection is required to service this development. Please indicate number required.

Question 28: 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 29: 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 30: 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 31: 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 32: Please specify if the development needs to pump its wastewater discharge to gain access to Irish Water infrastructure.

Question 33: 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 34: 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 35: 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