



PROPOSED HOUSING DEVELOPMENT AT GORT MHAOILIR, ATHENRY, CO. GALWAY

SERVICES DESIGN REPORT

CLIENT. GALWAY COUNTY COUNCIL

PROJECT NO. 24181-A

DOCUMENT NO. 24181-A-SDS-XX-RP-C-0001-01

DATE APRIL 2025

REV. 01

DOCUMENT TITLE SHEET

Client: Galway County Council, Aras An Chontae, Galway, Co. Galway, H91 H6KX.

Project

Description: The proposed development at Gort Mhaolir, Athenry Co. Galway. The construction of 43no. units (comprising; 14no 2-Bedroom 4-Person Units; 11no 3-Bed 5-Person Units; 4no 3-Bed 4-Person Units; 1no 3-Bed 6-Person Unit; 1no 5-Bed 9-Person Units; 6no 2-Bed 1 Person duplex units and 6no 1-Bed 2 Person duplex units) and connection to existing services together with all ancillary site development works.

Project. No. 24181-A

DISCLAIMER

This Document is Copyright of (Structural Design Solutions) Ltd., Consulting Structural & Civil Engineers. This document and its contents have been prepared for the sole use of our named client and no liability is accepted by SDS (Structural Design Solutions) Ltd., Consulting Structural & Civil Engineers for the use of this report, or its contents for any other use than for which it was prepared.

Copyright: © SDS (Structural Design Solutions) Ltd., Consulting Structural & Civil Engineers 2025.

DOCUMENT CONTROL SHEET

PROJECT No:	24181-A				
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	Services Design Report			
01	18/04/2025		PREPARED	CHECKED	ISSUED
		INITIALS:	MW	CD	CD
		DATE:	18/04/2025	18/04/2025	18/04/2025
			PREPARED	CHECKED	ISSUED
		INITIALS:			
		DATE:			
			PREPARED	CHECKED	ISSUED
		INITIALS:			
		DATE:			
			PREPARED	CHECKED	ISSUED
		INITIALS:			
		DATE:			
			PREPARED	CHECKED	ISSUED
		INITIALS:			
		DATE:			
			PREPARED	CHECKED	ISSUED
		INITIALS:			
		DATE:			

SDS - CIVIL, BUILDING & STRUCTURAL ENGINEERS

Head Office: Unit 9, N5 Business Park, Castlebar, Co. Mayo, F23 E283

Dublin: Silverdale, Old Swords Road, Santry, Dublin 9 D09 CA24.

London: Bridge House, 25-27 The Bridge, Wealdstone, Harrow, HA3 5AB.

—Spain: Calle Virgen de Guadalupe, 44. Úbeda, 23400, Jaén. España.

Email: info@structuraldesign.ie

Tel: +353 (0)94 9034914

Tel: +353 (0)1 6877480

Tel: +44 (0)20 30266724

Tel: +34 662556212

Web: <https://www.structuraldesign.ie/>

TABLE OF CONTENTS

1	INSTRUCTION.....	1
2	PROJECT DETAILS	1
3	SITE LOCATION, SITE DESCRIPTION	1
4	BACKGROUND SURVEYS	2
4.1.1	Site Topography	2
4.1.2	GROUND CONDITIONS.....	3
5	FLOOD RISK.....	3
5.1	Historic Flooding	4
5.2	Flood Maps	4
5.3	Mitigating Risks.....	5
6	LOCAL AUTHORITY	5
7	SURFACE WATER STRAGETY	5
7.1	HIERARCHY OF DISPOSAL.....	5
7.2	COMPLINACE WITH SuDS PRINCIPLES.....	7
7.2.1	Compliance with C573 SuDS Manual.....	7
7.2.2	SuDS Management Train	7
7.3	SUSTAINABLE URBAN DRAINAGE SYSTEMS	8
7.3.1	RAINWATER HARVESTING	8
7.3.2	GREEN ROOFS	8
7.3.3	SOAKAWAYS	8
7.3.4	SWALES.....	8
7.3.5	TREE PITS	8
7.3.6	PERVIOUS PAVEMENTS.....	8
7.3.7	GEO-CELLULAR / MODULAR SYSTEMS.....	9
7.3.8	PONDS / RAIN GARDENS / INFILTRATION BASINS	9
7.3.9	EXISTING SURFACE WATER.....	9
7.4	PROPOSED SURFACE WATER COLLECTION SYSTEM.....	9
7.4.1	OUTFLOW FROM SITE.....	9
7.4.2	SURFACE WATER ATTENUATION SYSTEM	10
8	FOUL EFFLUENT	10

SDS - CIVIL, BUILDING & STRUCTURAL ENGINEERS

Head Office: Unit 9, N5 Business Park, Castlebar, Co. Mayo, F23 E283

Dublin: Silverdale, Old Swords Road, Santry, Dublin 9 D09 CA24.

London: Bridge House, 25-27 The Bridge, Wealdstone, Harrow, HA3 5AB.

Spain: Calle Virgen de Guadalupe,44. Úbeda, 23400, Jaén. España.

Email: info@structuraldesign.ie

Tel: +353 (0)94 9034914

Tel: +353 (0)1 6877480

Tel: +44 (0)20 30266724

Tel: +34 662556212

Web:

8.1	PROPOSED FOUL SEWER SYSTEM.....	10
8.2	WASTEWATER LOADING RATES	10
9	Potable Water Supply	11
9.1	Existing Water Supply.....	11
9.2	Proposed Water Supply	11
9.3	Fire Hydrants.....	12
10	SUMMARY AND CONCLUSIONS	12
	APPENDIX A – TOPGRAPHICAL SURVEY.....	13
	APPENDIX B – SITE INVESTIGATION REPORT	14
	APPENDIX C – MICRODRAINAGE OUTPUTS.....	15
	APPENDIX D – MET ÉIREANN RAINFALL RETURN PERIOD DATA.....	16
	APPENDIX E – UISCE EIREANN PRE-CONNECTION ENQUIRY.....	17

SDS - CIVIL, BUILDING & STRUCTURAL ENGINEERS

Head Office: Unit 9, N5 Business Park, Castlebar, Co. Mayo, F23 E283

Dublin: Silverdale, Old Swords Road, Santry, Dublin 9 D09 CA24.

London: Bridge House, 25-27 The Bridge, Wealdstone, Harrow, HA3 5AB.

Spain: Calle Virgen de Guadalupe, 44. Úbeda, 23400, Jaén. España.

Email: info@structuraldesign.ie

Tel: +353 (0)94 9034914

Tel: +353 (0)1 6877480

Tel: +44 (0)20 30266724

Tel: +34 662556212

Web:

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, Gort Mhaoilir, Athenry Co. Galway.

2 PROJECT DETAILS

The proposed development at Gort Mhaoilir, Athenry, Co. Galway comprises of the development of residential dwellings

The proposed development comprises of the following:

- Formation of three new development entrances
- The construction of 43no. units (comprising; 14no 2-Bedroom 4-Person Units; 11no 3-Bed 5-Person Units; 4no 3-Bed 4-Person Units; 1no 3-Bed 6-Person Unit; 1no 5-Bed 9-Person Units; 6no 2-Bed 1 Person duplex units and 6no 1-Bed 2 Person duplex units)
- 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 Raheen in Athenry Co. Galway. (Figure 3.1). the site is located on the northeast edge of the current Gort Mhaoilir housing estate, next to the Gort Mhaoilir Road, on the southwest edge of the Gort na Ri estate, next to the L3105(Raheen Road) and on the east edge of the Athenry Primary Care Facility. The site has an area of approximately 1.8 hectares (18,435.39m² | 4.55 acres). This application includes all the required drawings for the drainage and Sustainable urban Drainage Design Systems (SuDS), foul, and watermain works.

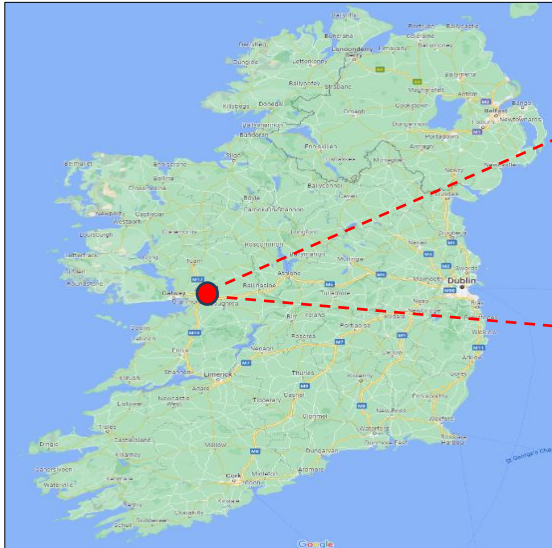


Figure 3.1 - Site Location (image courtesy of Google Maps)



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



Figure 3.3 – Aerial 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 1:81. 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 ascertain the existing ground conditions a site investigation was carried out by Site Investigations Ireland Ltd on the November 2024. The site investigation includes the following elements:

- 7 No. Trial Pits
- 6 No. Boreholes
- 5 No. Plate Tests
- 5 No. Soakaway Tests
- 1 No. Silt Trench

Figure 4.1 below shows the extend of the site investigation. Soil stratification was determined from TP02, TP04, TP05, TP06, & TP07 topsoil overlying grey slightly sandy gravelly silty CLAY. Made ground was identified at TP01 & TP03. Infiltration testing was carried out in accordance 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 existing site is underlain by limestone. Refer to Appendix B for Site Investigations Ireland site investigation report.

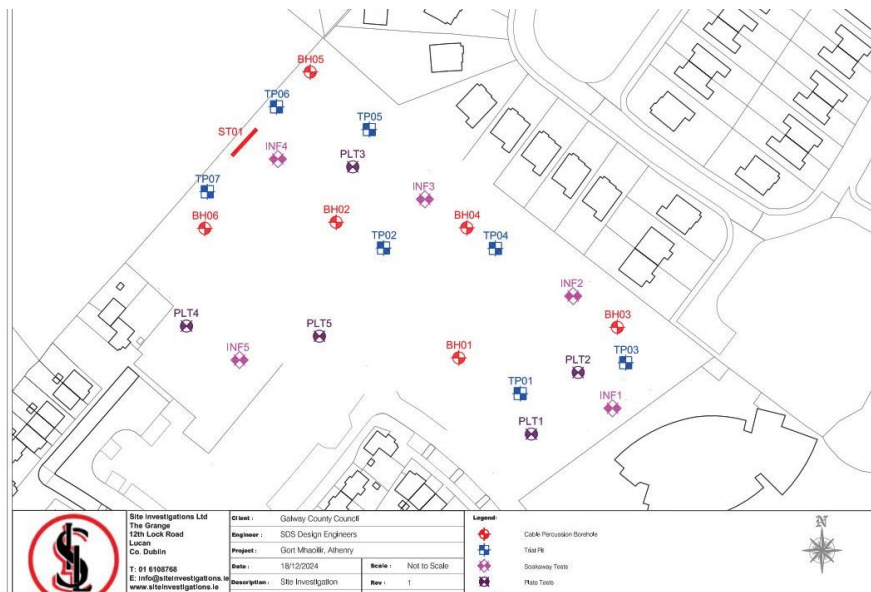


Figure 4.1 Site investigation locations (Source: Site Investigations Ireland LTD)

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.

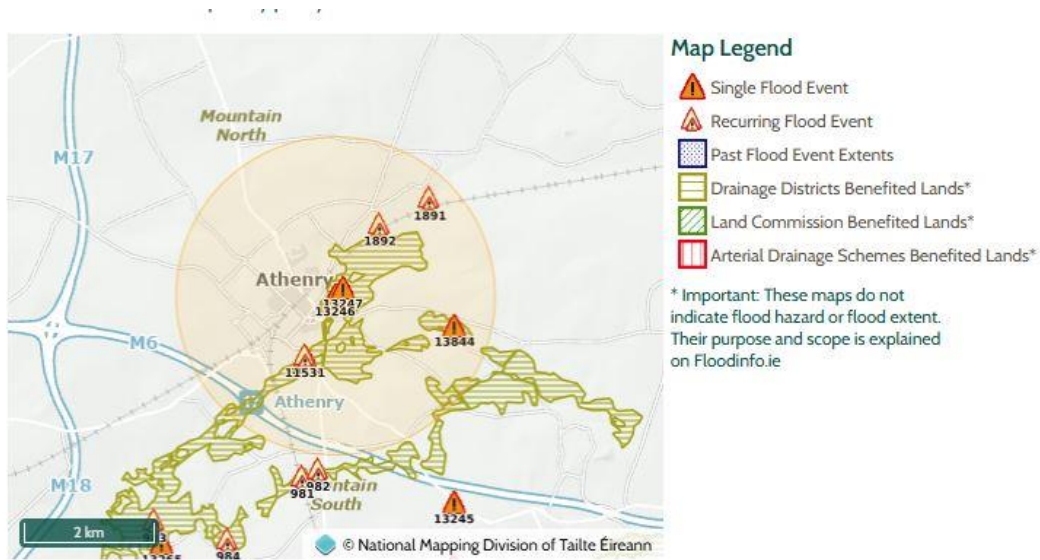


Figure 5.1 – Past flood events within 2.0Km of proposed site (Source: www.floodinfo.ie)

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 9.0/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 STRATEGY

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/policies:

- 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 5 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 Gort Mhaoilir estate road at the southwest 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	Interception¹	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 452m³ 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 southwest of the proposed development. Refer to Appendix A for Topo Survey. 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 SW06 where it will pass through a klargester NSBE020 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 08 which will restrict the outflow from the site, limiting the surface water flow from the site to a discharge of 9.0 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 08 to limit the outflow as outlined above. Refer to drawing no drawing 24181-A-3023-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. 452m³. This has been designed to provide storage for the surface water generated in a 1 in 100-year rainfall event, plus an allowance of 30% to cater for predicted climate change as per GDSDS requirements. For calculations regarding surface water attenuation system design, please see Appendix C. 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 & 225mm uPVC foul sewer pipes will connect into existing foul sewer (225mm dia.) networks identified at the south corner of the site. For further illustrations of the proposed foul network and the connections to the existing foul network please see drawing 24181-A-3022-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 01 will flow to FW MH 02 where it will be discharged into an existing 225mm foul sewer. This will serve the southeast side of the proposed development. A separate 225mm foul will service the east of the site where it will discharge into FW MH 05 and from here discharge into an existing FW MH. The north of the site will also be serviced by a 225mm pipe and will also discharge into the same existing FW MH. 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	43	2.7	116.1	17,415	0.201	1.26

The overall daily wastewater loading is 17,415 litres/day or 17.415m³ day. As mentioned above, the proposed foul sewer system will be connected to the existing foul sewer network to the south 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 CDS24009066. Refer to Appendix E for pre-connection enquiry application.

9 Potable Water Supply

9.1 Existing Water Supply

Following the review of the Topo survey completed by Apex surveys there is an existing 100mm uPVC watermain situated in the footpath across the road on the south side of the of the proposed development. This can be seen in Appendix A.

9.2 Proposed Water Supply

The proposed development will be connected to the existing public watermain via 100mm dia which runs along the southern 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 residential use will be 0.222 l/s with a peak flow of 1.23l/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-A-3024-PL2 for the location and details of the proposed watermain 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 CDS24009066.

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	43	2.7	116.1	19,155	0.222	1.23

9.3 Fire Hydrants

It is proposed to use 13 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 452m³, with a HydroBrake flow control device reducing the outflow from the proposed application site to the equivalent of 9.0l/s. This proposed design achieves compliance with all previously stated regulations whilst considering the constraints of the site.

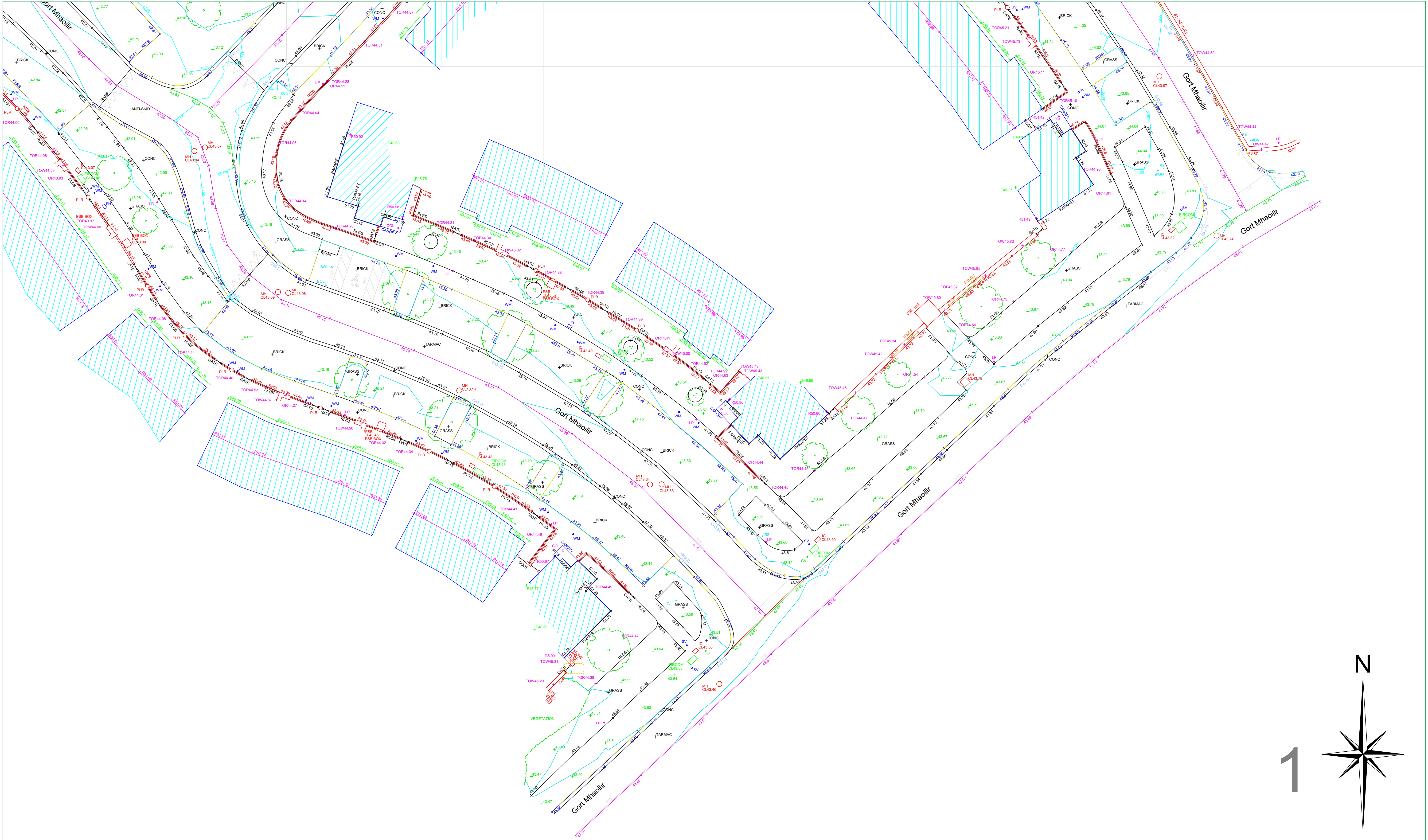
FOUL EFFLUENT

The total wastewater loading from the site will be 17.415m³/day, with a peak flow of 1.26 l/s.

WATERMAINS

The total volume of water required by the proposed development will be circa 19.155m³/day, with a peak flow of 1.23 l/s.

APPENDIX A – TOPGRAPHICAL SURVEY



APEX
SURVEYS

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

RURAL/NATURAL FEATURES :

- BUSH
SAPLING
TREE
HEDGE
TROUGH
CATTLE GRID
LINEWORK:
EMBANKMENT TOP
DRAIN
BREAKLINE
BUILDING
KERB BOTTOM
WALL
PATH/CHANGE SURFACE
OHEAD ELECTRICITY
OHEAD TELECOM

STREET FURNITURE :

- BOLLARDS
BORE HOLE
BUS STOP
CRASH BARRIER
ELECTRICITY POLE
EARTHING ROD
GATE
GROUND LIGHT
ILLUMINATED BOLLARD
LAMP POST
MARKER POST
POST
POST BOX
ROADSIGN
SIGN POST
TELEPHONE BOX
TELEPHONE POLE
TRAFFIC LIGHT
TRIAL PIT

SERVICES :

- AIR VALVE
ARMSTRONG JUNCTION
CABLE TV IC
COVER LEVEL
EIRCOM COVER
EIRCOM JUNCTION BOX
ELECTRICAL CABLE PIT
ESAT COVER
ESB COVER
ESB JUNCTION BOX
FIRE HYDRANT
GAS VALVE
GULLY
INSPECTION COVER
MANHOLE
SEPTIC TANK
SLUICE VALVE
STOPCOCK

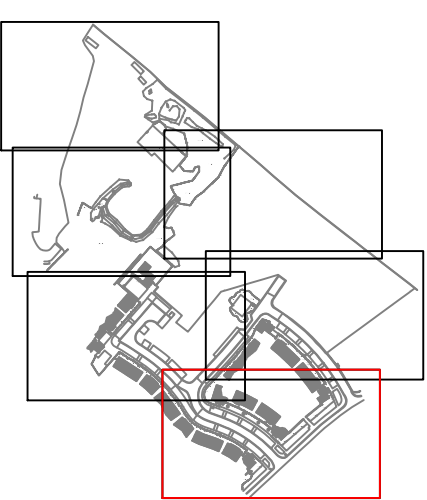
SERVICES :

- AIR VALVE
ARMSTRONG JUNCTION
CABLE TV IC
COVER LEVEL
EIRCOM COVER
EIRCOM JUNCTION BOX
ELECTRICAL CABLE PIT
ESAT COVER
ESB COVER
ESB JUNCTION BOX
FIRE HYDRANT
GAS VALVE
GULLY
INSPECTION COVER
MANHOLE
SEPTIC TANK
SLUICE VALVE
STOPCOCK

SERVICES :

- AIR VALVE
ARMSTRONG JUNCTION
CABLE TV IC
COVER LEVEL
EIRCOM COVER
EIRCOM JUNCTION BOX
ELECTRICAL CABLE PIT
ESAT COVER
ESB COVER
ESB JUNCTION BOX
FIRE HYDRANT
GAS VALVE
GULLY
INSPECTION COVER
MANHOLE
SEPTIC TANK
SLUICE VALVE
STOPCOCK

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

No.	Date	Description
001	07/11/24	Original Drawing

PROJECT:

Social Housing Development
Gort Mhaolair
Atherny Co. Galway

SCALE : 1/200 A1

DATE : 07/11/2024

DRG No: 6682

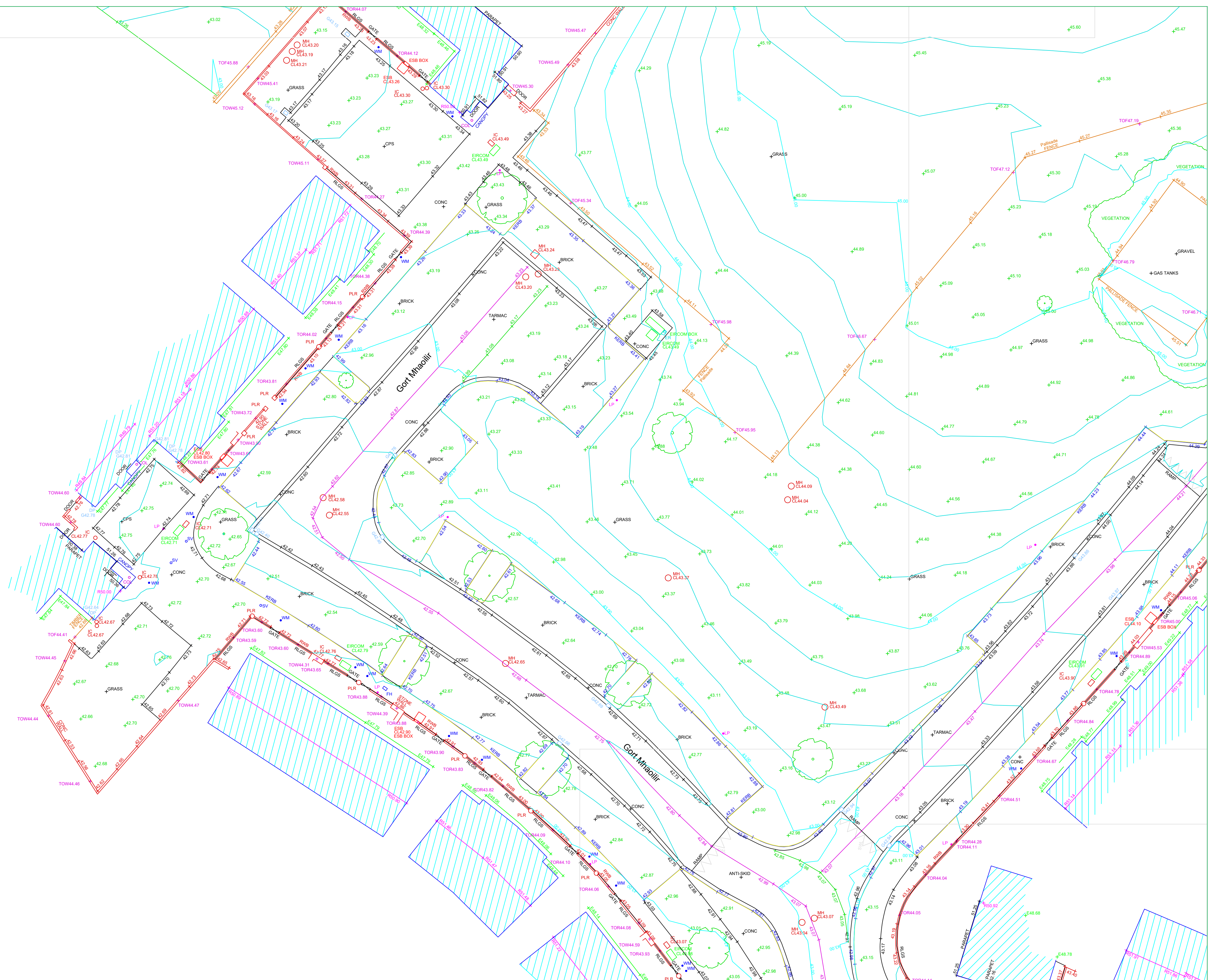
DESCRIPTION : 3D Topographical

SURVEYED BY : F.K.

SHEET: 1 of 6

PROCESSED BY : T.G.

CHECKED BY : A.B.

[illegible]

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

AIR VALVE	AJ	+
ARMSTRONG JUNCTION	AV	
CABLE TV IC	CLV	□
COVER LEVEL	QAT	
EIRCOM COVER	EIRCOM	□
EIRCOM JUNCTION BOX	EIRCOM BOX	□
ELECTRICAL CABLE PIT	ECP	○
ESAT COVER	ESAT	□
ESS COVER	ESS	□
ESS JUNCTION BOX	ESS BOX	□
FIRE HYDRANT	FM	
GAS VALVE	GV	+
GULLY	G	□
INSPECTION COVER	IC	□
MANHOLE	MH	
SEPTIC TANK	SEPTIC	□
SUICIDE VALVE	SV	○
STOPCOCK	ST	○

SERVICE BOX (UNKNOWN)
 TRAFFIC COVER
 VENT
 WATER METER
 UNABLE TO LIFT

LEVELS :

- BED LEVEL + BED101.50
- EAVE LEVEL + E101.50
- FLOOR LEVEL + FL101.50
- INVERT LEVEL + IL101.50
- ROAD LEVEL + 101.50
- ROOF LEVEL + R01.50
- SOFFIT LEVEL + SL101.50
- SPOT LEVEL + 101.50
- TOP OF FENCE LEVEL + TOP101.50
- TOP OF WALL LEVEL + TOW101.50
- WATER LEVEL + 101.50
- SURVEY CONTROL STATION (A)

The figure shows an aerial photograph of a building complex. A red rectangle is drawn over a portion of the complex, indicating the area of interest for the study. The complex consists of several interconnected buildings with varying rooflines and internal structures.

APEX
SURVEYS

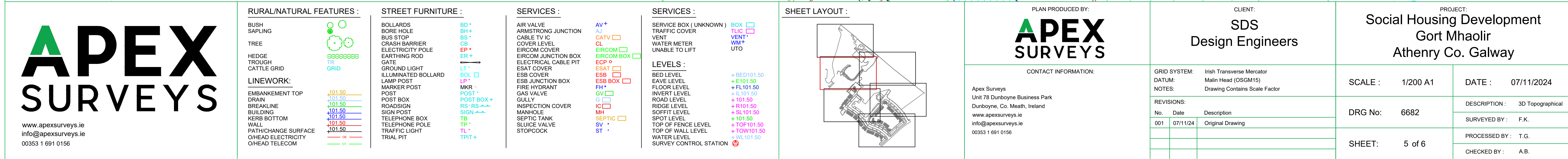
Apex Surveys
Unit 78 Dunboyne Business Park
Dunboyne, Co. Meath, Ireland
www.apexsurveys.ie
info@apexsurveys.ie
00353 1 691 0156

SDS
Design Engineers

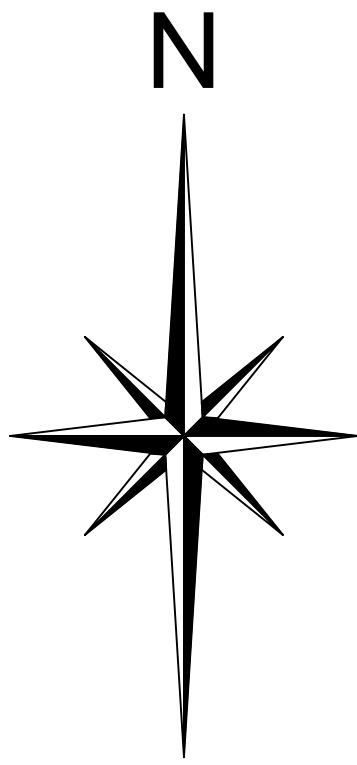
REVISIONS:		
No.	Date	Description
001	07/11/24	Original Drawing

SHEET: 2 of 6

CHECKED BY : A.B.



6



APEX
SURVEYS

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

RURAL/NATURAL FEATURES :

- BUSH
SAPLING
TREE
HEDGE
TROUGH
CATTLE GRID
LINEWORK:
EMBANKMENT TOP
DRAIN
BREAKLINE
BUILDING
KERB BOTTOM
WALL
PATH/CHANGE SURFACE
O/H ELEC
O/H ELEC
O/H ELEC

STREET FURNITURE :

- BOLLARDS
BORE HOLE
BUS STOP
CRASH BARRIER
ELECTRICITY POLE
EARTHING ROD
GATE
GROUND LIGHT
ILLUMINATED BOLLARD
LAMP POST
MARKER POST
POST
POST BOX
ROADSIGN
SIGN POST
TELEPHONE BOX
TELEPHONE POLE
TRAFFIC LIGHT
TRIAL PIT

SERVICES :

- AIR VALVE
ARMSTRONG JUNCTION
CABLE TV IC
COVER LEVEL
EIRCOM COVER
EIRCOM JUNCTION BOX
ELECTRICAL CABLE PIT
ESAT COVER
ESB COVER
ESB JUNCTION BOX
FIRE HYDRANT
GAS VALVE
GULLY
INSPECTION COVER
MANHOLE
SEPTIC TANK
SLUICE VALVE
STOPCOCK

SERVICES :

- AV+
CATV
CL
EIRCOM
EIRCOM BOX
ECP
ESAT
ESB
ESB BOX
FH
GV
IC
MH
SEPTIC
SV
ST

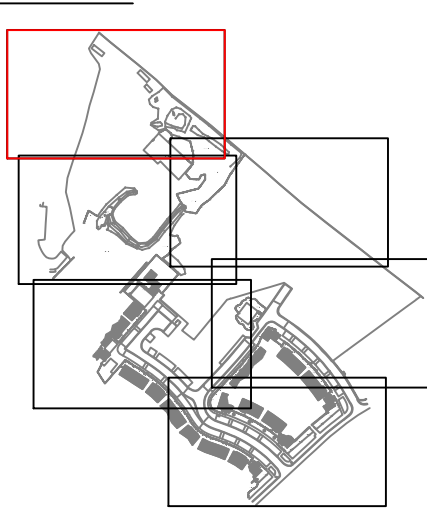
SERVICES :

- SERVICE BOX (UNKNOWN)
TRAFFIC COVER
VENT
WATER METER
UNABLE TO LIFT
LEVELS :
BED LEVEL
EAVE LEVEL
FLOOR LEVEL
INVERT LEVEL
ROAD LEVEL
RIDGE LEVEL
SOFFIT LEVEL
SPOT LEVEL
TOP OF FENCE LEVEL
TOP OF WALL LEVEL
WATER LEVEL
SURVEY CONTROL STATION

SERVICES :

- BOX
TLIC
VENT
WM
UTO
BED101.50
E101.50
FL101.50
L101.50
R101.50
SL101.50
TOP101.50
TOW101.50
V46.101.50

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	07/11/24	Original Drawing

PROJECT:

Social Housing Development
Gort Mhaolir
Athenry Co. Galway

SCALE : 1/200 A1

DATE : 07/11/2024

DRG No: 6682

DESCRIPTION : 3D Topographical

SHEET: 6 of 6

SURVEYED BY : F.K.

PROCESSED BY : T.G.

CHECKED BY : A.B.

APPENDIX B – SITE INVESTIGATION REPORT

S.I. Ltd Contract No: 6379

Client: Galway County Council
Engineer: SDS Design Engineers
Contractor: Site Investigations Ltd

Gort Mhaoilir,
Athenry, Co. Galway
Site Investigation Report

Prepared by:

.....
Stephen Letch

Issue Date:	29/01/2025
Status	Final
Revision	0

<u>Contents:</u>	Page No.
1. Introduction	1
2. Site Location	1
3. Fieldwork	1
4. Laboratory Testing	3
5. Ground Conditions	4
6. Recommendations and Conclusions	4

<u>Appendices:</u>
1. Cable Percussive Borehole Logs
2. Trial Pit Logs and Photographs
3. Soakaway Test Results and Photographs
4. Plate Test Results
5. Slit Trench Log
6. Geotechnical Laboratory Test Results
7. Environmental Laboratory Test Results
8. Waste Classification Report
9. Survey Data

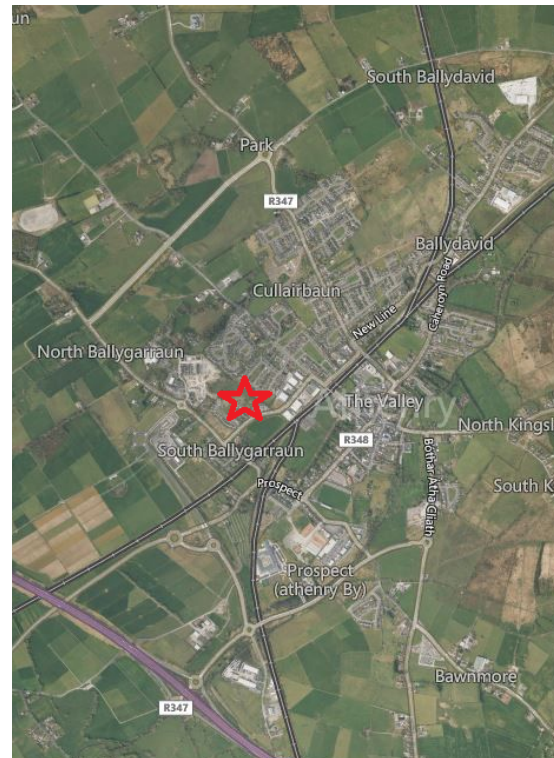
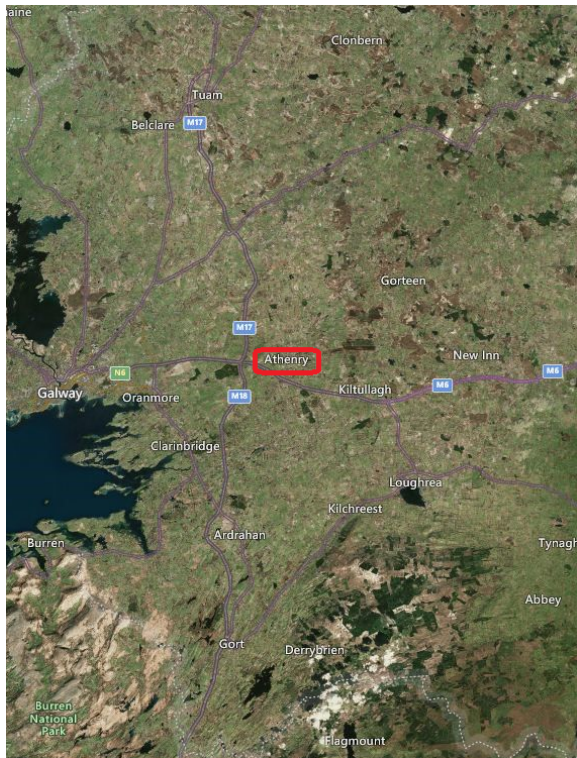
1. Introduction

On the instructions of SDS Design Engineers, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Gort Mhaoilir, Athenry, Co. Galway. The investigation was for a residential development and was completed on behalf of the Client, Galway County Council. The fieldworks were completed in November 2024.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

2. Site Location

Athenry is located to the east of Galway city in the west of Ireland with Gort Mhaoilir close to the town centre. The map on the left below shows the location of the Athenry to the east of Galway and the second map shows the location of the site in the town.



3. Fieldwork

All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016 and Eurocode 7: Geotechnical Design. The fieldworks comprised of the following:

- 6 No. cable percussive boreholes
- 7 No. trial pits
- 5 No. soakaway tests
- 5 No. plate tests
- 1 No. slit trench

3.1. Cable Percussive Boreholes

Cable percussion boring was undertaken at 6 No. locations using a Dando 2000 rig and constructed 200mm diameter boreholes. The boreholes terminated at shallow depths ranging from 1.60mbgl (BH01) to 3.70mbgl (BH05) after an hour and a half chiselling was completed and no further progress was made. It was not possible to collect undisturbed samples due to the granular soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g., BH02 at 1.00mbgl where N=12-(2,2/2,4,3,3)). Where refusal of 50 blows across the test zone was achieved during testing, the penetration depth is also reported (e.g., BH01 at 1.00mbgl where N=50-(2,8/50 for 140mm)).

At BH03, a groundwater monitoring standpipe was installed which consisted of a slotted pipe with a gravel response zone around the slotted section and bentonite seals at the surface.

The cable percussive borehole logs are presented in Appendix 1.

3.2. Trial Pits

7 No. trial pits were excavated using a tracked excavator and they were logged and photographed by SIL geotechnical engineer. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

The trial pit logs and photographs are presented in Appendix 2.

3.3. Soakaway Tests

At 5 No. locations, soakaway tests were completed and logged by SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and that the final

cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The soakaway test results and photographs are presented in Appendix 3.

3.4. Plate Tests

At 5 No. locations, plate tests were completed to provide a California Bearing Ratio value for pavement design. The tests were completed at 0.50mbgl, using the excavator as kentledge. Pressure is then added to a 600mm diameter plate, via a hydraulic jack, with the settlement of the plate measured using gauges. The rate of settlement is used to calculate the CBR value. After the test was completed, hand held shear vane tests were completed on the soil directly beneath the plate, with the results shown on the logs.

The plate test results are presented in Appendix 4.

3.5. Slit Trench

Due to the possibility of an old septic tank leaking on an adjacent site, a slit trench was completed to the north west of the site to see if any contamination was evident. The trench did identify a small area of some discolouration of the soil and this was measured and logged before the trench was backfilled.

The slit trench log is presented in Appendix 5.

3.6. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 9.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 5 No. Moisture contents
- 5 No. Atterberg limits
- 5 No. Particle size gradings
- 5 No. pH, sulphate and chloride content

Environmental testing was completed by ALS Environmental Ltd. and consists of the following:

- 5 No. Suite I analysis

The geotechnical laboratory test results are presented in Appendix 6 with the environmental tests reported in Appendix 7 and a Waste Classification Report in Appendix 8.

5. Ground Conditions

5.1. Overburden

MADE GROUND was identified at 2 No. locations, TP01 and TP03, to the south east of the site, to 1.20mbgl and 0.90mbgl respectively. This was logged as a cohesive clay dominant soil in TP01 and granular gravel dominant soil in TP03. Anthropogenic material of plastic, timber and concrete fragments were identified in the soil.

The natural ground conditions are generally cohesive brown slightly sandy gravelly silty CLAY with cobbles overlying grey slightly sandy gravelly silty CLAY with cobbles and boulders.

The SPT tests recorded values of 12 to 18 at 1.00mbgl, indicating firm to stiff soils, increasing to 17 to 24 at 2.00mbgl and 28 at 3.00mbgl in BH05, indicating stiff soils. Numerous refusals were completed across the site and this is due to the high cobble and boulder content within the soils.

The laboratory tests of the cohesive soils show CLAY soils with low plasticity indexes of 9 to 14% recorded. The particle size distribution curves were poorly sorted straight-line curves with low fines content of 23% to 40% in the cohesive soils.

5.2. Groundwater

No groundwater was recorded in the boreholes or trial pits during the fieldworks.

6. Recommendations and Conclusions

Please note the following caveats:

The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Shallow Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

MADE GROUND was encountered at TP01 and TP03 to 1.20mbgl. SIL do not recommend that narrow shallow foundations are placed on fill material due to the unknown compaction methods used during laying of man-made material. This unknown could result in softer spots and differential settlement once construction is completed. If shallow foundations are to be used and man-made soils are encountered below foundation level, then the soil should be removed and replaced with engineered fill which is compacted to the required standard.

For cohesive soils, a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices can be used to calculate the undrained shear strength. Dependent on the plasticity index at each site, the Stroud and Butler correlation is $C_u=4$ to $6N$. With the low plasticity indexes recorded in the laboratory for the soils on this site, the correlation chosen is $C_u=6N$. Using the lowest value of 12, this indicates a C_u value of 72kN/m^2 . This can then be used to calculate the ultimate bearing capacity, which is the total loading that the soil could withstand and this has been calculated as 385kN/m^2 . Finally, a factor of safety is applied to ensure that failure of the soils does not occur and a factor of safety of 3 has been chosen for this site. This provides an allowable bearing capacity of 130kN/m^2 .

It would be recommended that all founding strata be inspected by a suitably qualified Engineer prior to pouring the foundations and additional insitu testing completed if required to confirm the soils are suitable for the final foundation design.

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- Foundations are to be constructed on a level formation of uniform material type.

- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of 19kN/m³.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.
- All bearing capacity calculations allow for 25mm settlement.

The trial pit walls generally remained stable during excavation but TP05 and TP06 did record some instability and due to the high sand and gravel content in the soils, it would be recommended that all excavations should be checked immediately and battered back accordingly. Regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:

There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall or any nearby construction sites.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, no groundwater was recorded in the boreholes and trial pits during the fieldworks.

There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. Based on this information at the

exploratory hole locations to date, it is considered likely that any shallow ingress (less than 2.00mbgl) into excavations of the CLAY will be slow to medium.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Soakaway Tests

Two soakaway tests, INF1 and INF3, failed the specification as the water level did not fall sufficiently enough to complete the test. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The tests were terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e., well compacted cohesive soils.

The remaining three tests did pass the specification with similar f-values of 2.65×10^{-5} m/s to 4.22×10^{-5} m/s. Any soakaway should be designed using these f-values.

6.4. Pavement Design

The plate test results in Appendix 4 recorded values of 15.6% to 19.6%.

The plate tests were completed at 0.50mbgl and inspection of the formation strata should be completed prior to construction of the pavement. Once the exact formation levels are finalised then additional in-situ testing could be completed to assist with the detailed pavement design.

6.5. Contamination

Environmental testing was carried out on five samples from the investigation and the results are shown in Appendix 7. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material.

Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would generally be able to be treated as Inert Waste. The sample from ST01 did record an elevated sulphate level but this was from the soils showing discolouration from

the possible leaking septic tank on the adjacent site so this may be localised rather than widespread.

Five samples were tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

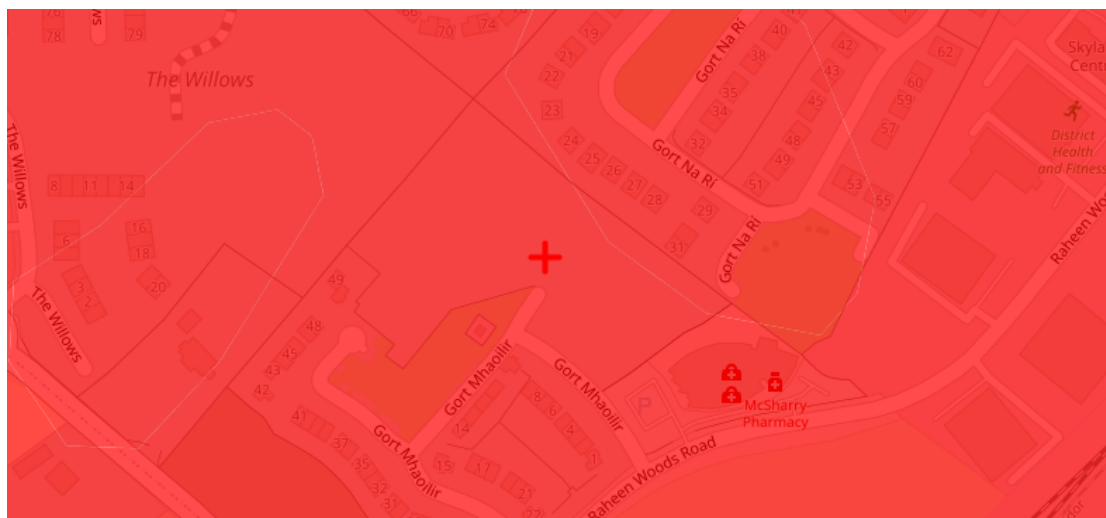
6.6. Aggressive Ground Conditions

The chemical test results in Appendix 6 indicate a general pH value between 8.72 and 8.85, which is close to neutral and below the level of 9.

The maximum value obtained for water soluble sulphate was 126mg/l as SO_3 . The BRE Special Digest 1:2005 – ‘Concrete in Aggressive Ground’ guidelines require SO_4 values and after conversion ($\text{SO}_4 = \text{SO}_3 \times 1.2$), the maximum value of 151mg/l shows Class 1 conditions and no special precautions are required.

6.7. Radon Gas

The Environmental Protection Agency (EPA) has recently updated the Radon gas exposure map and this is available to view on the EPA website. This shows the possible exposure to radon gas with the bedrock geology, subsoil geology, soil permeability and aquifer type analysed to produce the map. The map below shows that the site falls within the high level of 1 in 5 homes are at risk of radon exposure. Measures should be taken in the form of radon protection barriers from radon exposure in the new structures.

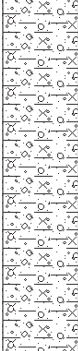


EPA map identifying possible Radon exposure.

<https://gis.epa.ie/EPAMaps/Radon?&lid=EPA:RadonRiskMapofIreland>

Appendix 1

Cable Percussive Borehole Logs

Contract No: 6379		Cable Percussion Borehole Log										Borehole No: BH01			
Contract:		Gort Mhaoilir					Easting:		549565.680		Date Started:		06/11/2024		
Location:		Athenry, Co. Galway					Northing:		728009.940		Date Completed:		06/11/2024		
Client:		Galway County Council					Elevation:		45.53		Drilled By:		D. McEoin		
Engineer:		SDS Design Engineers					Borehole Diameter:		200mm		Status:		FINAL		
Depth (m)		Stratum Description					Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill
Scale	Depth							Scale	Depth	Depth	Type	Result			
0.20		TOPSOIL.						45.33							
0.5		Brown sandy slightly gravelly silty CLAY with high cobble content.						45.0							
1.0								44.5	1.00	B		DMc01			
1.40								44.13	1.00	C		50 (2,8/50 for 140mm)			
1.5		Obstruction - possible boulders.						44.0							
1.60		End of Borehole at 1.60m						43.93	1.60	C		50 (25 for 5mm/50 for 5mm)			
2.0								43.5							
2.5								43.0							
3.0								42.5							
3.5								42.0							
4.0								41.5							
4.5								41.0							
															
															
															
															
															
															
															
															
															
															

[illegible]

Contract No: 6379			Cable Percussion Borehole Log											Borehole No: BH03				
Contract:			Gort Mhaoilir						Easting:		549617.943			Date Started:		07/11/2024		
Location:			Athenry, Co. Galway						Northing:		728020.002			Date Completed:		07/11/2024		
Client:			Galway County Council						Elevation:		45.53			Drilled By:		D. McEoin		
Engineer:			SDS Design Engineers						Borehole Diameter:		200mm			Status:		FINAL		
Depth (m)			Stratum Description						Legend	Level (mOD)		Samples and Insitu Tests					Water Strike	Backfill
Scale	Depth									Scale	Depth	Depth	Type	Result				

Contract No: 6379				Cable Percussion Borehole Log										Borehole No: BH04					
Contract:				Gort Mhaoilir					Easting:		549568.282			Date Started:		08/11/2024			
Location:				Athenry, Co. Galway					Northing:		728052.783			Date Completed:		08/11/2024			
Client:				Galway County Council					Elevation:		46.35			Drilled By:		D. McEoin			
Engineer:				SDS Design Engineers					Borehole Diameter:		200mm			Status:		FINAL			
Depth (m)		Stratum Description								Legend	Level (mOD)		Samples and Insitu Tests					Water Strike	Backfill
Scale	Depth										Scale	Depth	Depth	Type	Result				
	0.20	TOPSOIL. Firm brown sandy slightly gravelly silty CLAY with high cobble content.									46.15								
	0.5										46.0								
	1.0										45.5								
	1.10	Stiff brown grey sandy slightly gravelly silty CLAY with high cobble content.									45.25	1.00	1.00	B	DMc06 N=18 (2,3/4,4,5,5)				
	1.5										45.0								
	2.0										44.5								
	2.40	Obstruction - possible boulders.									44.0								
	2.60										43.95								
		End of Borehole at 2.60m									43.75	2.60		C	50 (25 for 5mm/50 for 5mm)				
	3.0										43.5								
	3.5																		
	4.0										43.0								
	4.5										42.5								
											42.0								
											41.5								
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Borehole terminated due to obstruction.		
		1.80	1.90	01:00				08/11	2.60	Dry				0.00	2.60	Arisings			

Contract No: 6379				Cable Percussion Borehole Log										Borehole No: BH05				
Contract:				Gort Mhaoilir					Easting:		549516.648			Date Started:		07/11/2024		
Location:				Athenry, Co. Galway					Northing:		728104.100			Date Completed:		07/11/2024		
Client:				Galway County Council					Elevation:		45.02			Drilled By:		D. McEoin		
Engineer:				SDS Design Engineers					Borehole Diameter:		200mm			Status:		FINAL		
Depth (m)		Stratum Description								Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill
Scale	Depth										Scale	Depth	Depth	Type	Result			
0.20 0.5 1.0 1.5 2.0 2.5 3.0 3.5 3.70 4.0 4.5	0.20 <																	

Contract No: 6379		Cable Percussion Borehole Log											Borehole No: BH06						
Contract:		Gort Mhaoilir					Easting:		549481.870			Date Started:		08/11/2024					
Location:		Athenry, Co. Galway					Northing:		728052.619			Date Completed:		08/11/2024					
Client:		Galway County Council					Elevation:		46.08			Drilled By:							
Engineer:		SDS Design Engineers					Borehole Diameter:		200mm			Status:		FINAL					
Depth (m)		Stratum Description					Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill				
Scale	Depth							Scale	Depth	Depth	Type	Result							
	0.30	TOPSOIL.						46.0											
	0.5	Firm brown sandy slightly gravelly silty CLAY with high cobble content.						45.78											
									45.5										
										45.0	1.00	B	DMc11 N=14 (2,2/3,4,3,4)						
	1.0							45.0	1.00	C									
	1.5	1.50	Stiff brown grey sandy slightly gravelly silty CLAY with high cobble content.						44.58										
	2.0							44.5											
									44.0	2.00	B	DMc12 N=22 (2,4/5,5,6,6)							
										44.0	2.00		C						
	2.5								43.5										
	3.0								43.0	3.00	B	DMc13 50 (4,5/50 for 125mm)							
									43.0	3.00	C								
	3.30	3.30	Obstruction - possible boulders.						42.78										
3.40	3.40	End of Borehole at 3.40m						42.68	3.40	C	50 (25 for 5mm/50 for 5mm)								
3.5								42.5											
4.0								42.0											
4.5								41.5											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Borehole terminated due to obstruction.		
		1.70 3.30	1.80 3.40	01:00 01:30				08/11	3.40	Dry				0.00	3.40	Arisings			

Appendix 2

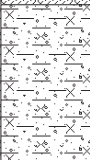
Trial Pit Logs and Photographs

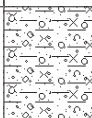
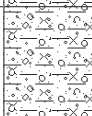
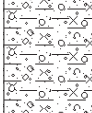
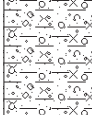
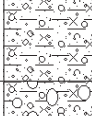
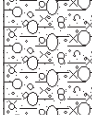
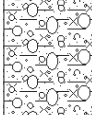
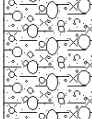
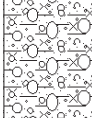
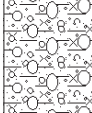
[illegible]

Contract No: 6379		Trial Pit Log					Trial Pit No: TP02				
Contract:		Gort Mhaoilir		Easting:		549540.830		Date:		01/11/2024	
Location:		Athenry, Co. Galway		Northing:		728046.118		Excavator:		JCB 3CX	
Client:		Galway County Council		Elevation:		45.88		Logged By:		M. Kaliski	
Engineer:		SDS Design Engineers		Dimensions (LxWxD) (m):		3.70 x 0.50 x 3.00		Status:		FINAL	
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale: Depth						Scale: Depth:	Depth:	Type	Result		
0.30		TOPSOIL.				45.58					
0.5		Firm grey slightly sandy gravelly silty CLAY with high cobble content and occasional gravel laminas. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.				45.5		0.50	ES	MK09	
1.0					45.0		1.00	B	MK10		
1.5					44.5						
2.0					44.0						
2.10		Firm becoming stiff grey slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).				43.78					
2.5					43.5		2.50	B	MK11		
3.00		Pit terminated at 3.00m				42.88					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:			
		Scheduled depth.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			

[illegible]

[illegible]

Contract No: 6379		Trial Pit Log						Trial Pit No: TP05		
Contract:		Gort Mhaolir		Easting:	549536.109		Date:	01/11/2024		
Location:		Athenry, Co. Galway		Northing:	728085.166		Excavator:	JCB 3CX		
Client:		Galway County Council		Elevation:	45.67		Logged By:	M. Kaliski		
Engineer:		SDS Design Engineers		Dimensions (LxWxD) (m):	3.60 x 0.50 x 2.70		Status:	FINAL		
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	
	0.15	TOPSOIL.				45.5	45.52			
		Firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.								
	0.50	Firm grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).				45.17				
						45.0				
						44.5		1.00	B	MK07
	1.40	Firm becoming stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 400mm diameter).				44.27				
						44.0				
	2.0					43.5		2.00	B	MK08
						43.0				
	2.70	Pit terminated due to pit wall instability, Pit terminated at 2.70m					42.97			
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:			
		Pit wall instability.	Instability below 1.00mbgl.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			

Contract No: 6379		Trial Pit Log					Trial Pit No: TP06			
Contract:		Gort Mhaoilir		Easting:	549505.510	Date:	01/11/2024			
Location:		Athenry, Co. Galway		Northing:	728092.634	Excavator:	JCB 3CX			
Client:		Galway County Council		Elevation:	45.28	Logged By:	M. Kaliski			
Engineer:		SDS Design Engineers		Dimensions (LxWxD) (m):	3.40 x 0.50 x 2.70	Status:	FINAL			
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	
	0.10	TOPSOIL.					45.18			
		Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.					45.0			
0.5		Firm grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.						0.50	ES	MK01
	0.80						44.5	44.48		
1.0								1.00	B	MK02
							44.0			
1.5		Firm becoming stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 600mm diameter).								
	1.70						43.5	43.58		
2.0								2.00	B	MK03
							43.0			
	2.70	Pit terminated due to pit wall instability, Pit terminated at 2.70m					42.5	42.58		
										
										
										
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:				
		Pit wall instability.	Instability below 1.50mbgl.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental				

Contract No: 6379		Trial Pit Log					Trial Pit No: TP07				
Contract:		Gort Mhaoilir		Easting:		549482.689		Date:		01/11/2024	
Location:		Athenry, Co. Galway		Northing:		728064.657		Excavator:		JCB 3CX	
Client:		Galway County Council		Elevation:		46.04		Logged By:		M. Kaliski	
Engineer:		SDS Design Engineers		Dimensions (LxWxD) (m):		2.80 x 0.50 x 3.00		Status:		FINAL	
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.				46.0					
0.40		Firm becoming stiff grey slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).				45.64					
0.5					45.5	0.50	ES	MK04			
1.0					45.0	1.00	B	MK05			
1.5					44.5						
2.0						44.0					
2.5						43.5	2.60	B	MK06		
3.00		Pit terminated at 3.00m				43.04					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:			
		Scheduled depth.	Pit walls stable.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			

TP01 Sidewall



TP01 Spoil



TP02 Sidewall



TP02 Spoil



TP03 Sidewall



TP03 Spoil



TP04 Sidewall



TP04 Spoil



TP05 Sidewall



TP05 Spoil



TP06 Sidewall



TP06 Spoil



TP07 Sidewall



TP07 Spoil



Appendix 3

Soakaway Test Results and Photographs

SOAKAWAY TEST



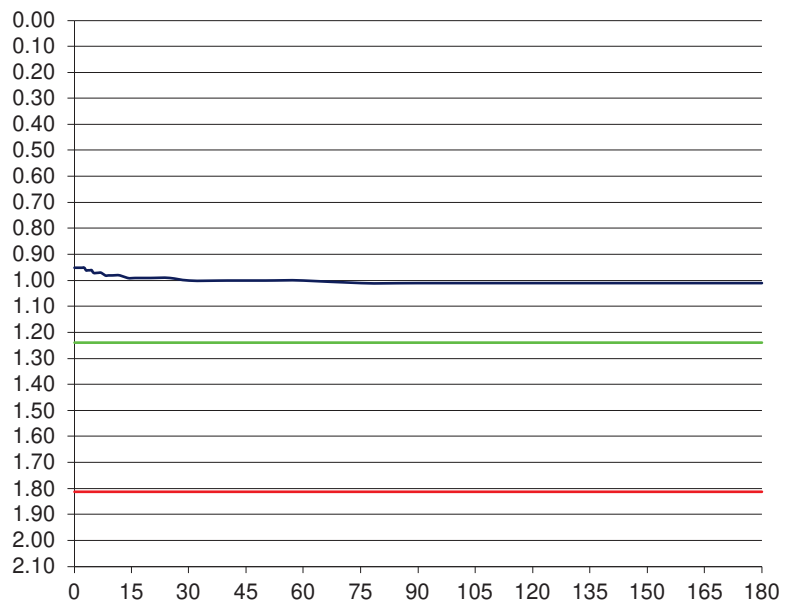
Project Reference:	6379
Contract name:	Gort Mhaolir
Location:	Athenry, Co. Galway
Test No:	INF01
Date:	10/12/2024

Ground Conditions

From	To	
0.00	0.50	TOPSOIL.
0.50	2.10	Firm becoming stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	0.95
0.5	0.95
1	0.95
1.5	0.95
2	0.95
2.5	0.95
3	0.96
3.5	0.96
4	0.96
4.5	0.96
5	0.97
6	0.97
7	0.97
8	0.98
9	0.98
10	0.98
12	0.98
14	0.99
16	0.99
18	0.99
20	0.99
25	0.99
30	1.00
40	1.00
50	1.00
60	1.00
75	1.01
90	1.01
120	1.01
180	1.01

Pit Dimensions (m)		
Length (m)	2.50	m
Width (m)	0.60	m
Depth	2.10	m
Water		
Start Depth of Water	0.95	m
Depth of Water	1.15	m
75% Full	1.24	m
25% Full	1.81	m
75%-25%	0.58	m
Volume of water (75%-25%)	0.86	m3
Area of Drainage	13.02	m2
Area of Drainage (75%-25%)	5.07	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	N/A	min
Time 75% to 25% (sec)	N/A	sec



f = Fail or
m/min

Fail
m/s

SOAKAWAY TEST



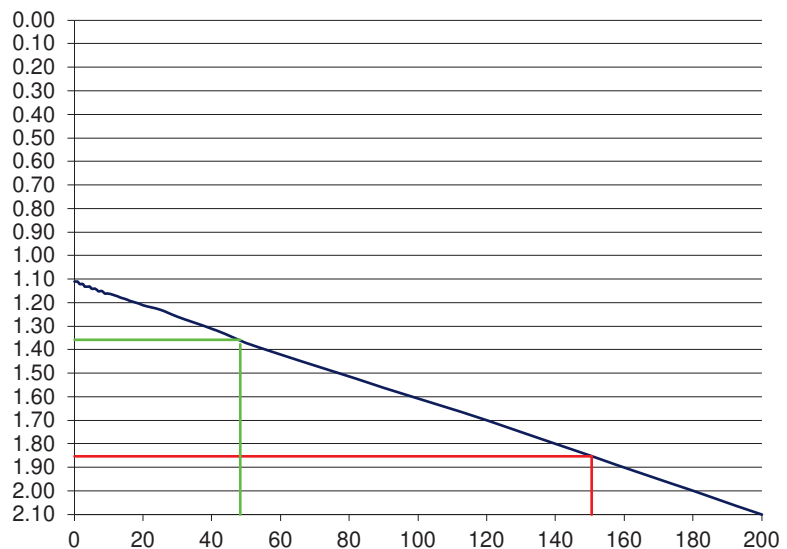
Project Reference:	6379
Contract name:	Gort Mhaoilir
Location:	Athenry, Co. Galway
Test No:	INF02
Date:	10/12/2024

Ground Conditions

From	To	
0.00	0.70	MADE GROUND: brown sandy slightly gravelly silty clay with some plastic fragments.
0.70	1.00	Soft brown sandy slightly gravelly silty CLAY.
1.00	1.90	Firm grey brown slightly sandy gravelly silty CLAY with low cobble content.
1.90	2.10	Stiff grey slightly sandy gravelly silty CLAY with medium cobble content.

Elapsed Time (mins)	Fall of Water (m)
0	1.11
0.5	1.11
1	1.11
1.5	1.12
2	1.12
2.5	1.12
3	1.13
3.5	1.13
4	1.13
4.5	1.13
5	1.14
6	1.14
7	1.15
8	1.15
9	1.16
10	1.16
12	1.17
14	1.18
16	1.19
18	1.20
20	1.21
25	1.23
30	1.26
40	1.31
50	1.37
60	1.42
90	1.56
120	1.70
150	1.85
180	2.00
200	2.10

Pit Dimensions (m)	
Length (m)	2.50 m
Width (m)	0.60 m
Depth	2.10 m
Water	
Start Depth of Water	1.11 m
Depth of Water	0.99 m
75% Full	1.36 m
25% Full	1.85 m
75%-25%	0.50 m
Volume of water (75%-25%)	0.74 m ³
Area of Drainage	13.02 m ²
Area of Drainage (75%-25%)	4.57 m ²
Time	
75% Full	48.33 min
25% Full	150.5 min
Time 75% to 25%	102.17 min
Time 75% to 25% (sec)	6130.2 sec



$$f = \frac{0.00159}{\text{m/min}}$$

$$\frac{2.65E-05}{\text{m/s}}$$

SOAKAWAY TEST



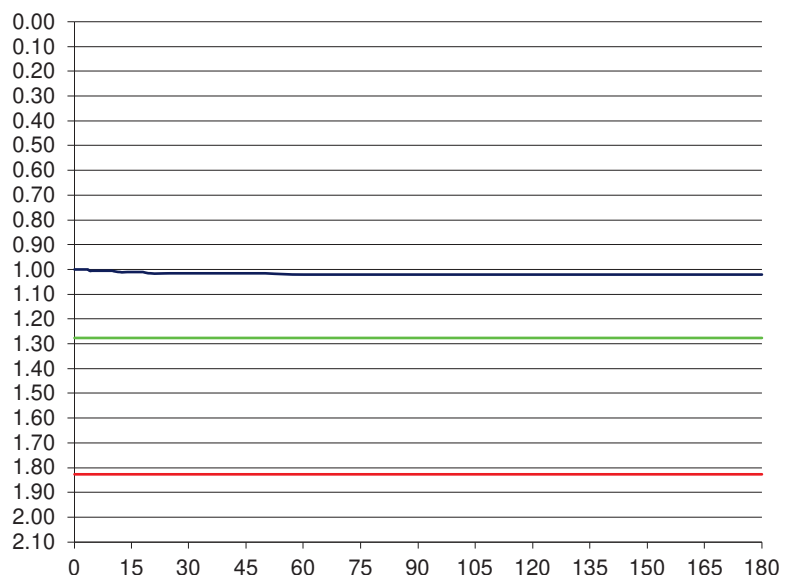
Project Reference:	6379
Contract name:	Gort Mhaoilir
Location:	Athenry, Co. Galway
Test No:	INF03
Date:	01/11/2024

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	0.90	Grey very silty sandy GRAVEL with high cobble and low boulder content.
0.90	2.10	Firm becoming stiff grey slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.00
0.5	1.00
1	1.00
1.5	1.00
2	1.00
2.5	1.00
3	1.00
3.5	1.00
4	1.01
4.5	1.01
5	1.01
6	1.01
7	1.01
8	1.01
9	1.01
10	1.01
12	1.01
14	1.01
16	1.01
18	1.01
20	1.02
25	1.02
30	1.02
40	1.02
50	1.02
60	1.02
75	1.02
90	1.02
120	1.02
180	1.02

Pit Dimensions (m)		
Length (m)	3.30	m
Width (m)	0.40	m
Depth	2.10	m
Water		
Start Depth of Water	1.00	m
Depth of Water	1.10	m
75% Full	1.28	m
25% Full	1.83	m
75%-25%	0.55	m
Volume of water (75%-25%)	0.73	m3
Area of Drainage	15.54	m2
Area of Drainage (75%-25%)	5.39	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	N/A	min
Time 75% to 25% (sec)	N/A	sec



f = Fail or
m/min

Fail
m/s

SOAKAWAY TEST



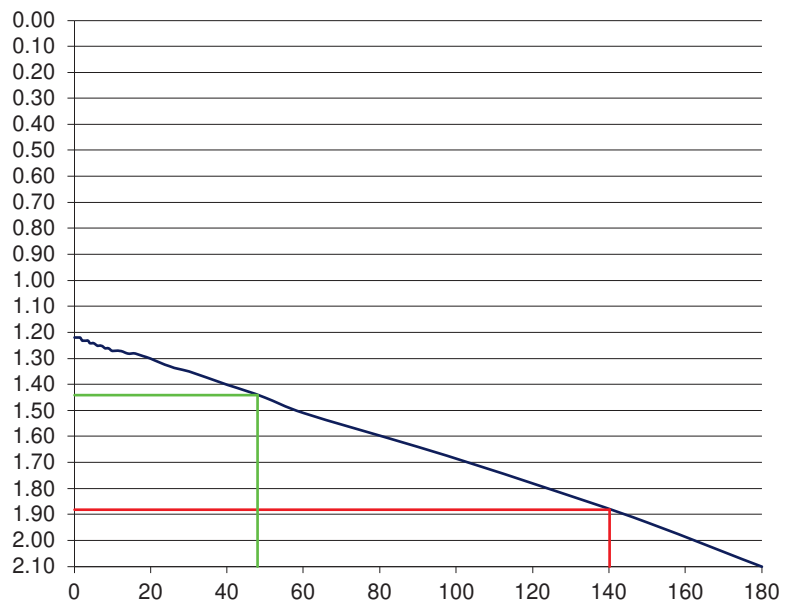
Project Reference:	6379
Contract name:	Gort Mhaoilir
Location:	Athenry, Co. Galway
Test No:	INF04
Date:	10/12/2024

Ground Conditions

From	To	
0.00	0.40	TOPSOIL.
0.40	2.10	Firm becoming stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.22
0.5	1.22
1	1.22
1.5	1.22
2	1.23
2.5	1.23
3	1.23
3.5	1.23
4	1.24
4.5	1.24
5	1.24
6	1.25
7	1.25
8	1.26
9	1.26
10	1.27
12	1.27
14	1.28
16	1.28
18	1.29
20	1.30
25	1.33
30	1.35
40	1.40
50	1.45
60	1.51
90	1.64
120	1.78
150	1.93
180	2.10

Pit Dimensions (m)		
Length (m)	2.70	m
Width (m)	0.60	m
Depth	2.10	m
Water		
Start Depth of Water	1.22	m
Depth of Water	0.88	m
75% Full	1.44	m
25% Full	1.88	m
75%-25%	0.44	m
Volume of water (75%-25%)	0.71	m ³
Area of Drainage	13.86	m ²
Area of Drainage (75%-25%)	4.52	m ²
Time		
75% Full	48	min
25% Full	140	min
Time 75% to 25%	92	min
Time 75% to 25% (sec)	5520	sec



$$f = \underline{0.00171} \text{ m/min}$$

$$\underline{2.85E-05} \text{ m/s}$$

SOAKAWAY TEST



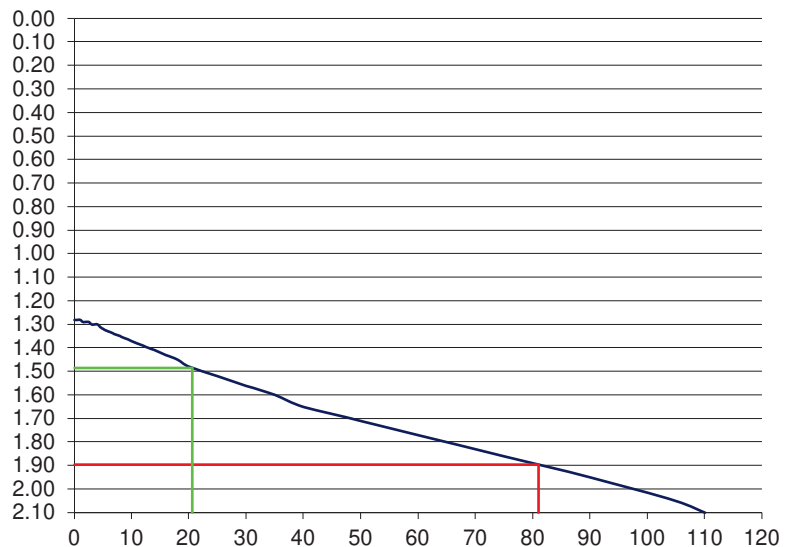
Project Reference:	6379
Contract name:	Gort Mhaoilir
Location:	Athenry, Co. Galway
Test No:	INF05
Date:	10/12/2024

Ground Conditions

From	To	
0.00	0.60	MADE GROUND: grey sandy slightly gravelly silty clay with medium cobble content and some plastic fragments.
0.60	0.80	Firm brown sandy slightly gravelly silty clay with medium cobble content.
0.80	2.10	Firm becoming stiff grey slightly sandy gravelly silty CLAY with medium cobble and boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.28
0.5	1.28
1	1.28
1.5	1.29
2	1.29
2.5	1.29
3	1.30
3.5	1.30
4	1.30
4.5	1.31
5	1.32
6	1.33
7	1.34
8	1.35
9	1.36
10	1.37
12	1.39
14	1.41
16	1.43
18	1.45
20	1.48
25	1.52
30	1.56
35	1.60
40	1.65
50	1.71
60	1.77
75	1.86
90	1.95
105	2.05
110	2.10

Pit Dimensions (m)		
Length (m)	2.60	m
Width (m)	0.60	m
Depth	2.10	m
Water		
Start Depth of Water	1.28	m
Depth of Water	0.82	m
75% Full	1.49	m
25% Full	1.90	m
75%-25%	0.41	m
Volume of water (75%-25%)	0.64	m3
Area of Drainage	13.44	m2
Area of Drainage (75%-25%)	4.18	m2
Time		
75% Full	20.6	min
25% Full	81	min
Time 75% to 25%	60.4	min
Time 75% to 25% (sec)	3624	sec



$f = \underline{0.00253}$ or
m/min

$\underline{4.22E-05}$
m/s

INF1 Sidewall



INF1 Spoil



INF2 Sidewall



INF2 Spoil



INF3 Sidewall



INF3 Spoil



INF4 Sidewall



INF4 Spoil



INF5 Sidewall



INF5 Spoil



Appendix 4

Plate Test Results

Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email:info@siteinvestigations.ie

Client	Galway County Council	
Site	Gort Mhaolair, Athenry	
Test Date	08-Nov-24	
Location:	PT01	
	Plate Diameter:	600mm
Type of reaction Load	13tonne tracked excavator	
Material Type:	slightly sandy slightly gravelly silty CLAY	
	Depth test carried out:	0.50m BGL
	CBR value is as per specification for 762mm Plate	

1.25mm settlement (graph) for 762mm Plate (kPa)	79
Equivalent CBR Value-Initial loading (%)	18.7
Mod. of subgrade Reaction k for 600mm Plate(kPa)	67
Correction factor for 600mm Plate	0.85

Pressure Stages	Bearing Pressure (kN/m ²)	Plate Settlement (mm)	
Initial	0.0	0.00	
	25	0.35	
	50	1.19	
	151	1.88	
	200	3.18	
	0.0	1.58	
Reload	50	2.62	
	151	2.73	
	200	3.37	
Final Condition	0.0	2.38	
ITM Co-ords	Easting	Northing	Level

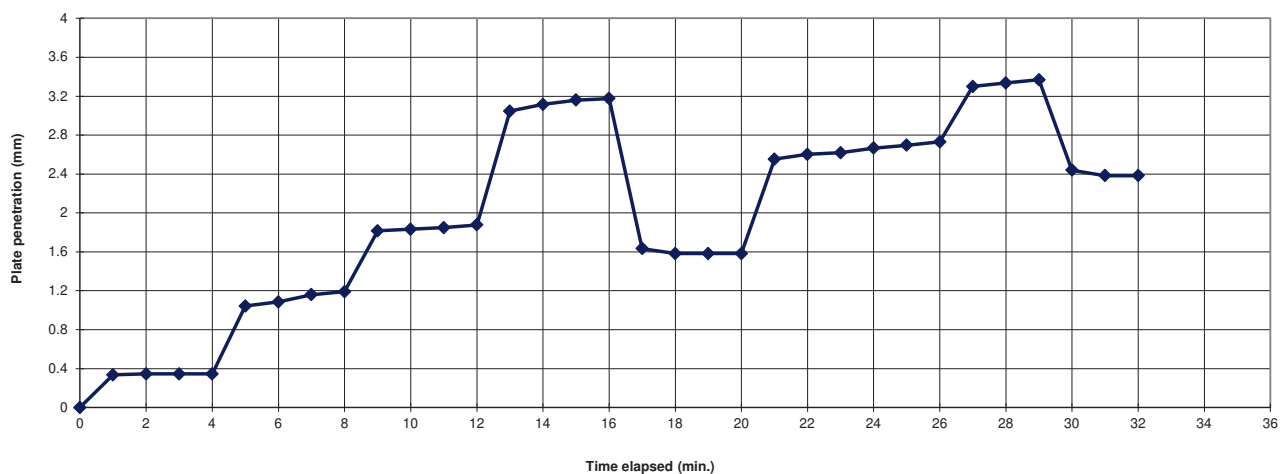
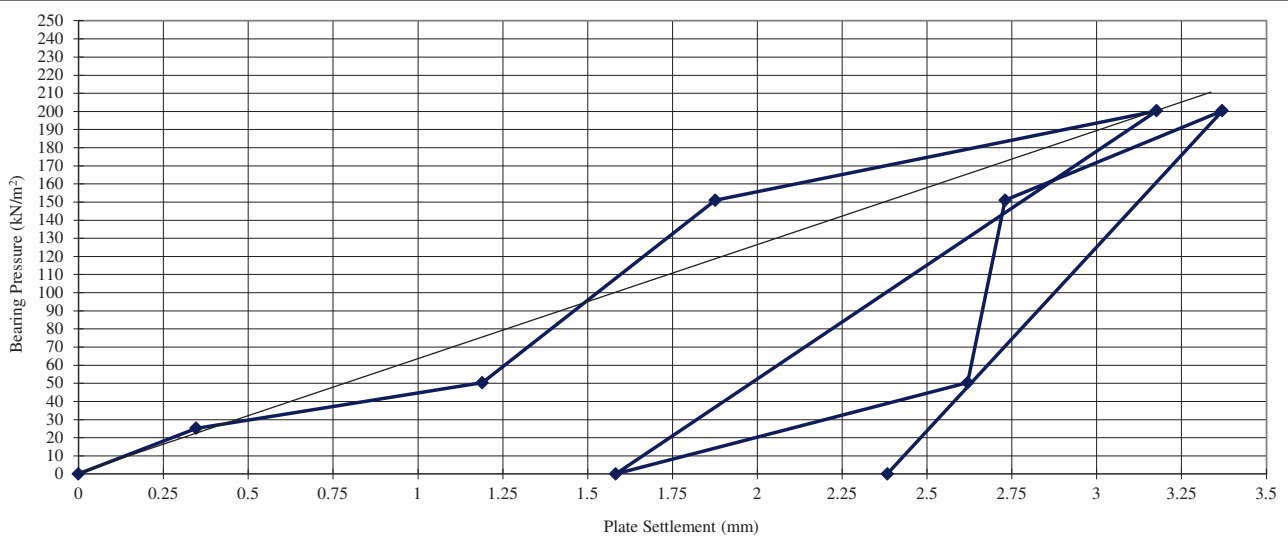


Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Client	Galway County Council	
Site	Gort Mhaolir, Athenry	
Test Date	08-Nov-24	
Location:	PT02	
Plate Diameter:		600mm
Type of reaction Load	13tonne tracked excavator	
Material Type:	slightly sandy slightly gravelly silty CLAY	
Depth test carried out:		0.50m BGL
CBR value is as per specification for 762mm Plate		

1.25mm settlement (graph) for 762mm Plate (kPa)	77
Equivalent CBR Value-Initial loading (%)	17.9
Mod. of subgrade Reaction k for 600mm Plate(kPa)	65
Correction factor for 600mm Plate	0.85

Pressure Stages	Bearing Pressure (kN/m ²)	Plate Settlement (mm)	
Initial	0.0	0.00	
	25	0.29	
	50	0.59	
	151	1.15	
	200	3.25	
	0.0	1.36	
Reload	50	2.35	
	151	2.68	
	200	3.47	
Final Condition	0.0	1.00	
ITM Co-ords	Easting	Northing	Level

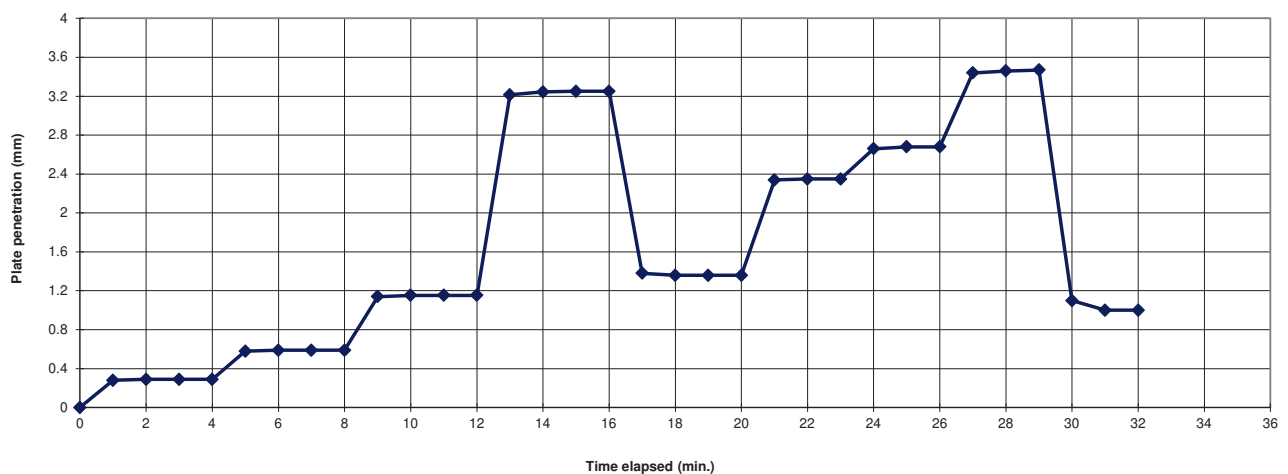
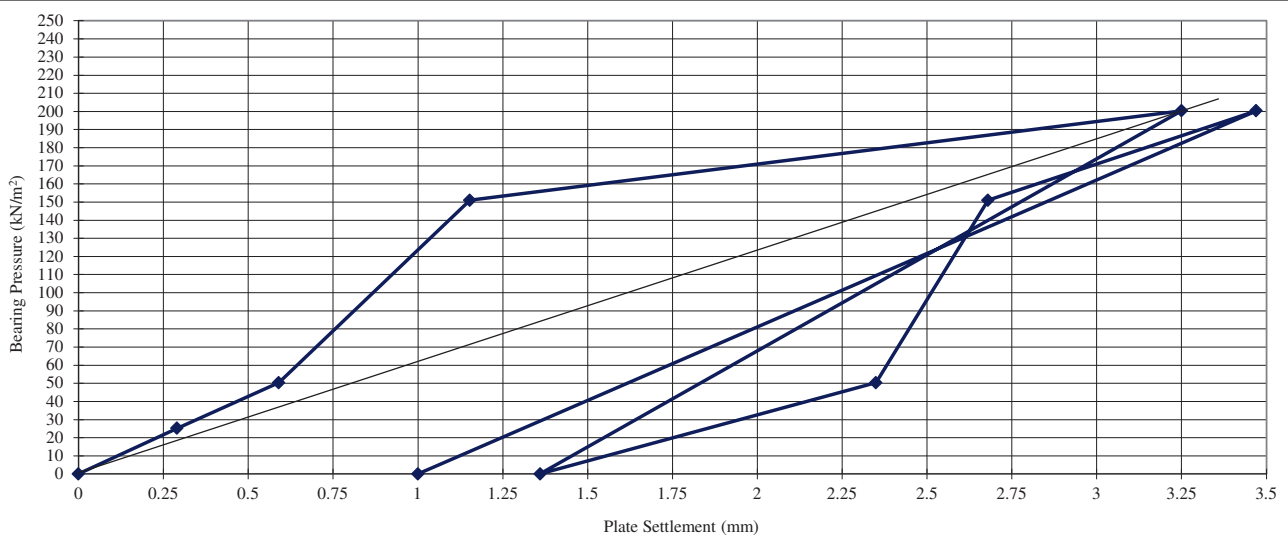


Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email:info@siteinvestigations.ie

Client	Galway County Council	
Site	Gort Mhaolir, Athenry	
Test Date	08-Nov-24	
Location:	PT03	
Plate Diameter:		600mm
Type of reaction Load	13tonne tracked excavator	
Material Type:	slightly sandy slightly gravelly silty CLAY	
Depth test carried out:		0.50m BGL
CBR value is as per specification for 762mm Plate		

1.25mm settlement (graph) for 762mm Plate (kPa)	81
Equivalent CBR Value-Initial loading (%)	19.6
Mod. of subgrade Reaction k for 600mm Plate(kPa)	69
Correction factor for 600mm Plate	0.85

Pressure Stages	Bearing Pressure (kN/m ²)	Plate Settlement (mm)	
Initial	0.0	0.00	
	25	0.13	
	50	0.61	
	151	1.80	
	200	3.08	
	0.0	1.12	
Reload	50	1.66	
	151	2.49	
	200	3.26	
Final Condition	0.0	1.41	
ITM Co-ords	Easting	Northing	Level

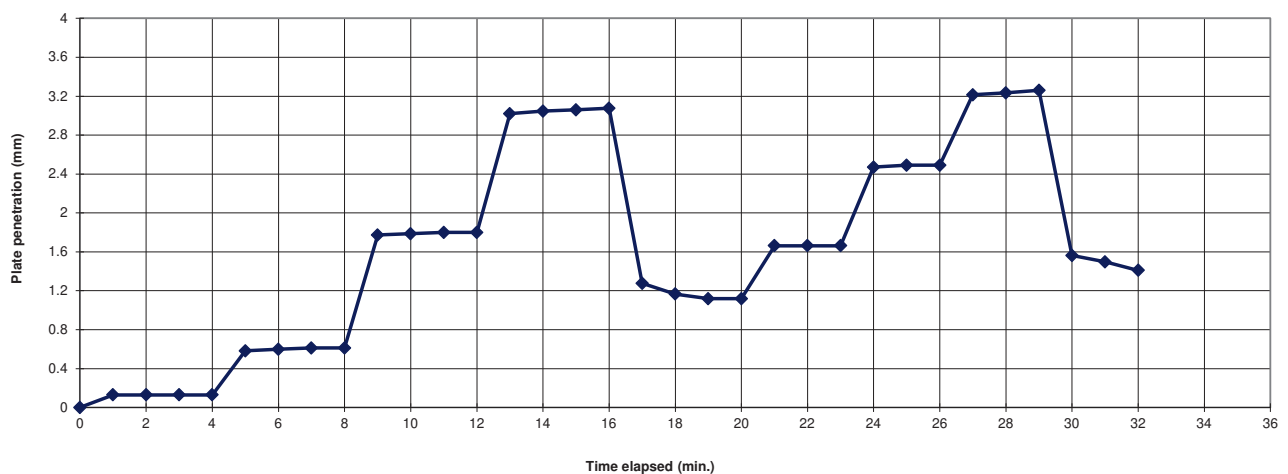
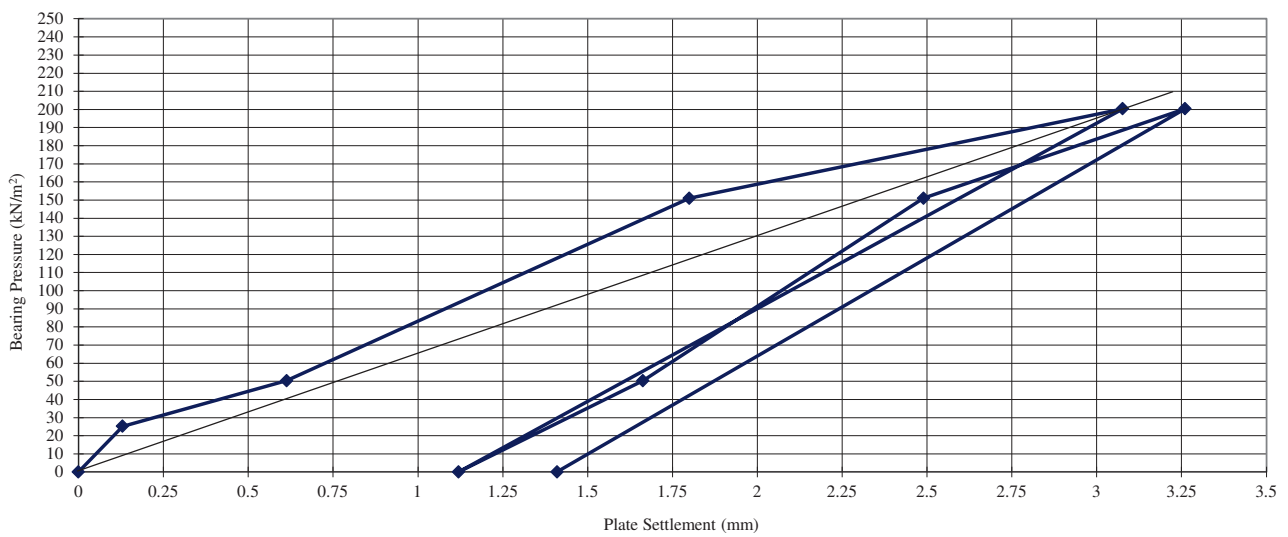


Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email:info@siteinvestigations.ie

Client	Galway County Council	
Site	Gort Mhaolair, Athenry	
Test Date	08-Nov-24	
Location:	PT04	
Plate Diameter:		600mm
Type of reaction Load	13tonne tracked excavator	
Material Type:	slightly sandy slightly gravelly silty CLAY	
Depth test carried out:		0.50m BGL
CBR value is as per specification for 762mm Plate		

1.25mm settlement (graph) for 762mm Plate (kPa)	74
Equivalent CBR Value-Initial loading (%)	16.7
Mod. of subgrade Reaction k for 600mm Plate(kPa)	63
Correction factor for 600mm Plate	0.85

Pressure Stages	Bearing Pressure (kN/m ²)	Plate Settlement (mm)	
Initial	0.0	0.00	
	25	0.15	
	50	0.68	
	151	1.96	
	200	3.34	
	0.0	1.14	
Reload	50	1.77	
	151	2.67	
	200	3.50	
Final Condition	0.0	1.43	
ITM Co-ords	Eastings	Northing	Level

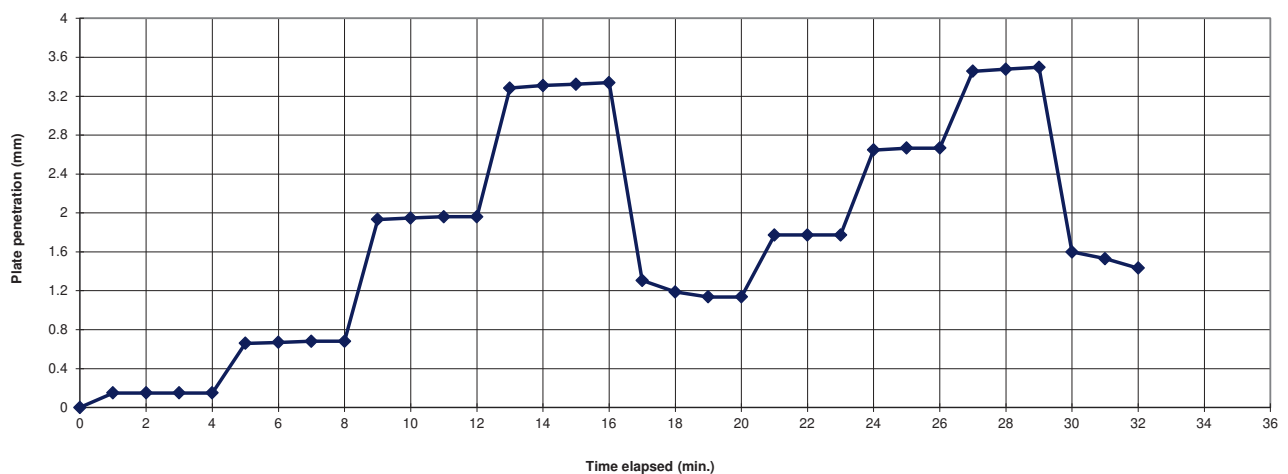
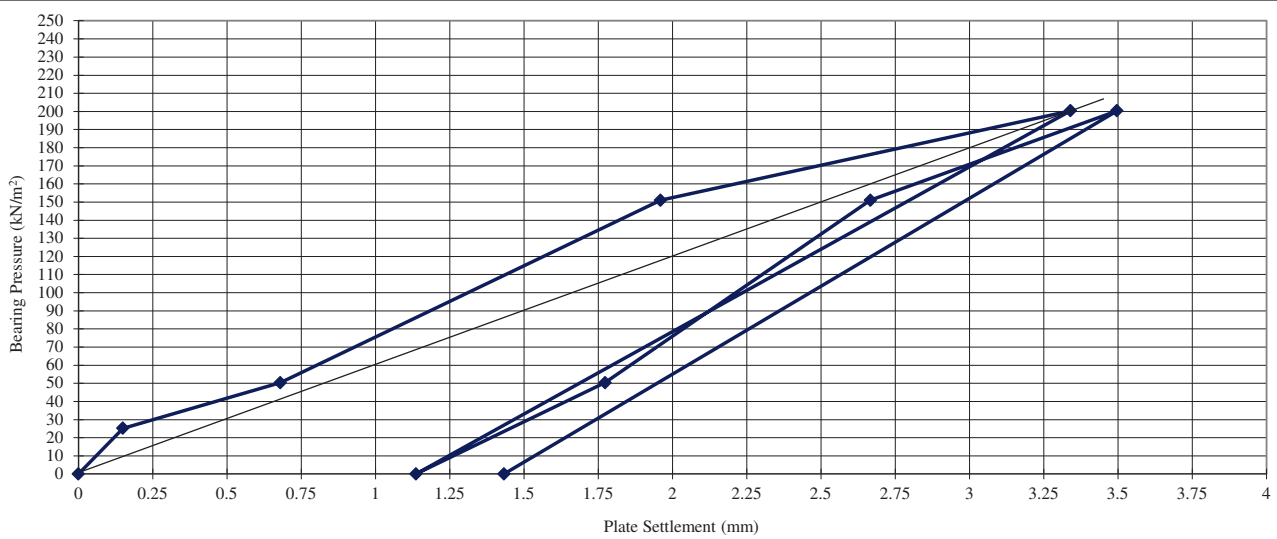


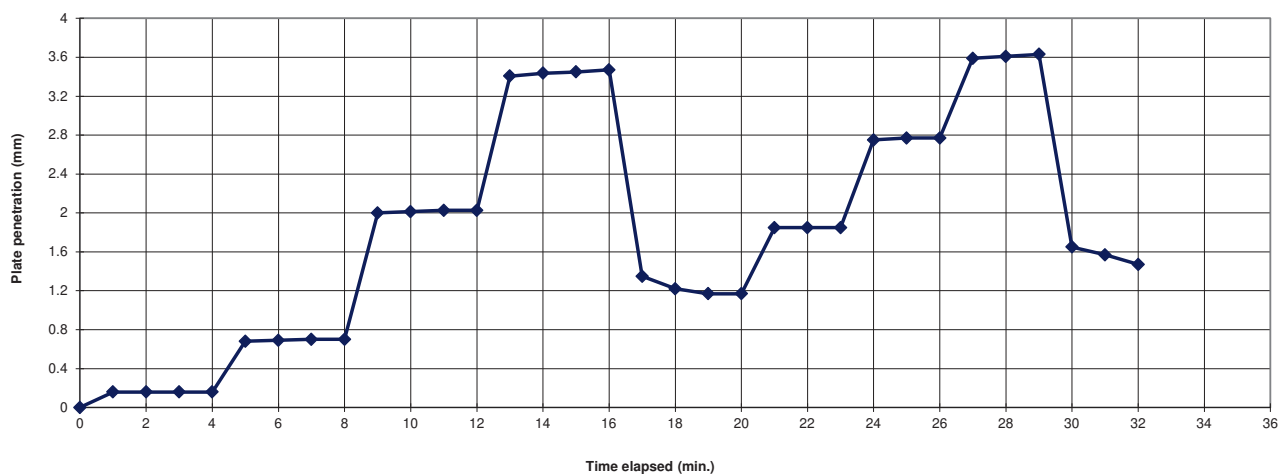
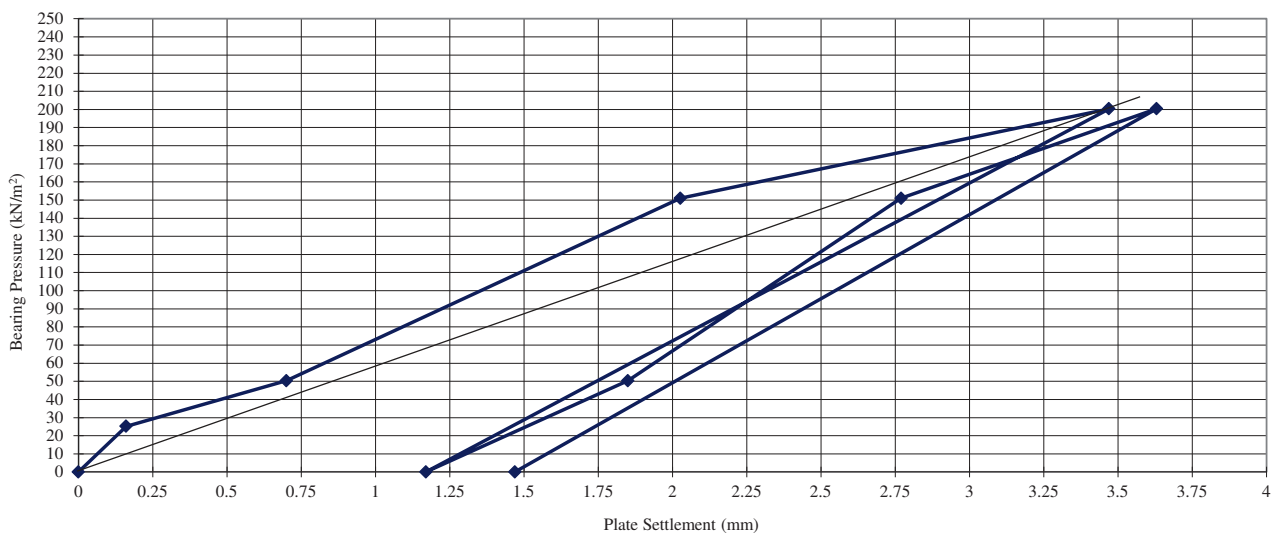
Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Client	Galway County Council	
Site	Gort Mhaolair, Athenry	
Test Date	08-Nov-24	
Location:	PT05	
Plate Diameter:		600mm
Type of reaction Load	13tonne tracked excavator	
Material Type:	slightly sandy slightly gravelly silty CLAY	
Depth test carried out:		0.50m BGL
CBR value is as per specification for 762mm Plate		

1.25mm settlement (graph) for 762mm Plate (kPa)	71
Equivalent CBR Value-Initial loading (%)	15.6
Mod. of subgrade Reaction k for 600mm Plate(kPa)	60
Correction factor for 600mm Plate	0.85

Pressure Stages	Bearing Pressure (kN/m ²)	Plate Settlement (mm)	
Initial	0.0	0.00	
	25	0.16	
	50	0.70	
	151	2.03	
	200	3.47	
	0.0	1.17	
Reload	50	1.85	
	151	2.77	
	200	3.63	
Final Condition	0.0	1.47	
ITM Co-ords	Eastings	Northing	Level

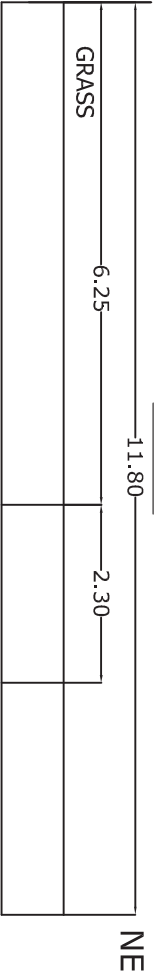


Appendix 5

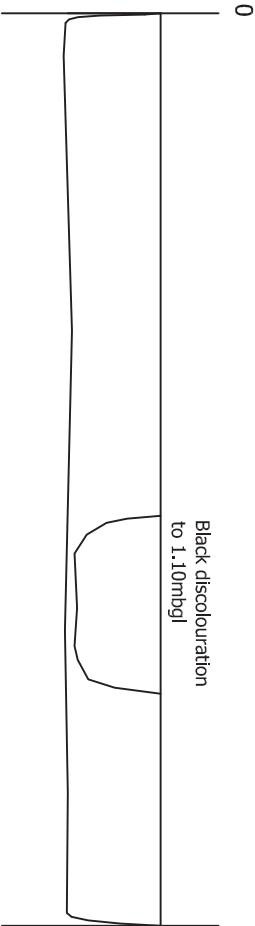
Slit Trench Log

STO1

Plan



Cross Section



Photographs



Services

No:	Diameter:	Colour:	Utility:	Distance:	Depth:	Alignment:
No services						

Ground Conditions

From:	To:	Description:
0.00m	0.20m	TOPSOIL.
0.20m	0.90m	Firm brown slightly sandy silty gravelly silty CLAY with low cobble content.
0.90m	1.20m	Firm grey slightly sandy gravelly silty CLAY with high cobble and low boulder content (up to 300mm diameter).

Trench Dimensions

Point:	Easting:	Northing:	Level:	Length:	Width:	Depth:
Start	549490.866	728076.583	45.82	11.80m	0.70m	1.20m
End	549498.902	728085.262	45.45			



SITE INVESTIGATIONS LTD

Project: Gort Mhaolir, Athenry

Client: Galway County Council

Consultant: SDS Design Engineers

Logged by: M. Kalliski

Excavation Started: 01/11/2024

Excavation Finished: 01/11/2024

CONTRACT NUMBER

Scale: NOT TO SCALE, ALL DISTANCES IN m

DEPTH ARE TO THE TOP OF SERVICES

6379

Appendix 6

Geotechnical Laboratory Test Results

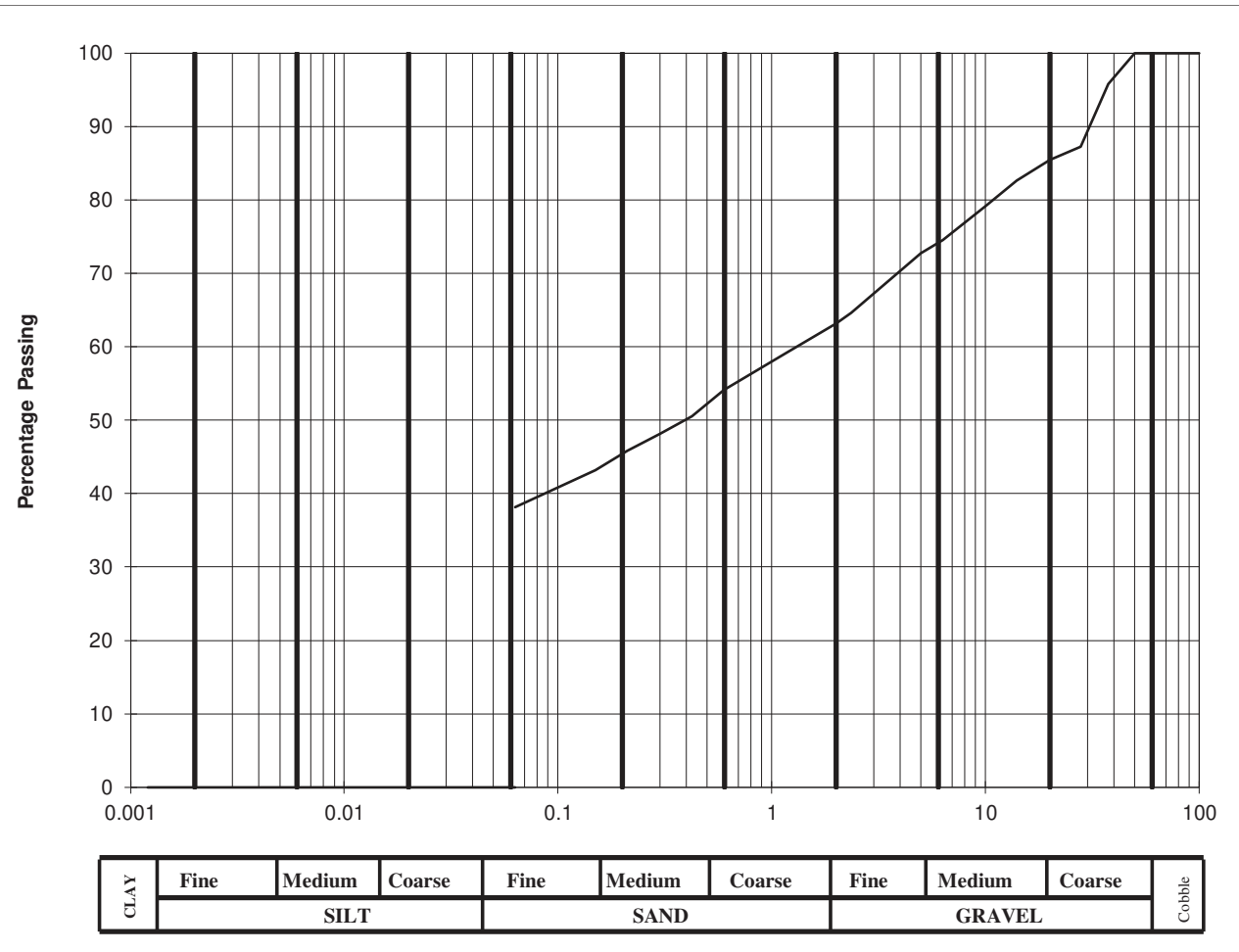
Classification Tests
In accordance with BS 1377: Part 2

Client	Galway County Council
Site	Gort Mhaoilir, Athenry
S.I. File No	6379 / 24
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	18th November 2024

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Bulk Density g/cm ³	Specific gravity	% passing 425um	Comments	Remarks C=Clay; M=Silt Plasticity: L=Low; I=Intermediate; H=High; V=Very High; E=Extremely High
TP01	1.00	MK13	24/1679	B	9.9	35	21	14			50.5		CL/CI
TP02	1.00	MK10	24/1680	B	7.5	33	20	13			47.6		CL
TP05	1.00	MK07	24/1681	B	6.3	28	19	9			35.7		CL
TP06	1.00	MK02	24/1682	B	10.0	34	21	13			52.3		CL
TP07	1.00	MK05	24/1683	B	7.9	29	20	9			44.0		CL

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	95.8		
28	87.2		
20	85.4		
14	82.6		
10	79.1		
6.3	74.5		
5.0	72.7		
2.36	64.6		
2.00	63.2		
1.18	59.2		
0.600	54.1		
0.425	50.5		
0.300	48.1		
0.212	45.8		
0.150	43.2		
0.063	38		

Cobbles, %	0
Gravel, %	37
Sand, %	25
Clay / Silt, %	38



Client :	Galway County Council
Project :	Gort Mhaolir, Athenry

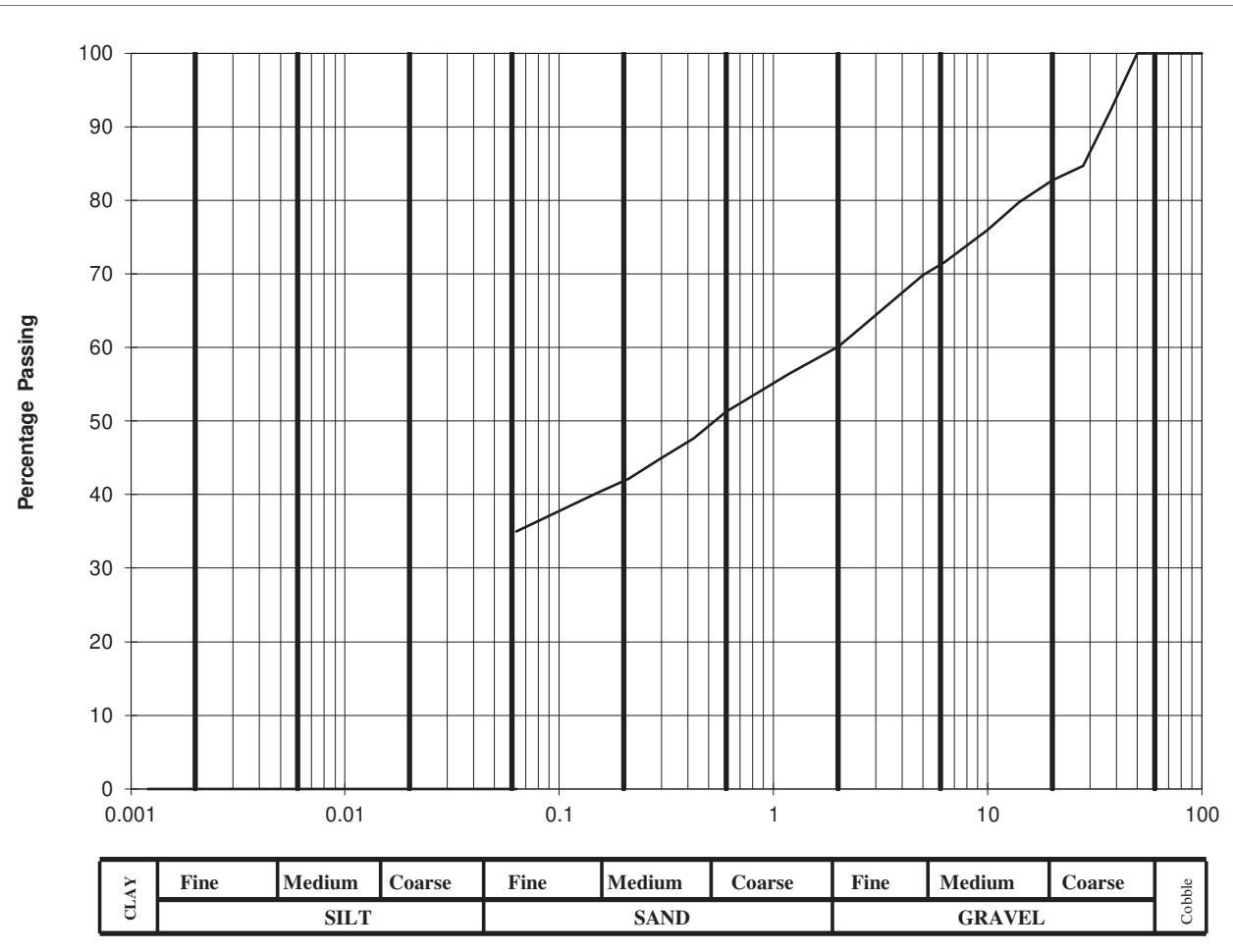
Lab. No :	24/1679
Sample No :	MK13

Hole ID :	TP 01
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	92.3		
28	84.7		
20	82.7		
14	79.7		
10	76		
6.3	71.6		
5.0	69.8		
2.36	61.8		
2.00	60.1		
1.18	56.4		
0.600	51.2		
0.425	47.6		
0.300	45		
0.212	42.2		
0.150	40.2		
0.063	35		

Cobbles, %	0
Gravel, %	40
Sand, %	25
Clay / Silt, %	35



Client :	Galway County Council
Project :	Gort Mhaolir, Athenry

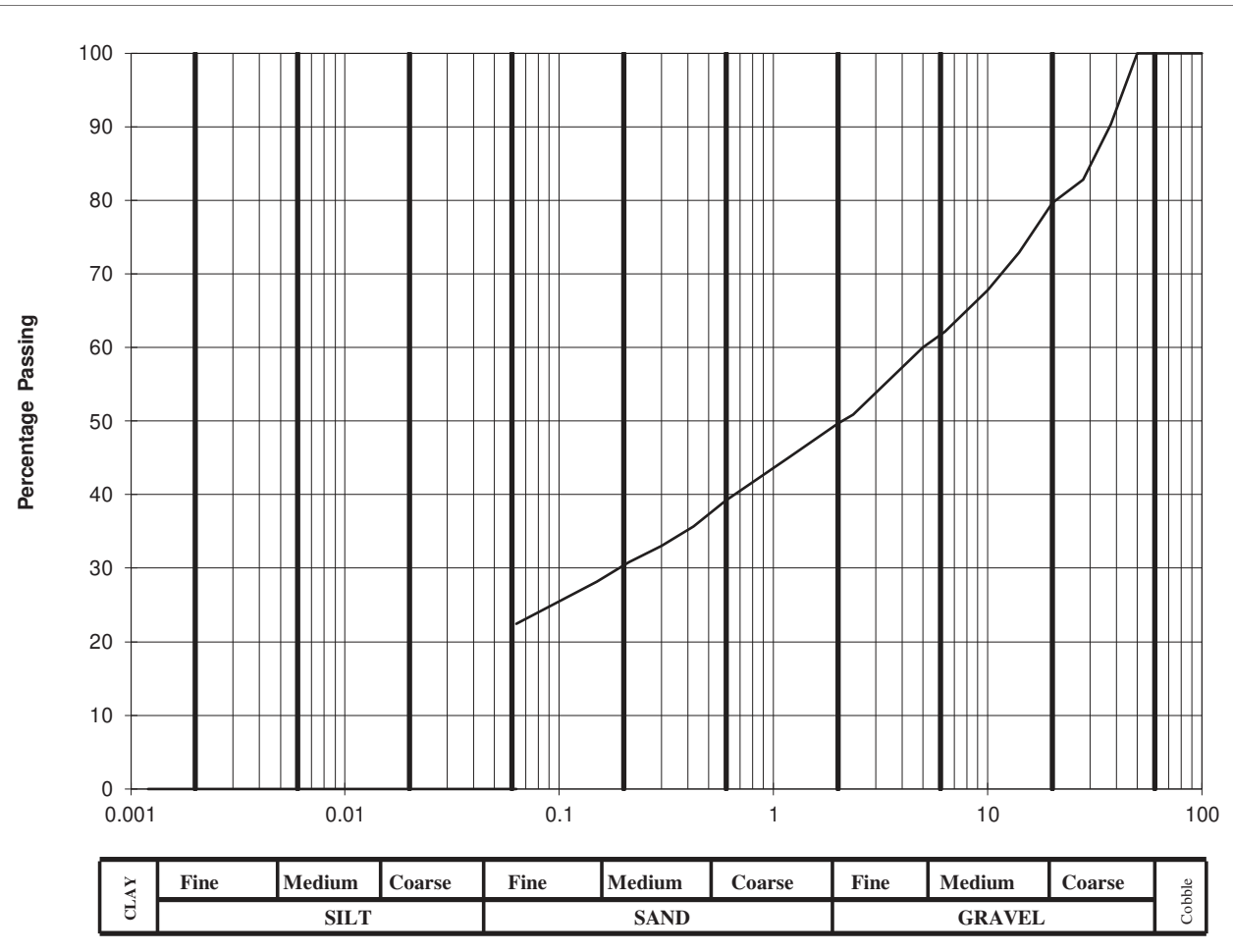
Lab. No :	24/1680
Sample No :	MK10

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	90.3		
28	82.8		
20	79.6		
14	72.9		
10	67.8		
6.3	62.1		
5.0	60		
2.36	50.9		
2.00	49.7		
1.18	45.1		
0.600	39.2		
0.425	35.7		
0.300	33		
0.212	30.8		
0.150	28.2		
0.063	23		

Cobbles, %	0
Gravel, %	50
Sand, %	27
Clay / Silt, %	23



Client :	Galway County Council
Project :	Gort Mhaolir, Athenry

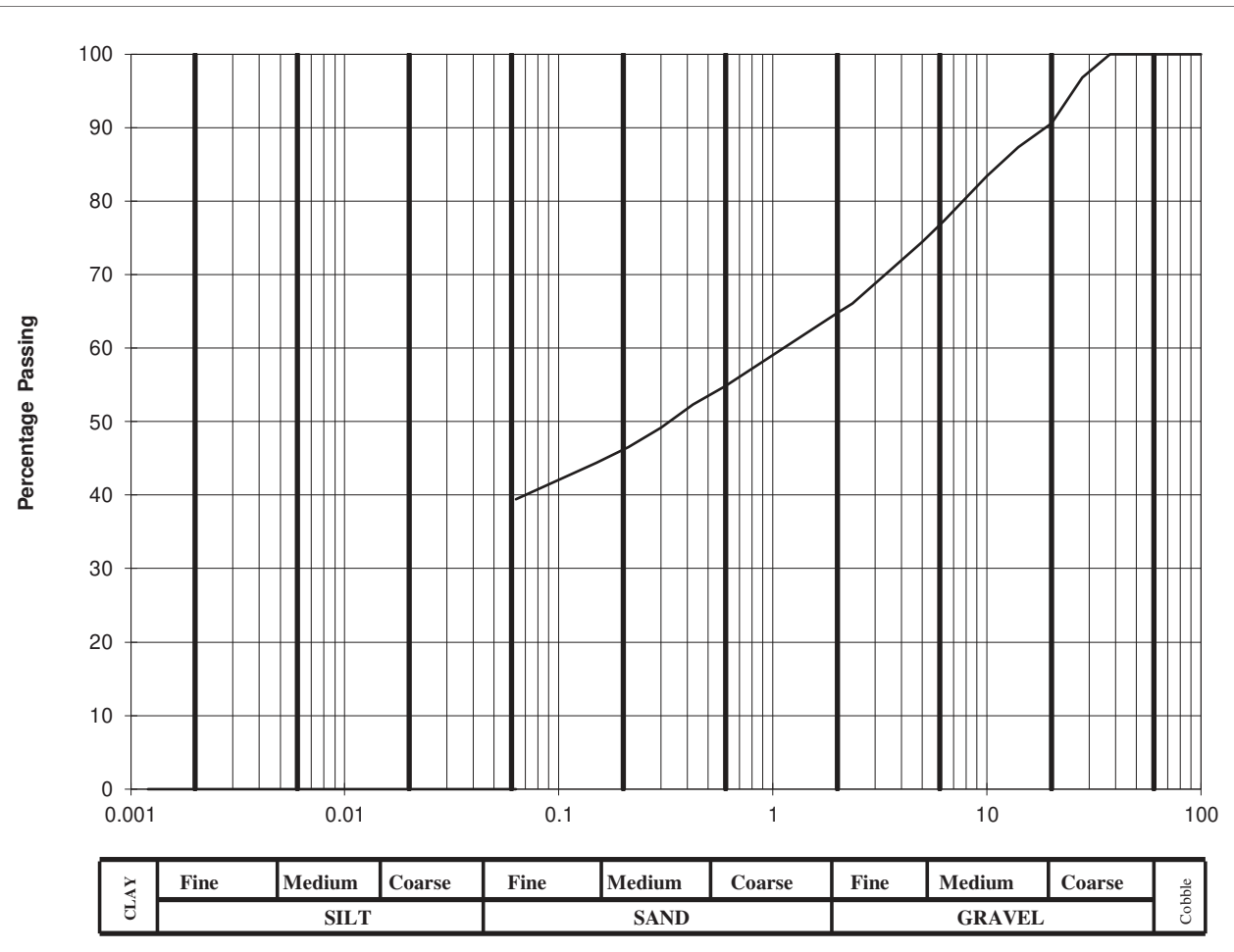
Lab. No :	24/1681
Sample No :	MK07

Hole ID :	TP 05
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	96.8		
20	90.6		
14	87.3		
10	83.4		
6.3	77.3		
5.0	74.4		
2.36	66.1		
2.00	64.8		
1.18	60.4		
0.600	54.8		
0.425	52.3		
0.300	49.2		
0.212	46.5		
0.150	44.4		
0.063	40		

Cobbles, %	0
Gravel, %	35
Sand, %	25
Clay / Silt, %	40



Client :	Galway County Council
Project :	Gort Mhaolir, Athenry

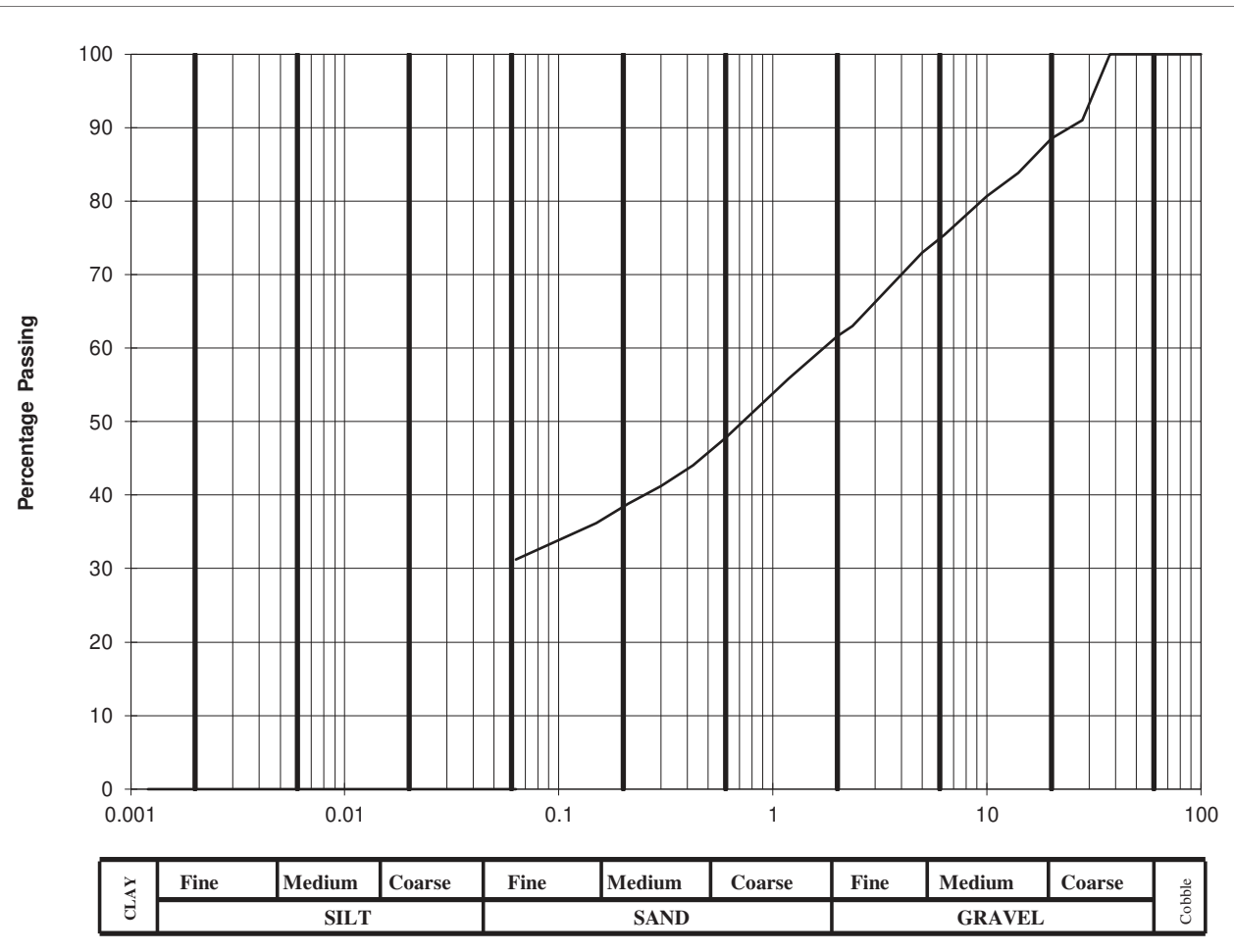
Lab. No :	24/1682
Sample No :	MK02

Hole ID :	TP 06
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	91		
20	88.5		
14	83.8		
10	80.7		
6.3	75.4		
5.0	73		
2.36	63		
2.00	61.6		
1.18	55.8		
0.600	47.7		
0.425	44		
0.300	41.2		
0.212	38.8		
0.150	36.2		
0.063	31		

Cobbles, %	0
Gravel, %	38
Sand, %	31
Clay / Silt, %	31



Client :	Galway County Council
Project :	Gort Mhaolir, Athenry

Lab. No :	24/1683
Sample No :	MK05

Hole ID :	TP 07
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

Chemical Testing
In accordance with BS 1377: Part 3

Client	Galway County Council
Site	Gort Mhaoilir, Athenry
S.I. File No	6379 / 24
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	18th November 2024

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) %	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) g/L	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm
TP01	1.00	MK13	24/1679	8.85	0.126	0.076			0.25	60.1
TP02	1.00	MK10	24/1680	8.73	0.119	0.069			0.22	63.2
TP05	1.00	MK07	24/1681	8.76	0.116	0.058			0.24	49.7
TP06	1.00	MK02	24/1682	8.72	0.124	0.081			0.21	64.8
TP07	1.00	MK05	24/1683	8.75	0.123	0.076			0.26	61.6

Appendix 7

Environmental Laboratory Test Results



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Site Investigations Ltd
The Grange
Carhugar
12th Lock Road
Lucan
Co. Dublin

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation:	19 November 2024
Customer:	Site Investigations Ltd
Sample Delivery Group (SDG):	241108-121
Your Reference:	6379
Location:	Gort Mhaolair, Athenry, G. Galway
Report No:	747092
Order Number:	40/B/24

We received 5 samples on Friday November 08, 2024 and 5 of these samples were scheduled for analysis which was completed on Tuesday November 19, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Lauren Ellis

General Manager Western Europe Environmental





CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
30638262	ST 01		0.40 - 0.40	05/11/2024
30638257	TH 01		0.50 - 0.50	05/11/2024
30638258	TH 02		0.50 - 0.50	05/11/2024
30638259	TH 06		0.50 - 0.50	05/11/2024
30638261	TH 07		0.50 - 0.50	05/11/2024

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092

Superseded Report:

Location: Gort Mhaolair, Athenry, G. Galway

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		30638262	30638257	30638258	30638259	30638261
	Customer Sample Reference		ST 01	TH 01	TH 02	TH 06	TH 07
	AGS Reference						
	Depth (m)		0.40 - 0.40	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
	Container		1 kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1 kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 5	X	X	X	X	X
CEN Readings	All	NDPs: 0 Tests: 5	X	X	X	X	X
Chromium III	All	NDPs: 0 Tests: 5	X	X	X	X	X
Coronene	All	NDPs: 0 Tests: 5	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5	X	X	X	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 5	X	X	X	X	X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 5	X	X	X	X	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 5	X	X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 5	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 5	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 5	X	X	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 5	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092

Superseded Report:

Location: Gort Mhaolair, Athenry, G. Galway

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		30638262	30638257	30638258	30638259	30638261
	Customer Sample Reference		ST 01	TH 01	TH 02	TH 06	TH 07
Sample Types -	AGS Reference						
	Depth (m)		0.40 - 0.40	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
Sample Types -	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S
PAH by GCMS	All	NDPs: 0 Tests: 5	X	X	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 5	X	X	X	X	X
pH	All	NDPs: 0 Tests: 5	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 5	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 5	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 5	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
30638262	ST 01	0.40 - 0.40	Dark Brown	Silt Loam	Vegetation	Oil/Petroleum
30638257	TH 01	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation
30638258	TH 02	0.50 - 0.50	Light Brown	Loamy Sand	Stones	None
30638259	TH 06	0.50 - 0.50	Light Brown	Sandy Clay Loam	Stones	Vegetation
30638261	TH 07	0.50 - 0.50	Light Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Results Legend			Customer Sample Ref.		ST 01	TH 01	TH 02	TH 06	TH 07	
# ISO17025 accredited.	M mCERTS accredited.	aq Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.40 - 0.40 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	
diss.filt Dissolved / filtered sample.	tot.unfiltTotal / unfiltered sample.	* Subcontracted - refer to subcontractor report for accreditation status.			08/11/2024 241108-121 30638262	08/11/2024 241108-121 30638257	08/11/2024 241108-121 30638258	08/11/2024 241108-121 30638259	08/11/2024 241108-121 30638261	
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	(F) Trigger breach confirmed	1-4* Sample deviation (see appendix)								
Component	LOD/Units	Method								
Moisture Content Ratio (% of as received sample)	%	PM024			33	13	3.4	12	9	
Loss on ignition	<0.7 %	TM018			5.14	2.22	<0.7	1.19	0.885	
Organic Carbon, Total	<0.2 %	TM132			M	M	M	M	M	
pH	1 pH Units	TM133			1.93	0.748	2.38	0.59	0.209	
Chromium, Hexavalent	<0.6 mg/kg	TM151			M	M	M	M	M	
PCB congener 28	<3 µg/kg	TM168			<0.6	<0.6	<0.6	<0.6	<0.6	
PCB congener 52	<3 µg/kg	TM168			M	M	M	M	M	
PCB congener 101	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 118	<3 µg/kg	TM168			M	M	M	M	M	
PCB congener 138	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 153	<3 µg/kg	TM168			M	M	M	M	M	
PCB congener 180	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168			M	M	M	M	M	
Chromium, Trivalent	<0.9 mg/kg	TM181			<21	<21	<21	<21	<21	
Antimony	<0.6 mg/kg	TM181			15.9	6.81	3.86	7.2	5.02	
Arsenic	<0.6 mg/kg	TM181			<0.6	<0.6	<0.6	<0.6	<0.6	
Barium	<0.6 mg/kg	TM181			#	#	#	#	#	
Cadmium	<0.02 mg/kg	TM181			3.29	2.82	1.13	2.88	2.27	
Chromium	<0.9 mg/kg	TM181			M	M	M	M	M	
Copper	<1.4 mg/kg	TM181			37.7	18.5	7.36	20.7	13.7	
Lead	<0.7 mg/kg	TM181			#	#	#	#	#	
Mercury	<0.1 mg/kg	TM181			0.382	0.687	0.277	0.75	0.606	
Molybdenum	<0.1 mg/kg	TM181			M	M	M	M	M	
Nickel	<0.2 mg/kg	TM181			15.9	6.81	3.86	7.2	5.02	
Selenium	<1 mg/kg	TM181			M	M	M	M	M	
Zinc	<1.9 mg/kg	TM181			72.9	5.18	<1.4	6.21	3.78	
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410			M	M	M	M	M	
Coronene	<200 µg/kg	TM410			17.4	5.59	1.03	4.61	3.1	
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415			<0.1	<0.1	<0.1	<0.1	<0.1	
					M	M	M	M	M	
					0.616	0.472	0.315	0.596	0.347	
					#	#	#	#	#	
					18.9	10.7	3.89	12.3	8.2	
					M	M	M	M	M	
					1.41	<1	<1	<1	<1	
					#	#	#	#	#	
					98.5	21.1	4.42	22.7	13.5	
					M	M	M	M	M	
					<10	<10	<10	<10	<10	
					<200	<200	<200	<200	<200	
					<5	<5	<5	<5	<5	



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092

Superseded Report:

Location: Gort Mhaolair, Athenry, G. Galway

TPH CWG (S)

Results Legend			Customer Sample Ref.		ST 01	TH 01	TH 02	TH 06	TH 07	
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4\$@Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.40 - 0.40 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	0.50 - 0.50 Soil/Solid (S) 05/11/2024	
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM089			87.5	97.1	93.9	97.6	97.7	
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414			<1000	<1000	<1000	<1000	<1000	
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414			<1000	<1000	<1000	<1000	<1000	
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414			4390	<1000	<1000	<1000	<1000	
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414			33200	<1000	<1000	<1000	<1000	
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414			2030	<1000	<1000	<1000	<1000	
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414			39600	<5000	<5000	<5000	<5000	
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414			87900	<10000	<10000	<10000	<10000	
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089			<10	<10	<10	<10	<10	
Aromatics >EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414			<1000	<1000	<1000	<1000	<1000	
Aromatics >EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414			<1000	<1000	<1000	<1000	<1000	
Aromatics >EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414			5810	<1000	<1000	<1000	<1000	
Aromatics >EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414			39200	1850	<1000	1300	<1000	
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414			3270	<1000	<1000	<1000	<1000	
Aromatics >EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414			<1000	<1000	<1000	<1000	<1000	
Total Aromatics >EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414			48300	<5000	<5000	<5000	<5000	
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414			87900	<10000	<10000	<10000	<10000	
GRO >C5-C6 (HS_1D)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	
GRO >C6-C7 (HS_1D)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	
GRO >C7-C8 (HS_1D)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	
GRO >C8-C10 (HS_1D)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	
GRO >C10-C12 (HS_1D)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089			<50	<50	<50	<50	<50	
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089			<50	<50	<50	<50	<50	
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089			<20	<20	<20	<20	<20	



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.103
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Gort Mhaolair, Athenry, G. Galway
Natural Moisture Content (%)	14.7
Dry Matter Content (%)	87.2

Case	
SDG	241108-121
Lab Sample Number(s)	30638257
Sampled Date	05-Nov-2024
Customer Sample Ref.	TH 01
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.748
Loss on Ignition (%)	2.22
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.57
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00282	<0.0002	0.0282	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00217	<0.0003	0.0217	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000445	<0.0004	0.00445	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.672	<0.5	6.72	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	72.7	<10	727	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.67	<3	46.7	<30	500	800	1000

Leach Test Information

Date Prepared	09-Nov-2024
pH (pH Units)	8.73
Conductivity (µS/cm)	95
Volume Leachant (Litres)	0.887

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

19/11/2024 12:06:46

12:06:39 19/11/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.096
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Gort Mhaolair, Athenry, G. Galw
Natural Moisture Content (%)	6.77
Dry Matter Content (%)	93.7

Case	
SDG	241108-121
Lab Sample Number(s)	30638258
Sampled Date	05-Nov-2024
Customer Sample Ref.	TH 02
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	2.38
Loss on Ignition (%)	<0.7
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	9.04
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00156	<0.0002	0.0156	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00074	<0.0003	0.0074	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00334	<0.001	0.0334	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	35.4	<10	354	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	09-Nov-2024
pH (pH Units)	9.56
Conductivity (µS/cm)	46
Volume Leachant (Litres)	0.894

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

19/11/2024 12:06:46

12:06:39 19/11/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.102
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Gort Mhaolair, Athenry, G. Galway
Natural Moisture Content (%)	13.8
Dry Matter Content (%)	87.8

Case	
SDG	241108-121
Lab Sample Number(s)	30638259
Sampled Date	05-Nov-2024
Customer Sample Ref.	TH 06
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.59
Loss on Ignition (%)	1.19
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.14
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.0009	<0.0005	0.009	<0.005	0.5	2	25
Barium	0.00222	<0.0002	0.0222	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00258	<0.0003	0.0258	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000464	<0.0004	0.00464	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	14.5	<2	145	<20	1000	20000	50000
Total Dissolved Solids	89.5	<10	895	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	09-Nov-2024
pH (pH Units)	8.79
Conductivity (µS/cm)	117
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

19/11/2024 12:06:46

12:06:39 19/11/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.099
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Gort Mhaolair, Athenry, G. Galway
Natural Moisture Content (%)	9.99
Dry Matter Content (%)	90.9

Case	
SDG	241108-121
Lab Sample Number(s)	30638261
Sampled Date	05-Nov-2024
Customer Sample Ref.	TH 07
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.209
Loss on Ignition (%)	0.885
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.73
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00145	<0.0002	0.0145	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00222	<0.0003	0.0222	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000732	<0.0004	0.00732	<0.004	0.4	10	40
Lead	0.000233	<0.0002	0.00233	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00469	<0.001	0.0469	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	48.9	<10	489	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.26	<3	42.6	<30	500	800	1000

Leach Test Information

Date Prepared	09-Nov-2024
pH (pH Units)	9.19
Conductivity (µS/cm)	64
Volume Leachant (Litres)	0.891

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

19/11/2024 12:06:46

12:06:39 19/11/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.152

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Gort Mhaolair, Athenry, G. Galw

Natural Moisture Content (%) 70.2

Dry Matter Content (%) 58.8

Case

SDG 241108-121

Lab Sample Number(s) 30638262

Sampled Date 05-Nov-2024

Customer Sample Ref. ST 01

Depth (m) 0.40 - 0.40

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis

Result

Total Organic Carbon (%) 1.93

Loss on Ignition (%) 5.14

Sum of BTEX (mg/kg) -

Sum of 7 PCBs (mg/kg) <0.021

Mineral Oil (mg/kg) (EH_2D_AL) 35

PAH Sum of 17 (mg/kg) <10

pH (pH Units) 6.47

ANC to pH 6 (mol/kg) -

ANC to pH 4 (mol/kg) -

Eluate Analysis

C₂ Concⁿ in 10:1 eluate (mg/l)A₂ 10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00322	<0.0005	0.0322	<0.005	0.5	2	25
Barium	0.0118	<0.0002	0.118	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00464	<0.0003	0.0464	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00664	<0.003	0.0664	<0.03	0.5	10	30
Nickel	0.00544	<0.0004	0.0544	<0.004	0.4	10	40
Lead	0.000677	<0.0002	0.00677	<0.002	0.5	10	50
Antimony	0.0016	<0.001	0.016	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0455	<0.001	0.455	<0.01	4	50	200
Chloride	2.3	<2	23	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	210	<2	2100	<20	1000	20000	50000
Total Dissolved Solids	351	<10	3510	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	11.4	<3	114	<30	500	800	1000

Leach Test Information

Date Prepared 09-Nov-2024

pH (pH Units) 6.01

Conductivity (µS/cm) 458

Volume Leachant (Litres) 0.837

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

19/11/2024 12:06:46

12:06:39 19/11/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Table of Results - Appendix

Method No	Description
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM218	The determination of PAH in soil samples by GC-MS
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 241108-121
Client Ref.: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Test Completion Dates

Lab Sample No(s)	30638262	30638257	30638258	30638259	30638261
Customer Sample Ref.	ST 01	TH 01	TH 02	TH 06	TH 07
AGS Ref.					
Depth	0.40 - 0.40	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
CEN 10:1 Leachate (1 Stage)	11-Nov-2024	11-Nov-2024	11-Nov-2024	11-Nov-2024	11-Nov-2024
CEN Readings	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024
Chromium III	14-Nov-2024	14-Nov-2024	15-Nov-2024	14-Nov-2024	14-Nov-2024
Coronene	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
Dissolved Metals by ICP-MS	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024
Dissolved Organic/Inorganic Carbon	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
EPH by GCxGC-FID	15-Nov-2024	14-Nov-2024	15-Nov-2024	14-Nov-2024	15-Nov-2024
EPH CWG GC (S)	15-Nov-2024	15-Nov-2024	13-Nov-2024	15-Nov-2024	15-Nov-2024
Fluoride	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
GRO by GC-FID (S)	12-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
Hexavalent Chromium (s)	14-Nov-2024	14-Nov-2024	15-Nov-2024	14-Nov-2024	14-Nov-2024
Loss on Ignition in soils	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
Mercury Dissolved	14-Nov-2024	15-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
Metals in solid samples by OES	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024
Moisture at 105C	09-Nov-2024	09-Nov-2024	09-Nov-2024	09-Nov-2024	09-Nov-2024
PAH 16 & 17 Calc	18-Nov-2024	18-Nov-2024	18-Nov-2024	18-Nov-2024	18-Nov-2024
PAH by GCMS	18-Nov-2024	18-Nov-2024	18-Nov-2024	18-Nov-2024	18-Nov-2024
PCBs by GCMS	19-Nov-2024	19-Nov-2024	19-Nov-2024	19-Nov-2024	19-Nov-2024
pH	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
pH Value of Filtered Water	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024	14-Nov-2024
Phenols by HPLC (W)	14-Nov-2024	14-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
Sample description	09-Nov-2024	09-Nov-2024	09-Nov-2024	09-Nov-2024	09-Nov-2024
Total Organic Carbon	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024	13-Nov-2024
TPH CWG GC (S)	15-Nov-2024	15-Nov-2024	13-Nov-2024	15-Nov-2024	15-Nov-2024
VOC MS (S)	13-Nov-2024	12-Nov-2024	12-Nov-2024	12-Nov-2024	14-Nov-2024



CERTIFICATE OF ANALYSIS

SDG: 241108-121
Client Ref: 6379

Report Number: 747092
Location: Gort Mhaolair, Athenry, G. Galway

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix 8

Waste Classification Report



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



1HCVL-F5W1A-XX4NN

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Report is invalid if pages are removed.

Job name

6379

Description/Comments

Client: Galway County Council
Engineer: SDS Design Engineers

Project

Gort Mhaoilir

Site

Athenry, Co. Galway

Classified by

Name:	Company:
Stephen Letch	Site Investigations Ltd
Date:	The Grange
03 Dec 2024 10:39 GMT	12th Lock Road
Telephone:	Lucan
00353 86817 9449	K78 F598

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification
Most recent 3 year Refresher

Date

09 Oct 2019
04 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Gort Mhaoilir, Athenry, Co. Galway

Post Code N/A

SIC for the process giving rise to the waste

43130 Test drilling and boring

Description of industry/producer giving rise to the waste

Site Investigation

Description of the specific process, sub-process and/or activity that created the waste

Soils recovered for environmental testing

Description of the waste

Natural soils



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	ST01-0.40	0.40	Non Hazardous		Fail	Pass	3
2	TP01-0.50	0.50	Non Hazardous		Pass	Pass	7
3	TP02-0.50	0.50	Non Hazardous		Pass	Pass	11
4	TP06-0.50	0.50	Non Hazardous		Pass	Pass	15
5	TP07-0.50	0.50	Non Hazardous		Pass	Pass	19

Related documents

#	Name	Description
1	241108-121.hwol	ALS Hawarden .hwol file used to populate the Job
2	Rilta Suite NEW	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Letch

Created date: 03 Dec 2024 10:39 GMT

Appendices	Page
Appendix A: Classifier defined and non EU CLP determinands	23
Appendix B: Rationale for selection of metal species	24
Appendix C: Version	25



Classification of sample: ST01-0.40

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
ST01-0.40	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
33%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 33% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				87.9 mg/kg		58.893 mg/kg	0.00589 %	✓	
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				☑					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				3.29 mg/kg	1.534	3.381 mg/kg	0.000338 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				37.7 mg/kg	1.233	31.157 mg/kg	0.00312 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				0.382 mg/kg	1.855	0.475 mg/kg	0.0000475 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				72.9 mg/kg	1.126	54.992 mg/kg	0.0055 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17.4 mg/kg		11.658 mg/kg	0.00117 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.616 mg/kg	1.5	0.619 mg/kg	0.0000619 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				18.9 mg/kg	2.637	33.388 mg/kg	0.00334 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.41 mg/kg	1.405	1.327 mg/kg	0.000133 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				98.5 mg/kg	2.469	162.961 mg/kg	0.0163 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15.9 mg/kg	1.462	15.57 mg/kg	0.00156 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene	201-581-5	85-01-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene	205-912-4	206-44-0		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene	204-927-3	129-00-0		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.0015 mg/kg		<0.0015 mg/kg	<0.00000015 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
37	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	pH		PH		6.47 pH		6.47 pH	6.47 pH		
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
Total:								0.0377 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%)
because: HP 3 can be discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00589%)



WAC results for sample: ST01-0.40

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.93	3	5
2	LOI (loss on ignition)	%	5.14	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.0075	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	35	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	6.47	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0322	0.5	2
10	barium	mg/kg	0.118	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0464	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.0664	0.5	10
16	nickel	mg/kg	0.0544	0.4	10
17	lead	mg/kg	0.0067	0.5	10
18	antimony	mg/kg	0.016	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.455	4	50
21	chloride	mg/kg	23	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	2100	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	114	500	800
26	TDS (total dissolved solids)	mg/kg	3510	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail



Classification of sample: TP01-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01-0.50	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH								
2	confirm TPH has NOT arisen from diesel or petrol				☒						
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718	mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4								
4	arsenic { arsenic pentoxide }				2.82 mg/kg	1.534	3.763	mg/kg	0.000376 %	✓	
	033-004-00-6	215-116-9	1303-28-2								
5	barium { barium sulphide }				18.5 mg/kg	1.233	19.853	mg/kg	0.00199 %	✓	
	016-002-00-X	244-214-4	21109-95-5								
6	cadmium { cadmium sulfate }				0.687 mg/kg	1.855	1.108	mg/kg	0.000111 %	✓	
	048-009-00-9	233-331-6	10124-36-4								
7	copper { dicopper oxide; copper (I) oxide }				5.18 mg/kg	1.126	5.074	mg/kg	0.000507 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	5.59 mg/kg		4.863	mg/kg	0.000486 %	✓	
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	molybdenum { molybdenum(VI) oxide }				0.472 mg/kg	1.5	0.616	mg/kg	0.0000616 %	✓	
	042-001-00-9	215-204-7	1313-27-5								
11	nickel { nickel sulfate }				10.7 mg/kg	2.637	24.545	mg/kg	0.00245 %	✓	
	028-009-00-5	232-104-9	7786-81-4								
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
13	zinc { zinc sulphate }				21.1 mg/kg	2.469	45.329	mg/kg	0.00453 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				6.81 mg/kg	1.462	8.659	mg/kg	0.000866 %	✓	
		215-160-9	1308-38-9								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene	201-581-5	85-01-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene	205-912-4	206-44-0		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene	204-927-3	129-00-0		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
37	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	pH		PH		8.57 pH		8.57 pH	8.57 pH		
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
Total:								0.0128 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP01-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.748	3	5
2	LOI (loss on ignition)	%	2.22	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.57	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0282	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0217	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0044	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	<0.01	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	6.72	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	46.7	500	800
26	TDS (total dissolved solids)	mg/kg	727	4,000	60,000

Key

User supplied data



Classification of sample: TP02-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP02-0.50	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
3.4% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 3.4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				☒					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				1.13 mg/kg	1.534	1.674 mg/kg	0.000167 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				7.36 mg/kg	1.233	8.77 mg/kg	0.000877 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				0.277 mg/kg	1.855	0.496 mg/kg	0.0000496 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				<1.4 mg/kg	1.126	<1.576 mg/kg	<0.000158 %		<LOD
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	1.03 mg/kg		0.995 mg/kg	0.0000995 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.315 mg/kg	1.5	0.456 mg/kg	0.0000456 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				3.89 mg/kg	2.637	9.908 mg/kg	0.000991 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
13	zinc { zinc sulphate }				4.42 mg/kg	2.469	10.543 mg/kg	0.00105 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				3.86 mg/kg	1.462	5.45 mg/kg	0.000545 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene	201-581-5	85-01-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene	205-912-4	206-44-0		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene	204-927-3	129-00-0		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
37	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	pH		PH		9.04 pH		9.04 pH	9.04 pH		
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
Total:								0.00537 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP02-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	2.38	3	5
2	LOI (loss on ignition)	%	<0.7	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	9.04	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0156	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0074	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	<0.004	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0334	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	<30	500	800
26	TDS (total dissolved solids)	mg/kg	354	4,000	60,000

Key

User supplied data



Classification of sample: TP06-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP06-0.50	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				☑					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				2.88 mg/kg	1.534	3.887 mg/kg	0.000389 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				20.7 mg/kg	1.233	22.469 mg/kg	0.00225 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				0.75 mg/kg	1.855	1.224 mg/kg	0.000122 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				6.21 mg/kg	1.126	6.153 mg/kg	0.000615 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	4.61 mg/kg		4.057 mg/kg	0.000406 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.596 mg/kg	1.5	0.787 mg/kg	0.0000787 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				12.3 mg/kg	2.637	28.539 mg/kg	0.00285 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
13	zinc { zinc sulphate }				22.7 mg/kg	2.469	49.327 mg/kg	0.00493 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.2 mg/kg	1.462	9.26 mg/kg	0.000926 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene	201-581-5	85-01-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene	205-912-4	206-44-0		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene	204-927-3	129-00-0		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
37	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	pH		PH		8.14 pH		8.14 pH	8.14 pH		
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
Total:								0.014 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP06-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.59	3	5
2	LOI (loss on ignition)	%	1.19	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.14	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.009	0.5	2
10	barium	mg/kg	0.0222	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0258	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0046	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	<0.01	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	145	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	<30	500	800
26	TDS (total dissolved solids)	mg/kg	895	4,000	60,000

Key

User supplied data



Classification of sample: TP07-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP07-0.50	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				☒					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				2.27 mg/kg	1.534	3.169 mg/kg	0.000317 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				13.7 mg/kg	1.233	15.378 mg/kg	0.00154 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				0.606 mg/kg	1.855	1.023 mg/kg	0.000102 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				3.78 mg/kg	1.126	3.873 mg/kg	0.000387 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	3.1 mg/kg		2.821 mg/kg	0.000282 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.347 mg/kg	1.5	0.474 mg/kg	0.0000474 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				8.2 mg/kg	2.637	19.675 mg/kg	0.00197 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
13	zinc { zinc sulphate }				13.5 mg/kg	2.469	30.335 mg/kg	0.00303 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				5.02 mg/kg	1.462	6.677 mg/kg	0.000668 %	✓	
		215-160-9	1308-38-9							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene	201-581-5	85-01-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene	205-912-4	206-44-0		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene	204-927-3	129-00-0		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
37	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	pH		PH		8.73 pH		8.73 pH	8.73 pH		
39	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
Total:								0.00973 %		



Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



WAC results for sample: TP07-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.209	3	5
2	LOI (loss on ignition)	%	0.885	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.014	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.73	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0145	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0222	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0073	0.4	10
17	lead	mg/kg	0.0023	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0469	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	42.6	500	800
26	TDS (total dissolved solids)	mg/kg	489	4,000	60,000

Key

User supplied data



Appendix A: Classifier defined and non EU CLP determinands

• **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

• **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• **barium sulphide** (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X

Description/Comments:

Additional Hazard Statement(s): EUH031 >= 0.8 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

• **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

EU CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315



• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case scenario.

arsenic {arsenic pentoxide}

Arsenic pentoxide used as most hazardous species.



barium {barium sulphide}

Chromium VI at limits of detection. Barium sulphide used as the next most hazardous species. No chromate present.

cadmium {cadmium sulfate}

Cadmium sulphate used as the most hazardous species.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel sulfate}

Chromium VI at limits of detection. Nickel sulphate used as the next most hazardous species. No chromate present.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc sulphate}

Chromium VI at limits of detection. Zinc sulphate used as the next most hazardous species. No chromate present.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021

HazWasteOnline Classification Engine Version: 2024.332.6362.11667 (27 Nov 2024)

HazWasteOnline Database: 2024.331.6361.11659 (26 Nov 2024)



This classification utilises the following guidance and legislation:

WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

17th ATP - Regulation (EU) 2021/849 of 11 March 2021

18th ATP - Regulation (EU) 2022/692 of 16 February 2022

19th ATP - Regulation (EU) 2023/1434 of 25 April 2023

20th ATP - Regulation (EU) 2023/1435 of 2 May 2023

21st ATP - Regulation (EU) 2024/197 of 19 October 2023

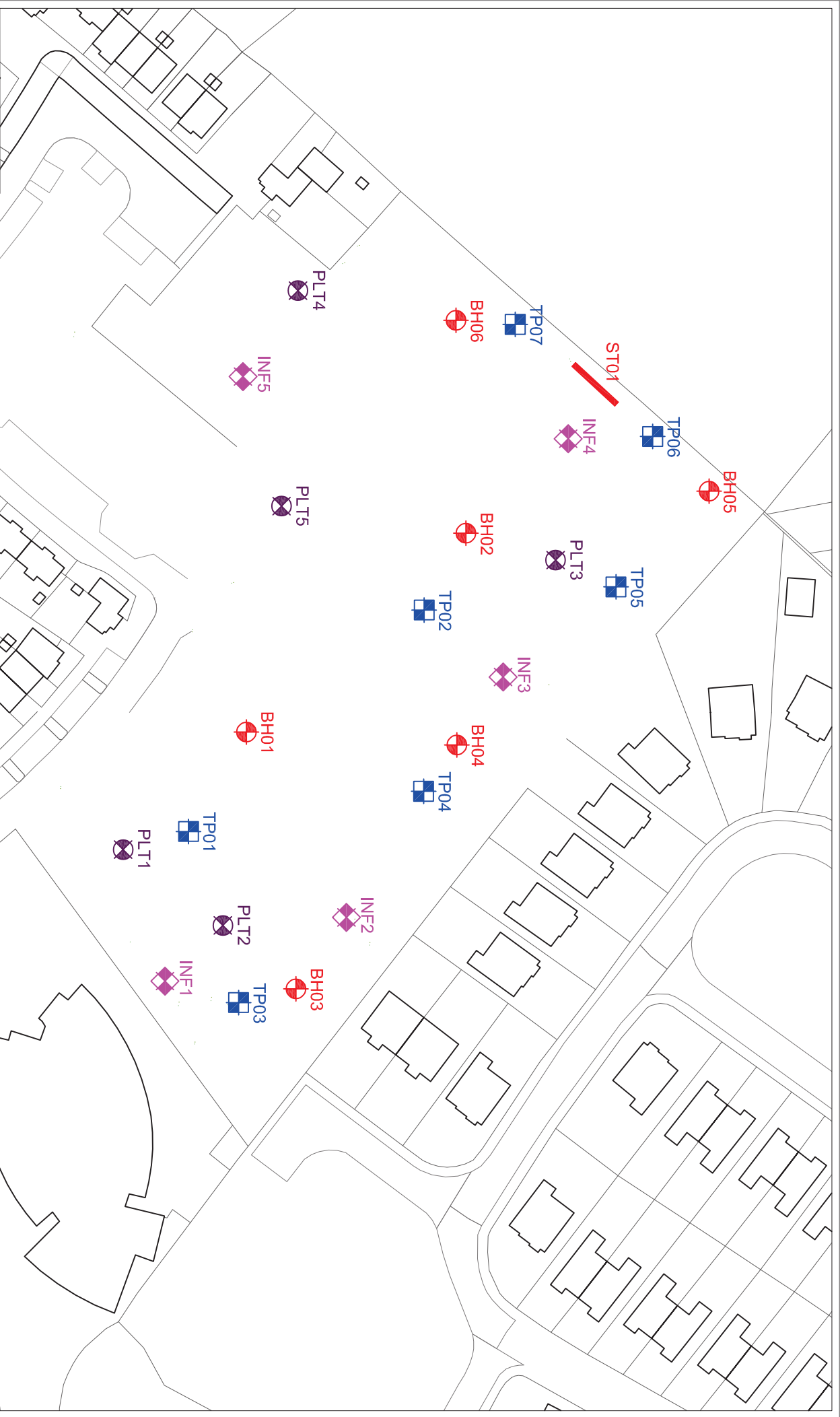
22nd ATP - Regulation (EU) 2024/2564 of 19th June 2024

Appendix 9

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Cable Percussive Boreholes					
BH01	549565.680	728009.940	45.53	149604.026	227981.472
BH02	549525.171	728054.603	45.64	149563.508	228026.144
BH03	549617.943	728020.002	45.53	149656.300	227991.536
BH04	549568.282	728052.783	46.35	149606.628	228024.324
BH05	549516.648	728104.100	45.02	149554.983	228075.652
BH06	549481.870	728052.619	46.08	149520.198	228024.159
Trial Pits					
TP01	549585.917	727998.146	45.23	149624.267	227969.675
TP02	549540.830	728046.118	45.88	149579.171	228017.657
TP03	549620.731	728008.343	45.26	149659.089	227979.875
TP04	549577.720	728046.005	46.13	149616.069	228017.545
TP05	549536.109	728085.166	45.67	149574.448	228056.714
TP06	549505.510	728092.634	45.28	149543.843	228064.183
TP07	549482.689	728064.657	46.04	149521.017	228036.200
Soakaway Tests					
INF1	549616.363	727993.351	44.44	149654.720	227964.879
INF2	549603.389	728030.301	45.47	149641.743	228001.837
INF3	549554.464	728062.189	46.68	149592.807	228033.732
INF4	549505.957	728075.441	45.39	149544.290	228046.987
INF5	549493.302	728009.237	45.28	149531.632	227980.768
Plate Tests					
PLT1	549589.592	727984.839	45.12	149627.943	227956.366
PLT2	549605.036	728005.136	45.16	149643.391	227976.667
PLT3	549530.660	728072.878	45.83	149568.998	228044.423
PLT4	549475.823	728020.429	44.67	149514.150	227991.963
PLT5	549519.675	728017.080	45.44	149558.011	227988.613
Slit Trenches					
ST01 Start	549490.866	728076.583	45.82	149529.196	228048.129
ST01 End	549498.902	728085.262	45.45	149537.233	228056.810



Site Investigations Ltd
The Grange
12th Lock Road
Lucan
Co. Dublin
T: 01 6108768
E: info@siteinvestigations.ie
www.siteinvestigations.ie

Client :	Galway County Council		
Engineer :	SDS Design Engineers		
Project :	Gort Mhaicillir, Athenny		
Date :	18/12/2024	Scale :	Not to Scale
Description :	Site Investigation	Rev :	1
Drawing No :	6379/01/01	Drawn By :	SL

Legend:	
	Cable Percussion Borehole
	Trial Pit
	Soakaway Tests
	Plate Tests
	Silt Trench



APPENDIX C – MICRODRAINAGE OUTPUTS

SDS

Structual & Civil Engineers
Unit 9, N5 Business Park, Ca...
Co. Mayo, Mayo, Ireland

Date 25/03/2025 12:15
File ATTENUATION TANK -25.03...

Innovyze

Attenuation Tank Check

Designed by AT
Checked by CD

Source Control 2020.1

Page 1



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

Half Drain Time : 1624 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	42.568	0.268	0.0	3.4	3.4	140.3	O K
30 min Summer	42.687	0.387	0.0	3.5	3.5	202.3	O K
60 min Summer	42.823	0.523	0.0	3.5	3.5	273.5	O K
120 min Summer	42.966	0.666	0.0	3.5	3.5	348.0	O K
180 min Summer	43.060	0.760	0.0	3.5	3.5	396.9	O K
240 min Summer	43.103	0.803	0.0	3.5	3.5	419.4	O K
360 min Summer	43.209	0.909	0.0	3.5	3.5	475.0	O K
480 min Summer	43.264	0.964	0.0	3.5	3.5	503.8	O K
600 min Summer	43.303	1.003	0.0	3.5	3.5	524.1	O K
720 min Summer	43.331	1.031	0.0	3.5	3.5	538.7	O K
960 min Summer	43.366	1.066	0.0	3.5	3.5	557.0	O K
1440 min Summer	43.389	1.089	0.0	3.5	3.5	569.0	O K
2160 min Summer	43.393	1.093	0.0	3.5	3.5	571.0	O K
2880 min Summer	43.382	1.082	0.0	3.5	3.5	565.5	O K
4320 min Summer	43.345	1.045	0.0	3.5	3.5	546.1	O K
5760 min Summer	43.298	0.998	0.0	3.5	3.5	521.6	O K
7200 min Summer	43.248	0.948	0.0	3.5	3.5	495.4	O K
8640 min Summer	43.195	0.895	0.0	3.5	3.5	467.6	O K
10080 min Summer	43.139	0.839	0.0	3.5	3.5	438.3	O K
15 min Winter	42.622	0.322	0.0	3.5	3.5	168.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	89.434	0.0	134.5	26
30 min Summer	62.213	0.0	195.8	44
60 min Summer	40.710	0.0	279.3	74
120 min Summer	25.823	0.0	360.9	132
180 min Summer	19.616	0.0	415.8	192
240 min Summer	16.106	0.0	444.1	248
360 min Summer	12.163	0.0	507.3	370
480 min Summer	9.952	0.0	529.9	488
600 min Summer	8.513	0.0	530.8	608
720 min Summer	7.490	0.0	527.0	726
960 min Summer	6.118	0.0	516.6	964
1440 min Summer	4.599	0.0	497.4	1352
2160 min Summer	3.455	0.0	895.2	1716
2880 min Summer	2.818	0.0	964.4	2104
4320 min Summer	2.111	0.0	934.6	2944
5760 min Summer	1.719	0.0	1197.1	3760
7200 min Summer	1.465	0.0	1274.9	4616
8640 min Summer	1.285	0.0	1341.7	5456
10080 min Summer	1.151	0.0	1399.7	6264
15 min Winter	89.434	0.0	162.4	30

©1982-2020 Innovyze

SDS

Page 2

Structual & Civil Engineers Unit 9, N5 Business Park, Ca... Co. Mayo, Mayo, Ireland	Attenuation Tank Check	
Date 25/03/2025 12:15 File ATTENUATION TANK -25.03...	Designed by AT Checked by CD	
Innovyze	Source Control 2020.1	

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
30 min Winter	42.749	0.449	0.0	3.5	3.5	234.7	O K
60 min Winter	42.868	0.568	0.0	3.5	3.5	296.7	O K
120 min Winter	43.037	0.737	0.0	3.5	3.5	385.1	O K
180 min Winter	43.161	0.861	0.0	3.5	3.5	449.8	O K
240 min Winter	43.232	0.932	0.0	3.5	3.5	487.0	O K
360 min Winter	43.328	1.028	0.0	3.5	3.5	537.2	O K
480 min Winter	43.393	1.093	0.0	3.5	3.5	571.2	O K
600 min Winter	43.440	1.140	0.0	3.5	3.5	595.8	O K
720 min Winter	43.475	1.175	0.0	3.5	3.5	614.1	O K
960 min Winter	43.522	1.222	0.0	3.5	3.5	638.5	O K
1440 min Winter	43.562	1.262	0.0	3.5	3.5	659.3	O K
2160 min Winter	43.560	1.260	0.0	3.5	3.5	658.4	O K
2880 min Winter	43.546	1.246	0.0	3.5	3.5	651.1	O K
4320 min Winter	43.486	1.186	0.0	3.5	3.5	619.6	O K
5760 min Winter	43.409	1.109	0.0	3.5	3.5	579.3	O K
7200 min Winter	43.326	1.026	0.0	3.5	3.5	535.9	O K
8640 min Winter	43.239	0.939	0.0	3.5	3.5	490.6	O K
10080 min Winter	43.147	0.847	0.0	3.5	3.5	442.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	62.213	0.0	224.8	43
60 min Winter	40.710	0.0	302.1	72
120 min Winter	25.823	0.0	395.6	128
180 min Winter	19.616	0.0	464.7	188
240 min Winter	16.106	0.0	503.9	248
360 min Winter	12.163	0.0	537.3	364
480 min Winter	9.952	0.0	537.7	480
600 min Winter	8.513	0.0	533.7	596
720 min Winter	7.490	0.0	529.2	710
960 min Winter	6.118	0.0	521.7	938
1440 min Winter	4.599	0.0	514.9	1378
2160 min Winter	3.455	0.0	997.4	1800
2880 min Winter	2.818	0.0	1041.0	2224
4320 min Winter	2.111	0.0	973.2	3164
5760 min Winter	1.719	0.0	1340.8	4096
7200 min Winter	1.465	0.0	1427.7	4984
8640 min Winter	1.285	0.0	1502.2	5888
10080 min Winter	1.151	0.0	1566.9	6768

©1982-2020 Innovyze

SDS		Page 4
Structual & Civil Engineers Unit 9, N5 Business Park, Ca... Co. Mayo, Mayo, Ireland	Attenuation Tank Check	
Date 25/03/2025 12:15 File ATTENUATION TANK -25.03...	Designed by AT Checked by CD	
Innovyze Source Control 2020.1		

Model Details

Storage is Online Cover Level (m) 44.380

Cellular Storage Structure

Invert Level (m) 42.300 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	550.0	0.0	1.321	0.6	0.0
1.320	550.0	0.0	2.080	0.6	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0085-3600-1320-3600
Design Head (m) 1.320
Design Flow (l/s) 3.6
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 85
Invert Level (m) 42.300
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.320	3.6
Flush-Flo™	0.375	3.5
Kick-Flo®	0.760	2.8
Mean Flow over Head Range	-	3.1

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	2.6	1.200	3.4	3.000	5.3	7.000	7.9
0.200	3.3	1.400	3.7	3.500	5.7	7.500	8.1
0.300	3.4	1.600	3.9	4.000	6.0	8.000	8.4
0.400	3.5	1.800	4.2	4.500	6.4	8.500	8.6
0.500	3.4	2.000	4.4	5.000	6.7	9.000	8.9
0.600	3.3	2.200	4.6	5.500	7.0	9.500	9.1
0.800	2.9	2.400	4.7	6.000	7.3		
1.000	3.2	2.600	4.9	6.500	7.6		

©1982-2020 Innovyze

APPENDIX D – MET ÉIREANN RAINFALL RETURN PERIOD DATA

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 149624, Northing: 228001,

DURATION	Interval		Years														
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,	
5 mins	2.7,	3.7,	4.2,	5.0,	5.6,	6.0,	7.4,	9.0,	10.0,	11.4,	12.7,	13.6,	15.1,	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,	19.0,	21.1,	22.7,	24.1,	N/A ,	
15 mins	4.3,	6.0,	6.9,	8.3,	9.2,	9.9,	12.1,	14.7,	16.4,	18.7,	20.8,	22.4,	24.8,	26.7,	28.3,	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,	29.7,	31.9,	33.6,	N/A ,	
1 hours	7.7,	10.3,	11.7,	13.6,	14.9,	15.9,	19.0,	22.5,	24.7,	27.8,	30.5,	32.5,	35.6,	38.0,	39.9,	N/A ,	
2 hours	10.3,	13.5,	15.1,	17.5,	19.0,	20.2,	23.8,	27.8,	30.4,	33.9,	36.9,	39.2,	42.6,	45.3,	47.4,	N/A ,	
3 hours	12.3,	15.8,	17.6,	20.2,	21.9,	23.2,	27.2,	31.5,	34.3,	38.0,	41.2,	43.7,	47.4,	50.2,	52.4,	N/A ,	
4 hours	13.8,	17.7,	19.6,	22.4,	24.2,	25.6,	29.9,	34.4,	37.3,	41.3,	44.7,	47.2,	51.0,	53.9,	56.3,	N/A ,	
6 hours	16.4,	20.7,	22.8,	25.9,	27.9,	29.4,	34.0,	39.0,	42.1,	46.3,	49.9,	52.7,	56.7,	59.8,	62.3,	N/A ,	
9 hours	19.4,	24.2,	26.6,	30.0,	32.1,	33.8,	38.8,	44.2,	47.5,	52.0,	55.9,	58.7,	63.0,	66.2,	68.9,	N/A ,	
12 hours	21.8,	27.1,	29.6,	33.2,	35.5,	37.3,	42.6,	48.3,	51.8,	56.5,	60.5,	63.5,	67.9,	71.3,	74.0,	N/A ,	
18 hours	25.9,	31.7,	34.5,	38.4,	40.9,	42.8,	48.6,	54.7,	58.4,	63.4,	67.6,	70.8,	75.5,	79.0,	81.8,	N/A ,	
24 hours	29.2,	35.4,	38.4,	42.6,	45.3,	47.3,	53.4,	59.7,	63.6,	68.8,	73.2,	76.5,	81.3,	84.9,	87.8,	97.5,	
2 days	37.9,	45.2,	48.7,	53.5,	56.6,	58.9,	65.8,	72.9,	77.2,	82.9,	87.7,	91.3,	96.6,	100.5,	103.6,	113.9,	
3 days	45.4,	53.6,	57.5,	62.9,	66.2,	68.7,	76.3,	84.1,	88.8,	95.0,	100.2,	104.0,	109.7,	113.8,	117.2,	128.2,	
4 days	52.2,	61.2,	65.4,	71.3,	74.9,	77.7,	85.8,	94.2,	99.2,	105.8,	111.4,	115.5,	121.4,	125.9,	129.4,	141.0,	
6 days	64.6,	75.0,	79.9,	86.6,	90.7,	93.8,	103.0,	112.4,	118.0,	125.4,	131.5,	136.0,	142.6,	147.5,	151.4,	164.1,	
8 days	76.1,	87.7,	93.1,	100.5,	105.1,	108.5,	118.7,	128.9,	135.1,	143.1,	149.8,	154.7,	161.8,	167.1,	171.3,	184.9,	
10 days	86.9,	99.7,	105.6,	113.7,	118.7,	122.4,	133.4,	144.4,	151.0,	159.7,	166.8,	172.0,	179.7,	185.3,	189.7,	204.3,	
12 days	97.4,	111.2,	117.6,	126.2,	131.6,	135.6,	147.3,	159.1,	166.2,	175.3,	182.9,	188.5,	196.6,	202.5,	207.2,	222.6,	
16 days	117.5,	133.1,	140.4,	150.2,	156.2,	160.6,	173.8,	186.9,	194.8,	205.0,	213.4,	219.5,	228.4,	234.9,	240.1,	256.9,	
20 days	136.8,	154.2,	162.2,	173.0,	179.6,	184.5,	199.0,	213.3,	221.8,	232.9,	242.0,	248.7,	258.3,	265.4,	271.0,	289.1,	
25 days	160.2,	179.6,	188.5,	200.5,	207.8,	213.2,	229.1,	244.8,	254.2,	266.3,	276.2,	283.5,	293.9,	301.6,	307.7,	327.2,	

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

$$M5_{60} = 15.9$$

$$M5_{2day} = 58.9$$

$$r = M5_{60}/M5_{2day}$$

$$r = 15.9/58.90 = 0.2699$$

$$r = 0.270$$

APPENDIX E – UISCE EIREANN PRE-CONNECTION ENQUIRY

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):

[illegible][illegible][illegible]

Company registration number (if applicable):

Parent company registered company name (if applicable):

[illegible][illegible][illegible]

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

[illegible][illegible][illegible][illegible][illegible]

*Eircode:

--	--	--	--	--	--	--

Please provide either a landline or a mobile number

[illegible][illegible][illegible]

2 Agent details (if applicable):

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

*Contact name:

Company name (if applicable):

*Postal address:

*Eircode:

Please provide either a landline or a mobile number

Landline:

*Mobile

*Email:

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):

*Address 2

*Address 3

*City/Town

*County Eircode

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

Eastings (X) Northings (Y)

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:

7 *Has full planning permission been granted? Yes ☐ No ☐

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

Yes ☐ No ☐

[illegible]

Section C | Development details

Domestic:

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

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
-----------------------------	--------------

[illegible]

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:**

		/			/				
--	--	---	--	--	---	--	--	--	--

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: / /

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

m

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

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		I/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):

[illegible]

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:**

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

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.

[illegible]

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?

--	--	--	--	--	--

--	--	--	--	--

m

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

--	--	--	--	--

 m

--	--	--	--	--

m

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

A diagram of a 1D lattice with 5 sites, represented by a horizontal row of 5 squares. To the right of the squares is a vertical line segment labeled 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: | ☐ |
| | <ul style="list-style-type: none"> 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:

Your full name (in BLOCK CAPITALS):

[illegible]

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.

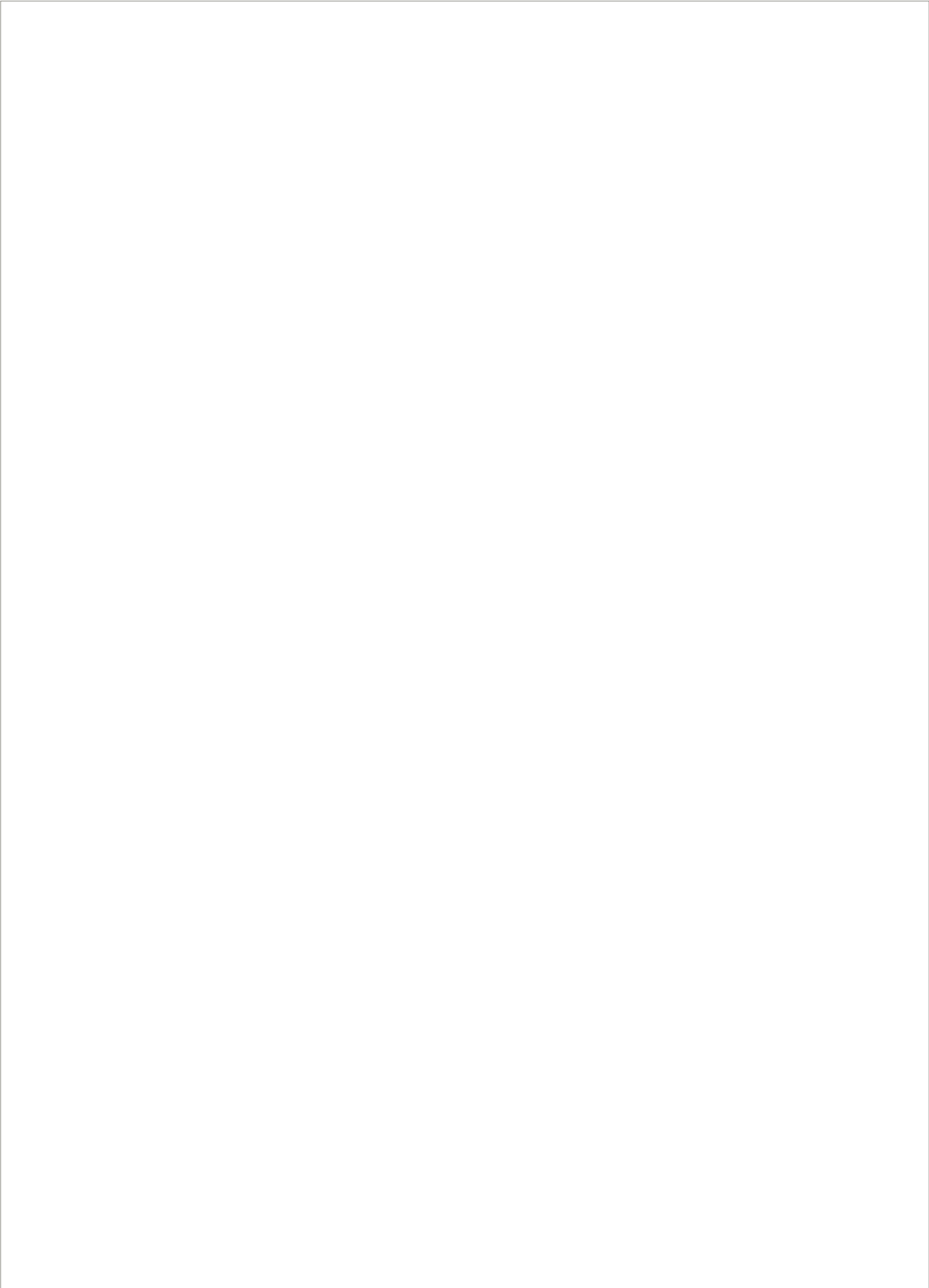
Irish Water is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions 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.

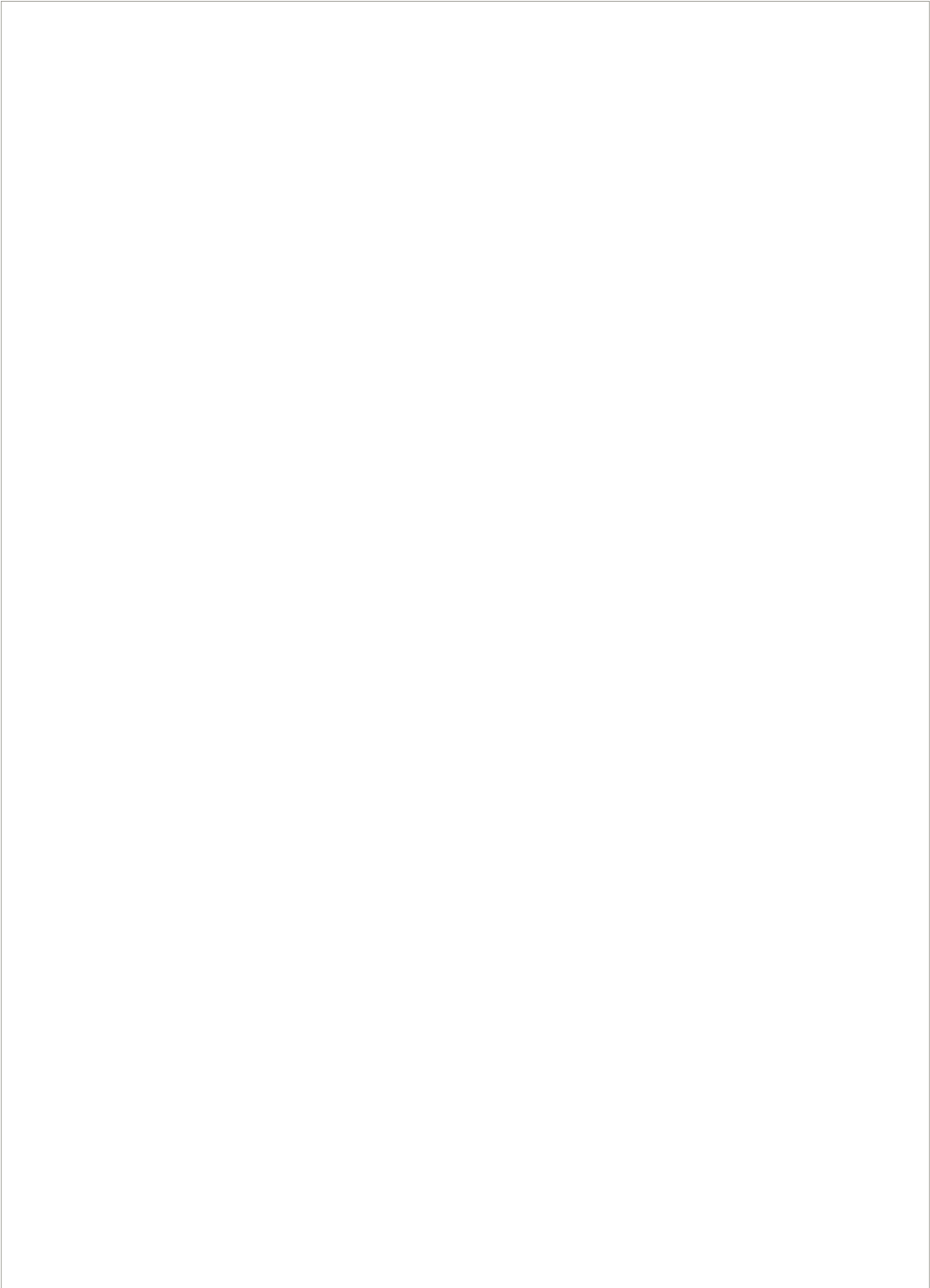
Calculations

Water demand

On-site storage

Fire flow requirements





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.

