Ballyoulster SHD – Phase 1 Residential Development

Infrastructure Design Report

180221-DBFL-XX-XX-RP-C-0001

INFRASTRUCTURE

May 2022

DBFL CONSULTING ENGINEERS

Title:	**Ballyoulster SHD – Phase 1 Residential Development**		
Document Title:	**Infrastructure Design Report**		
File Ref:	**180221-DBFL-XX-XX-RP-C-0001**		
Status:	**S3 Stage Approval**	Rev:	**P03**

Rev.	Date	Description	Prepared	Reviewed	Approved
P01	Oct 2021	Stage 2 Planning	PLY	NOH	DJR
P02	May 2022	Stage 3 revision	PLY	NOH	KJS
P03	June 2022	S4 – Stage Approval	PLY	NOH	KJS

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1 Introduction

1.1 Background

DBFL Consulting Engineers were appointed on behalf of Kieran Curtin, Receiver over certain assets of Maplewood Developments Unlimited Company (in liquidation and in receivership) to provide engineering services to accompany a planning application for a proposed strategic housing development, in Ballyoulster, Celbridge, Co. Kildare.

The proposed development ("the site") measures approximately 13.4ha in extent and comprises of; 344 no. residential units (54 no. 1 beds, 30 no. 2 beds, 210 no. 3 beds and 50 no. 4 beds), a childcare facility with a GFA of c. 384 sq.m, public and communal open space, landscaping, car and cycle parking spaces, provision of an access road from Dublin Road and Shinkeen Road, associated vehicular accesses, internal roads, pedestrian and cycle paths, bin storage, ESB Stations, pumping station, 3no bridge crossings and all associated site and infrastructural works.

The site is located within lands zoned under "Key Development Area 2 – Ballyouster" (KDA 2) in the Celbridge Local area Plan (2017-2023).

1.2 Objectives

This report provides information regarding the existing site, and addresses the infrastructural demands of the proposed development including the following:

- Site Access and Road Layout
- Surface Water Drainage
- Flood Risk
- Foul Drainage
- Water Supply

1.3 Location

The site is located within lands at Dublin Road and the Shinkeen Road, within the townlands of Donaghcumper and Ballyoulster, Celbridge, Co. Kildare. The application site is bound by a greenfield site, Donaghcumper Cemetery, Retronix Semiconductor company and the Dublin Road to the north, the Rye River Brewing Company and the Ballyoulster Park housing estate to the northeast, the primrose Gate housing estate to the south, agricultural lands to the east and Shinkeen Road to the west. Donaghcumper Medieval Church Ruins (RPS No. B11-02) and the house on Dublin Road, Donaghcumper (RPS No. B11-26), are protected structures located north of the application site.

The site is divided into three number sub-site areas referred to as; Site A, Site B and Site C (Figure 1-2). Located to the east of Site A along the Shinkeen Stream there is a large public open space that will house play areas, public amenities, and which also forms part of a flood plain. No building works are proposed within this flood plain and reference should be made to the Site-Specific Flood Risk Assessment (SSFRA) report developed by McCloy Consulting Engineers as part of this application.

Located to the south of Site B partially bordering the Shinkeen Stream there is a large public open space that will primarily be a wild meadow. This area is of archaeological interest and as a result is being preserved careful consideration has been made with regards to development in this area. As such only critical infrastructure along the peripherals of the subject area is being installed. Reference should be made to the EIAR Chapter 4 Archaeology, Architectural and Cultural Heritage archaeological report prepared as part of this application.

The Urban Design Strategy chapter, and associated appendix, of the Architectural Design Statement prepared by OMP provides an overview of the development strategy for the subject site and the wider KDA 2 lands. The urban design strategy illustrates how the proposed Phase 1 development adheres to all the key objectives for the lands as set out in the Celbridge Local Area Plan 2017-2023 and how it relates to the potential future development of the overall KDA 2 lands. As part of this it provides a coherent strategy for future planning applications expected to come forward on a phased basis, and includes proposals in relation to the public realm, built form, green infrastructure, movement hierarchy with supporting civils infrastructure. In summary it is envisaged that the wider KDA 2 lands could be delivered over 3 no. residential phases with associated physical and social infrastructure. The delivery of the lands reserved for the schools will be delivered separately by the Department of Education and is incorporated into the phased

approach for the overall lands. The strategy has been developed following consultation with the Planning Authority since 2020 (period 2020-2021) in respect to the overall landholding, and has been informed by the pre-application consultations with the Planning Authority and An Bord Pleanala, and ongoing engagement with the Department of Education.

Phase 1 has regard to this overall urban design strategy and has evolved to ensure the proposed development addresses potential flood risk and identified archaeological features which are to be retained in situ within the site, whilst ensuring it continues to meet the overall key objectives for the KDA 2 lands set out in the Celbridge LAP 2017-2023.

As a result of these site constraints in March 2022 Client proposed to Kildare County Council a revised Area plan for KDA which provided an alternative housing arrangement but still was within the framework of the overall KDA 2 lands in respect of Celbridge LAP. Reference should be made to the architect's design statement and reports for further details of this.

Figure 1-1: *Site Boundary indicative Only*

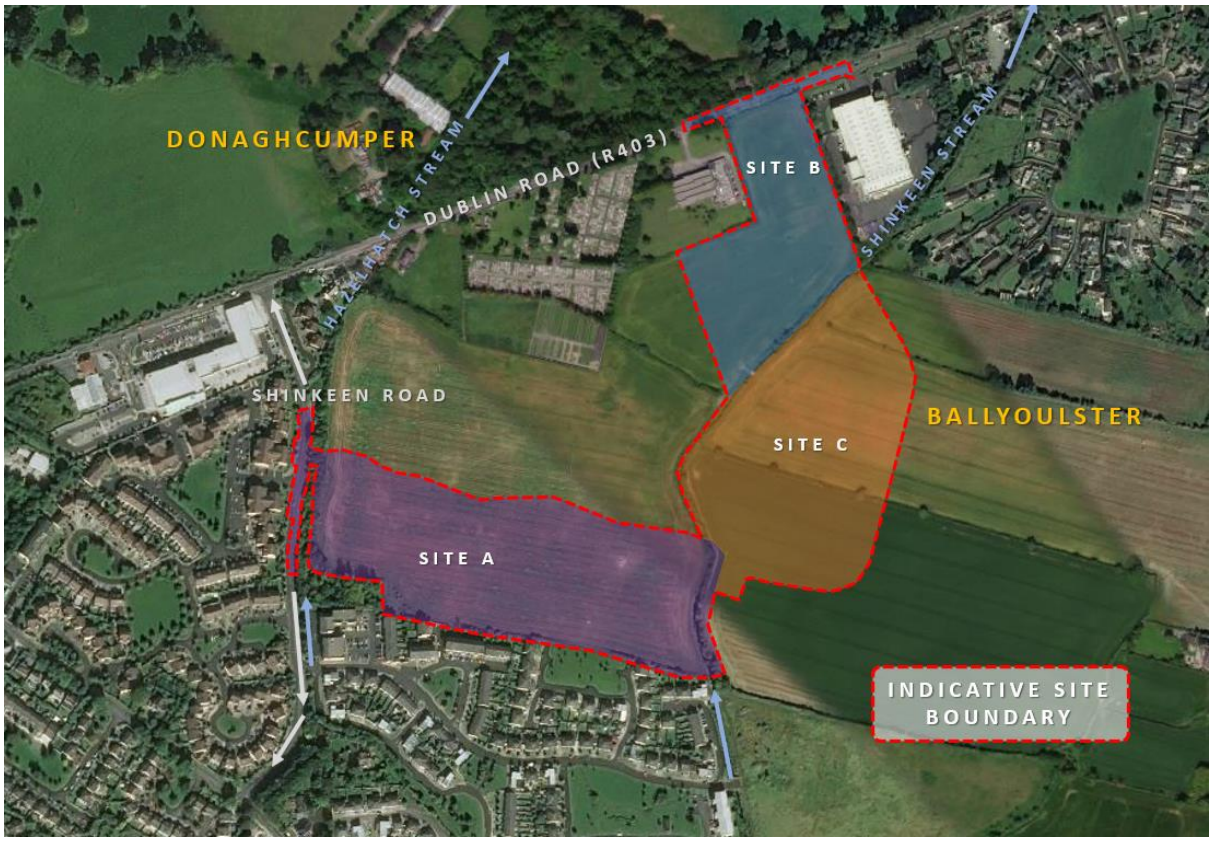


Figure 1-2: Site Boundary with Sub-Sites indicated (Indicative only)

1.4 Topography

The subject lands are predominately flat in character with a gentle slope from the central spine of the site to the watercourses on the eastern and western sides. The sites are bisected by the Shinkeen Stream to the west of the development and there is a further stream known as the Hazelhatch Watercourse to the east. The character of the Shinkeen Watercourse is a very deep watercourse of circa 3-4m deep banks. The depth of this stream is a fundamental aspect to the flood zoning in this area and thus these levels will not be disturbed as part of the new development.

From the central spines of each sub-site the lands falls from towards its West and Eastern boundary edges at gradients ranging from 1/200 to 1/350, and the site falls from the Southern boundary to the Northern boundary at gradients ranging from 1/150 to 1/240 within sub-site B.

A detailed topographical survey of the site was undertaken in December 2020 and is shown in the background of the Proposed Roads Layout Plan (refer to DBFL Drawing No. 180221-DBFL-RD-SP-DR-C-2000 and 180221-DBFL-RD-SP-DR-C-2001 and 180221-DBFL-RD-SP-DR-C-2002). The topographical survey is also included within Appendix H of this report.

Figure 1-3: Existing Site Topography illustrating falls

1.5 Ground Conditions

IGSL Ltd undertook an extensive ground intrusive survey within the site between August – January 202, refer to Appendix B. The scope of the works were significant which included the following:

- 8nr Rotary Core Holes to form an understanding of bedrock strata and form monitor wells
- 25nr trial pits to permit close examination of the upper soils
- 24nr Dynamic Probes to obtain a resistance profile
- 8nr Plate Bearing tests to determine CBR values on subsoils
- 18nr Infiltration tests to assess suitability of the sub-soils for soakaways
- 8nr Standpipes and data loggers for the continuous monitoring of groundwater.

The ground site investigation and results of the subject site is included within Appendix B of this report. Reference should also be made to drawing 180221-DBFL-EW-SP-DR-C-9050 which overlays the site investigation over the proposed development and surface water features.

1.6 Proposed Development

The proposed Residential Development ('the site") is located between lands at Dublin Road and the Shinkeen Road, within the townlands of Donaghcumper and Ballyoulster, Celbridge, Co.

Kildare. The site is located within lands zoned under "Key Development Area 2 – Ballyouster" (KDA 2) in the Celbridge Local area Plan (2017-2023).

The proposed development comprises a Strategic Housing Development of 344 no. residential units (comprising 54 no. 1 beds, 30 no. 2 beds, 210 no. 3 beds and 50 no. 4 beds), a childcare facility with a GFA of c. 384 sq.m, public and communal open space, landscaping, car and cycle parking spaces, provision of an access road from Dublin Road and Shinkeen Road, associated vehicular accesses, internal roads, pedestrian and cycle paths, bin storage, pumping station and all associated site and infrastructural works.

1.7 Phasing

Reference should be made to the architectural 20007-OMP-ZZ-PH-DR-A-1009 which provides details of the proposed phasing of development on the subject site. In summary, the proposed construction of the development has been split into three number distinct phases over a 5-year construction programme as per Figure 1.5 and Table 1 below.

The phases will allow the provision or upgrading of any external infrastructure and services to be provided on a phased basis and provide an appropriate quantum of development and supporting infrastructure within each part of the overall scheme. This will also include any site enabling works. A seven-year permission is sought for the development which has regard to the scale of development, likely timeframe for tendering and construction of each phase.

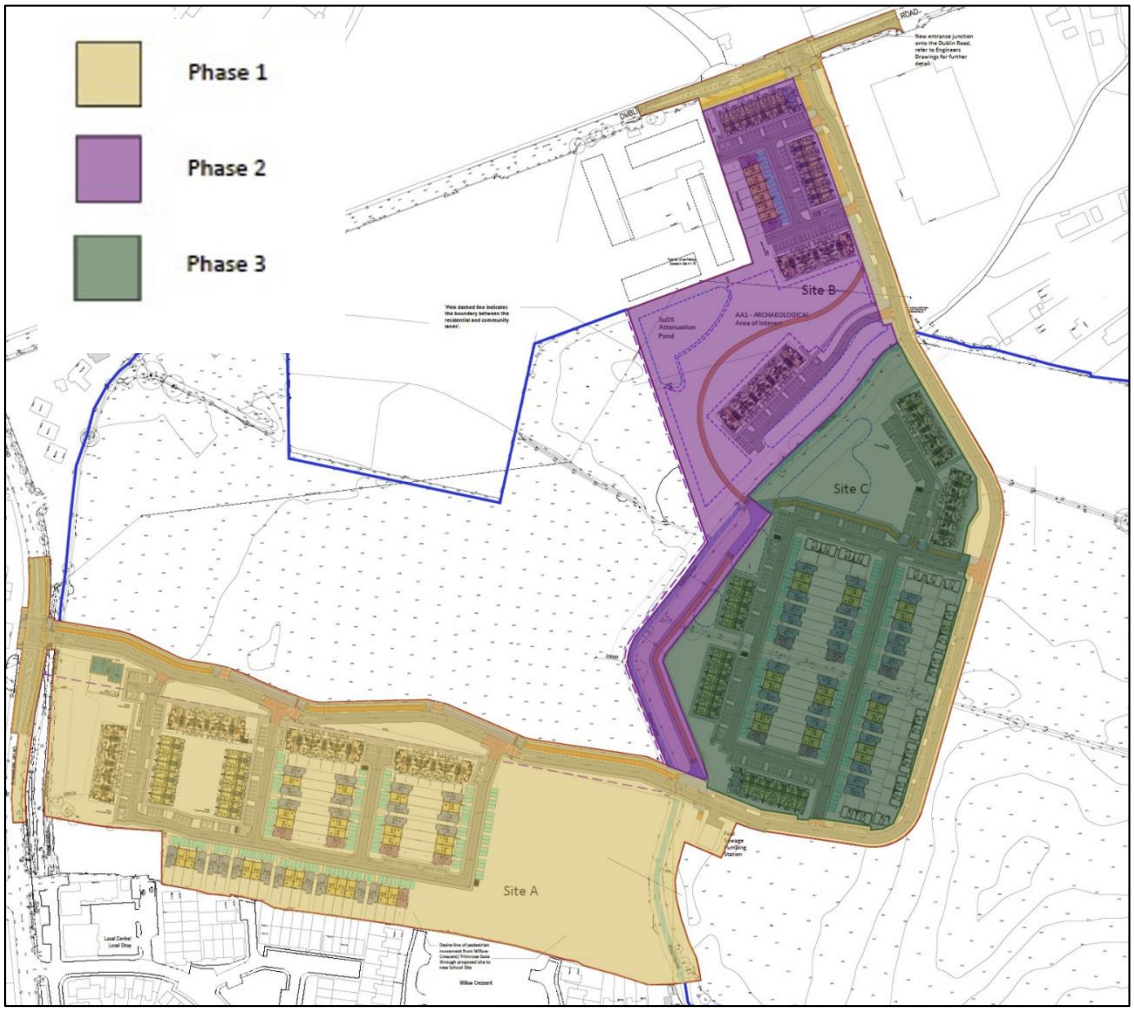


Figure 1-4 : Proposed Phasing

It is proposed that Site A (112 residential units and the childcare facility) along with the local distributor road linking the Shinkeen and Dublin roads would be developed first. This would include the 3 number bridge crossings over the Shinkeen and Hazelhatch watercourses, which would prevent any temporary structures being constructed, the foul pumping station and associated infrastructure and the junction upgrades. During this period, it is anticipated that any field works in the area of archaeological interest would be undertaken. It is proposed this would be over a 24-month programme. This is aligned with the Irish Water upgrade works, including the Primrose Hill gravity sewer project which is due to be delivered by 2025. This would align with the delivery of the first phase of units on the subject lands, assuming grant of permission by Q4 2022 / Q1 2023, with the 6 month pre-construction phase to commence in 2023, followed by an 18 month construction time frame over 2023 to the end of 2024. First occupation in 2025 aligns with the completion of the Irish Water upgrade works.

The early delivery of infrastructure within the Phase 1 works, including the full extent of the local distributor road, also facilitates the key infrastructure to support the delivery of the lands reserved for the schools.

Phase 2 would consist of all housing units and associated infrastructure within Site B (71 residential units) and would include the pedestrian and cycle links along the riparian strip which join Sites A and B respectively. It is anticipated this would be over a 12-month programme.

The final phase (Phase 3) will consist of all housing and infrastructure works associated with Site C (142 residential units) and would be anticipated to be completed over a 24-month programme.

Table 1 Proposed Phasing and Key Supporting Infrastructure / Development

	Key Supporting Infrastructure / Development
Phase 1 (24 month programme)	• Site A comprising 52 no. houses and 60 no. apartment / duplex units and associated communal open space • Childcare Facility • Provision of 1 no. Local Park and Playground • Road upgrades, alterations and improvements to the Dublin Road and the Shinkeen Road, including construction of 2 no. signalised junctions and delivery of the local distributer road and associated pedestrian and cycle links • Proposed infrastructure provided up to the application site boundary to facilitate potential future connections to adjoining lands • Provision of associated site services (off site connections to be delivered by Irish Water prior to occupation – see Infrastructure Design Report prepared by DBFL Consulting Engineers)
Phase 2 (12 month programme)	• Site B comprising 8 no. houses and 63 no. apartment / duplex units and associated communal open space • Provision of 1 no. Local Park • Proposed infrastructure provided up to the application site boundary to facilitate potential future connections to adjoining lands • Provision of associated site services
Phase 3 (24 month programme)	• Site C comprising 71 no. houses and 71 no. apartment / duplex units and associated communal open space • Provision of 1 no. Local Park and Playground • Provision of associated site services

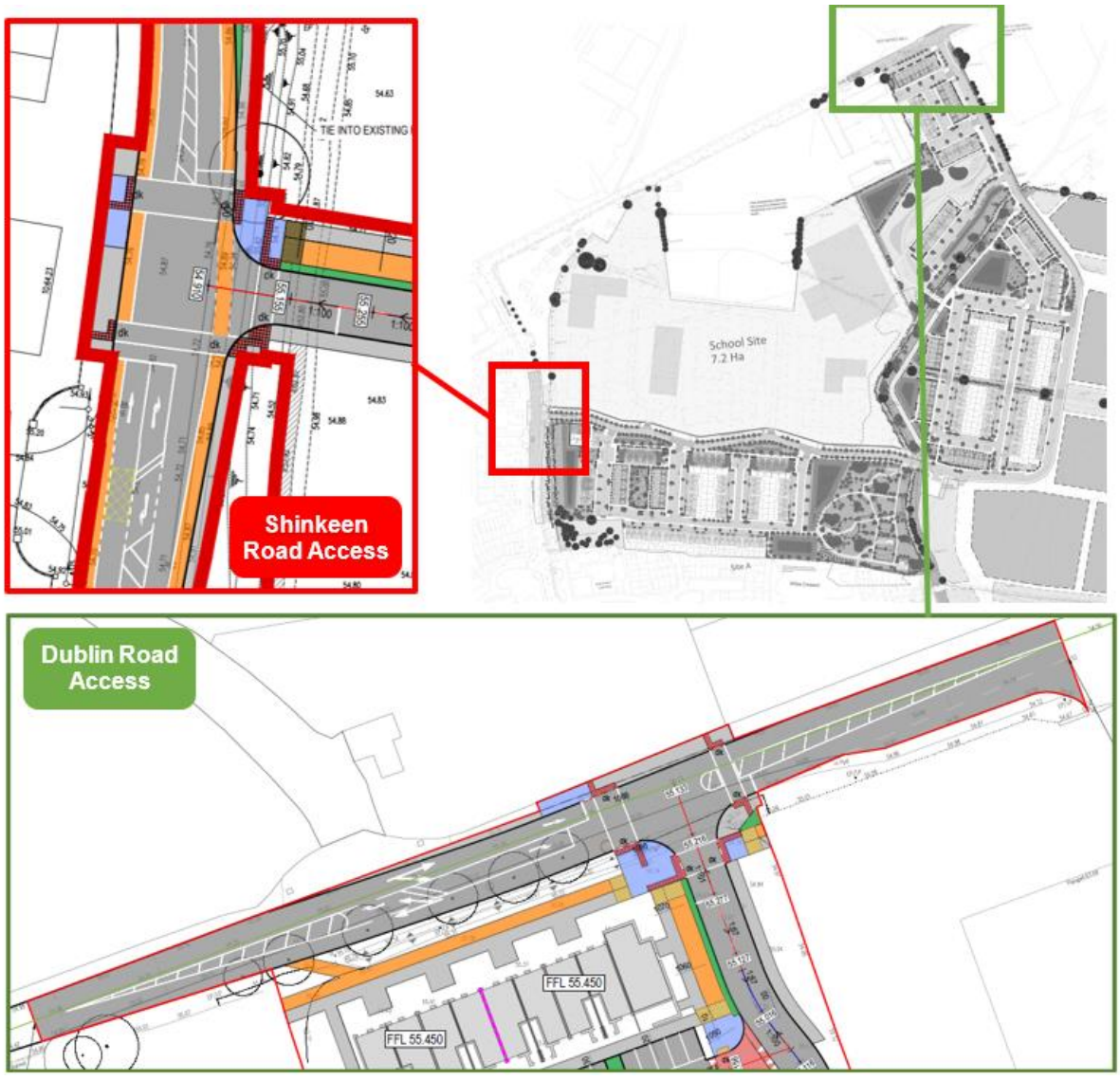
The proposed phasing of development accords with the phases of development for the KDA 2 lands set out in Section 13.5.1 of the Celbridge LAP, which can be summarised as follows:

- The overall Ballyoulster SHD (Phase 1) application, with 344 no. units, does not exceed the number of units on the KDA 2 lands (351) to be completed prior to the completion of improved pedestrian and cycle facilities on the existing Liffey Bridge;
- A childcare facility is proposed as part of the Phase 1 proposals, and can be completed prior to the commencement of dwelling no. 101 if considered necessary by the Board;
- The proposed Local Parks will be completed prior to the occupation of 351 no. units;
- A TTA is included with the application to is submitted to demonstrate there is there is sufficient capacity of the existing network to accommodate the proposed development.

2 Site Access and Street Layout

2.1 Site Access Layout

It is proposed to construct two number new traffic junctions off the R403 Dublin Road and the Shinkeen Road to service the site. Both junctions will take the form of signal-controlled junctions as presented in Figure 2.1 below. These accesses will also accommodate future vehicular access to the school's site and future residential development on the wider KDA 2 lands. Refer to DBFL Drawings No. 180221-DBFL-Z0-SP-DR-C-2001 and 180221-DBFL-Z0-SP-DR-C-2002 for the proposed site access layout at these regional and local roads. For further information refer to the Traffic and Transport Assessment report 180221-DBFL-TR-XX-RP-0003 on the existing and proposed transport environment.



FigureFigure 2-1: Proposed Site Access into proposed development

2.2 Street Layout Design

The subject proposals include for the provision of a new 6.5m wide "Local Distributor Road" between the site access junctions located on Shinkeen Road and Dublin Road. In addition, provision has been made for 2 no. access locations to the aforementioned school's site to the north as well as links to future phases of the KDA 2 lands to the east and south.

The site includes for the provision of 3 nr. Proposed bridge crossings for pedestrian and vehicular traffic, these bridges will require Section 50 consent by OPW prior to construction under the Arterial Drainage Act 1945, Section 50 consent cannot be provided prior to planning permission as such this application will be made post receipt of planning permission.

Dedicated pedestrian footways are proposed along both sides of the corridor with a 2-way cycle track proposed on the northern / western side. The proposed alignment has been designed to comply with the road / pedestrian / cycle objective indicatively illustrated in the Celbridge LAP (Figure 2.2). It is also proposed to provide signage and line marking in accordance with the Department of Transport's Traffic Signs Manual.

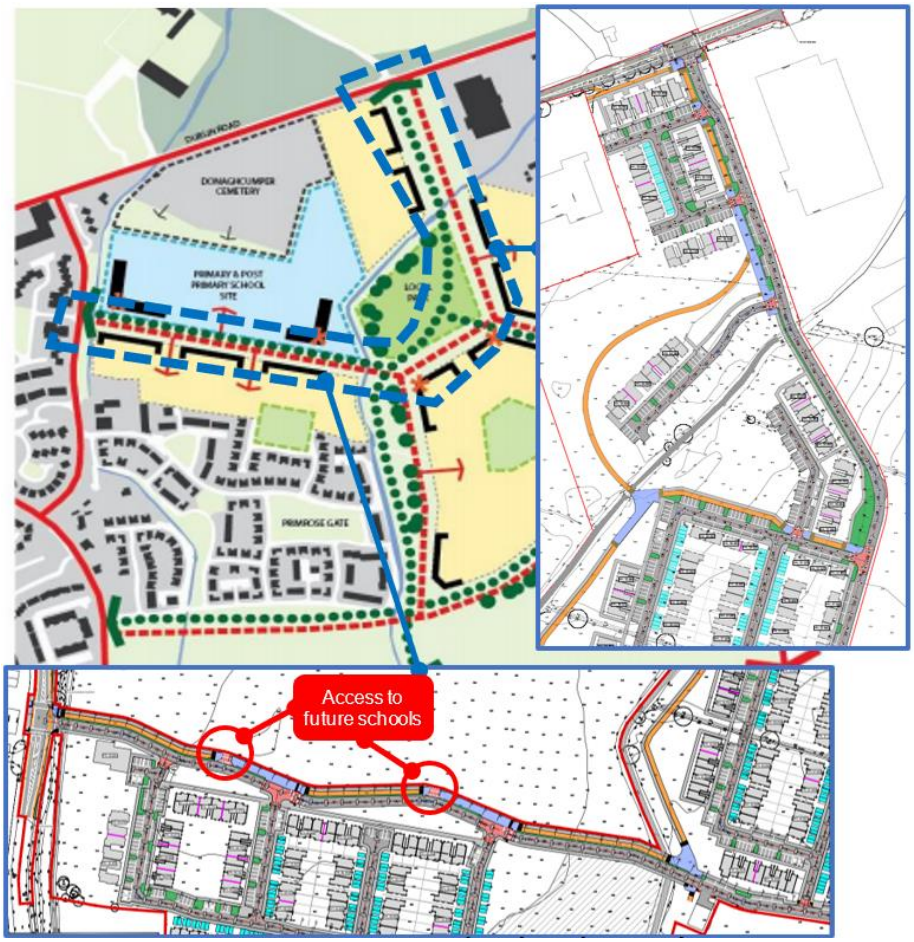


Figure 2.2: Proposed Local Distributor Road and Access to future Schools

The site's street layout is shown on DBFL Drawings no's 180221-DBFL-Z0-SP-DR-C-2001 and 180221-DBFL-Z0-SP-DR-C-2002. Other DMURS Street Design guidelines incorporated in the site's street layout including the following:

- Primary/ Local Access Streets – 5.5m
- Secondary Local Access Streets 5.5m wide
- Homezone Streets 5.0-5.5m wide
- Footpaths – 2.0m wide
- Corner Radii at junctions within the site – 3.0m to 4.5m
- Typical Longitudinal Gradient –vary from 1/40 to 1/130
- Cross Fall – 1/40
- Horizontal traffic calming at regular intervals
- Speed reduction bends incorporated
- On street parking where applicable
- Kerb buildouts introduced for traffic calming
- Long straights sections of roads less than 70m. Due to the site constraints aforementioned some roads have straights greater than 70m however where this does occur, we have introduced traffic calming measures such as buildouts *tree* planting alongside the road and on-street parking which reduces the perceived width along these sections which helps reduce speeds.
- All parking spaces 2.5m x 5.0m as per Chapter 17 of the Kildare Development Plan

A design speed limit of 30 km/hour has been applied throughout the development in accordance with the Design Manual for Urban Roads and Streets (function – local road, context – neighbourhood, pedestrian priority).

Further description of same is included in the DMURS Compliance Statement included within the application. For further information refer to the Traffic and Transport Assessment report 180221-DBFL-TR-XX-RP-0003 on the existing and proposed transport environment.

2.3 Vehicle Tracking

The proposed street layout has been tracked to demonstrate that the site's proposed corner radii and turning heads will accommodate large vehicles such as refuse trucks and fire engines (refer

to DBFL Drawings No. 180221-DBFL-Z0-SP-DR-C-2001 Proposed Roads Layout and Elevations - Sheet 1 and 180221-DBFL-Z0-SP-DR-C-2002 Proposed Roads Layout and Elevations - Sheet 2.

On short cul-de-sac's provision has been made for delivery van turning only or refuse truck can essentially turn at their entrance. In general, the number of cul-de sacs within the scheme have been minimised.

2.4 Access Driveways

Proposed finished floor levels and proposed road levels are set to accommodate targeted gradients of 1:40 to 1:80 for access driveways.

The design allows for dropped kerbs and an increased concrete pavement thickness of 150mm where access driveways cross footpaths.

Access driveways and in-curtilage parking bays (outside road and footpath areas to be taken in charge by Kildare County Council) are designed as permeable type pavements. Public Parking bays to be adopted by Kildare County Council shall be impermeable.

2.5 Traffic, Transportation & Parking

A separate Traffic and Transportation assessment has been prepared as part of this planning application. Refer to DBFL report 180221-DBFL-XX-XX-RP-C-0003 TTA which includes a full breakdown of the vehicle and cycle parking quantum and ratios for the development.

2.6 Pavement Design Standards

Local streets within the site are designed in accordance with the Department of the Environment Recommendations for Site Development Works, the Design Manual for Urban Roads and Streets (DMURS) and Local Authority requirements.

Proposed road construction materials and thicknesses which are based on an existing minimum subsoil CBR of 2.0% at road formation level, which has been based on the GSI undertaken in December 2021. Actual CBR values and ground conditions are to be confirmed by site specific investigations prior to road construction.

2.7 Road Safety Audit

A stage 1/2 Road Safety Audit as requested by Kildare County Council was undertaken in May 2022 and reference should be made to this report in the application. All issued within the audit were responded to and the feedback form is also a part of the audit.

3 Surface Water Drainage

3.1 Reference drawings

The following DBFL drawings should be referred to as part of this chapter.

- 180221-DBFL-SW-SP-DR-C-1000 Surface Water Drainage Overall Layout and Strategy
- 180221-DBFL-SW-SP-DR-C-1001 Surface Water Drainage Sheet 1
- 180221-DBFL-SW-SP-DR-C-1001 Surface Water Drainage Sheet 1
- 180221-DBFL-SW-SP-DR-C-1001 Surface Water Drainage Sheet 1
- 180221-DBFL-SW-SP-DR-C-1321 Surface Water Catchments
- 180221-DBFL-SW-SP-DR-C-5001 Surface Water Typical Construction Details Sheet 1
- 180221-DBFL-SW-SP-DR-C-5002 Surface Water Typical Construction Details Sheet 2
- 180221-DBFL-SW-SP-DR-C-5003 Surface Water Typical Construction Details Sheet 3
- 180221-DBFL-SW-SP-DR-C-5004 Surface Water Typical Construction Details Sheet 4
- 180221-DBFL-SW-SP-DR-C-5005 Surface Water Typical Construction Details Sheet 5
- 180221-DBFL-SW-SP-DR-C-5011 Surface Water Details Sheet 1
- 180221-DBFL-SW-SP-DR-C-5012 Surface Water Details Sheet 2
- 180221-DBFL-SW-SP-M2-C-3001 Storm Water Network Longsection - Sheet 1
- 180221-DBFL-SW-SP-M2-C-3002 Storm Water Network Longsection - Sheet 2
- 180221-DBFL-SW-SP-M2-C-3003 Storm Water Network Longsection - Sheet 3
- 180221-DBFL-SW-SP-M2-C-3004 Storm Water Network Longsection - Sheet 4
- 180221-DBFL-SW-SP-M2-C-3005 Storm Water Network Longsection - Sheet 5
- 180221-DBFL-RS-SP-DR-C-1151 Typical Arrangement For Bridge Crossing No.1 Plan and Section
- 180221-DBFL-RS-SP-DR-C-1152 Typical Arrangement For Bridge Crossing No.2 Plan and Section
- 180221-DBFL-RS-SP-DR-C-1153 Typical Arrangement For Bridge Crossing No.3 Plan and Section
- 180221-DBFL-SW-SP-DR-C-1310 Overland Flow
- 180221-DBFL-EW-SP-DR-C-9050 – Site Investigation

3.2 Existing Surface Water Drainage

As noted in Section 1.4, the site is predominately flat with minimal falls towards its Eastern and Western Boundaries. The Shinkeen stream bisects the site in a South to North direction and there is a further watercourse known as the Hazelhatch Watercourse located along the eastern boundary which also flows in a south to north direction. Both watercourses form part of the Liffey Catchment and is contained within the Liffey_SC_09 Sub-catchment area. Both surface watercourses will provide the required outfalls for the site

Figure 3-1 Extract from Topographical survey. (Boundary Indicative Only)

3.3 Basis of Design

Over a number of months DBFL have liaised with Kildare County Council Water Services department regarding the surface water proposals for the site. In May 2022 DBFL design Engineer (N O'Hare) and Kildare County Council Senior Executive Engineer from the Water Services Department (D Hall) met via Microsoft teams to discuss the overall design strategy for the latest layout, in addition to addressing comments from the KCC WSD opinion report on the design dated 26/11/2021. A synopsis of the responses to the comments raised in this report is included in Appendix E of this report.

An overall surface water drainage strategy has been developed by DBFL Consulting Engineers for the development site. This strategy shown on drawing number 180221-DBFL-SW-SP-DR-C-1321 outlines each catchment and its corresponding attenuation facility. Drawings 180221-DBFL-SW-SP-DR-C-1000 to 180221-DBFL-SW-SP-DR-C-1002 identifies the location of Suds features including, tree pits, bio-retention areas and swales, permeable parking bays, rain gardens, bio swales, ponds detention basins and the like.

Surface water runoff from the development will be attenuated to greenfield runoff rates (Qbar) in accordance with the Greater Dublin Strategic Drainage Study (GDSDS). It should be noted that "Long Term" storage in accordance with Section 6.7 of the GDSDS is not required where outflows are limited to Qbar in accordance with Table 6.3 in the GDSDS. See Appendix F for permissible outflow calculation.

Surface water discharged from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent) and associated SUDS features and overland nature-based systems such as ponds, swales and detention basins. Surface water discharge will also pass via a full retention fuel / oil separator (sized in accordance with permitted discharge from the site) and shall be restricted to 2.2l/s/ha. Figure 5 below outlines the proposed treatment terrain for this proposed development.

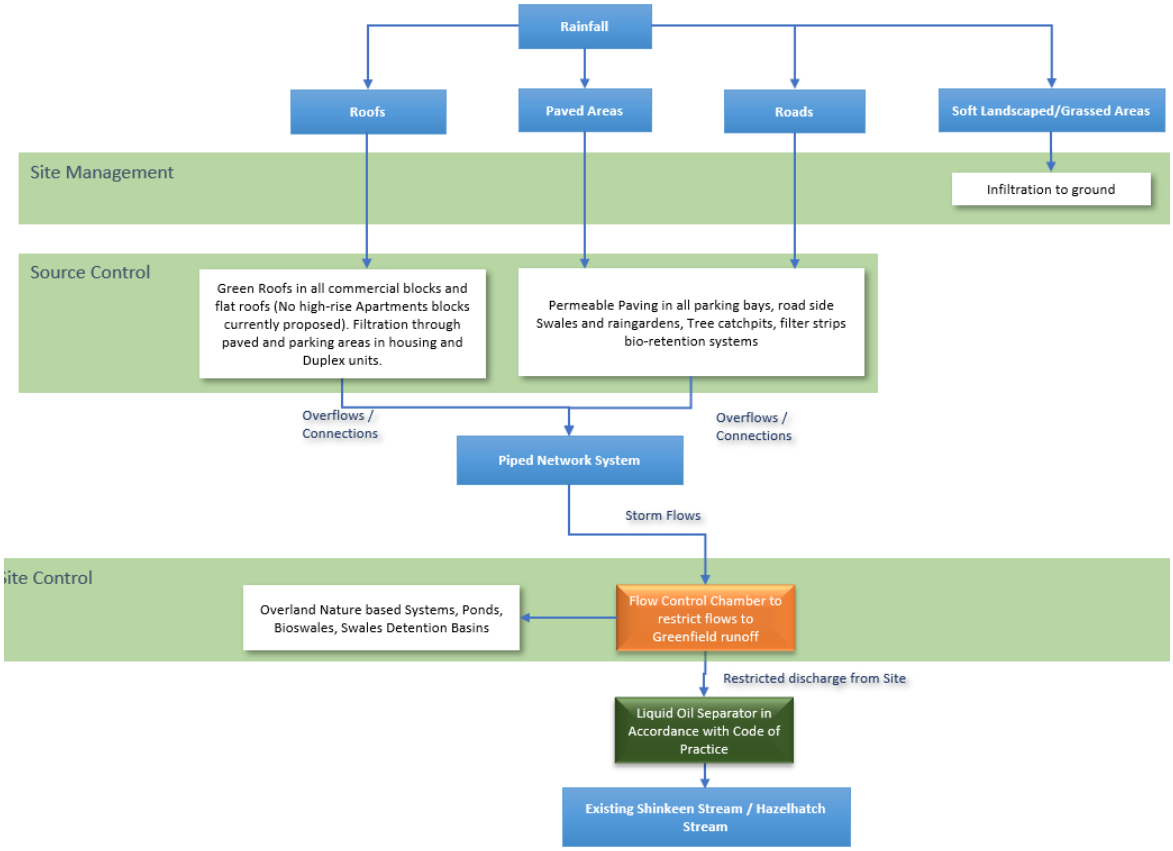


Figure 3-2 Proposed Treatment Terrain

Surface water runoff from the site's road network will be directed to the proposed pipe network via conventional road gullies where there are no adjacent open green areas. Where there are open green adjacent areas surface water shall overflow into open green areas via strategically placed dropped kerbs where there will be bio-swales installed to collect the surface water while surface water runoff from driveways will be captured by permeable paving. Both of these features will be fitted with an overflow to drain into the main pipe network. Refer to drawing 180221-DBFL-RD-SP-DR-C-3002 Road Section Details Sheet 1 & 180221-DBFL-RD-SP-DR-C-3002 Road Section Details Sheet 2 and below (figure 6) for details of the bio-swale.

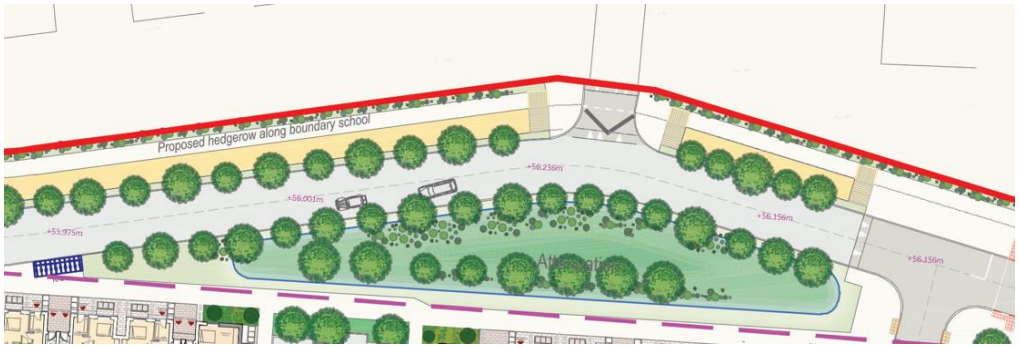


Figure 3-3 Proposed Treatment Terrain (dropped kerbs directly into bioswale).

3.4 General Description of Surface Water Design

The Watercourses (as described above in Section 3.2) is expected to provide a suitable surface water discharge point for the proposed development. Refer to DBFL Drawings 180221-DBFL-CS-SP-DR-C-1001 and 180221-DBFL-CS-SP-DR-C-1002 for proposed surface water outfall locations and details of the surface water outfall route.

Surface water discharge rates from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent) and water shall be retained primarily using the following method

- Nature based retention measures such as retention ponds, swales and overground detention basins.
- Filter Strips and rain gardens
- Tree pit catchments pits
- Roadside bioswales

Surface water discharge will also pass via an oil separators (sized in accordance with permitted discharge from the site). The proposed surface water drainage network will collect surface water runoff and convey towards the primary attenuation features, before discharging through the vortex-controlled flow control device and separator arrangement as noted above.

Surface water runoff from the site's road network will be directed to the proposed pipe network via conventional road gullies where there are no adjacent open green areas where there are open green areas. Direct storm water runoff will be provided into green/bioretention areas. Surface water runoff from driveways will be captured by permeable paving. Tree catch pits will also be used to for surface water run off but will have an overflow into the main gully and pipe network.

Surface water runoff from roofs will be primarily routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways (providing an additional element of attenuation). However, in some instances as noted in the drawing packages, rain gardens will be provided at the backs of some properties to act as a form of attenuation and biodiversity.

3.5 Compliance with Surface Water Drainage Policy

The management of surface water for the proposed development has been designed to comply with the policies and guidelines outlined in the Greater Dublin Strategic Drainage Study (GDSDS)

and with the requirements of Kildare County Council and the latest governmental advice. The guidelines require the development's stormwater network to address the following 4 main criteria

1. Criterion 1:

   River Water Quality Protection – Satisfied by providing interception storage and treatment of surface water run-off by SUDS features and nature based systems such as permeable paving of driveways, rain gardens, ponds, swales, detention basins and overland attenuation systems and full retention fuel / oil separators at surface water discharge points.

2. Criterion 2:

   River Regime Protection – Satisfied by attenuating surface water run-off in association with flow control devices prior to discharge off site at greenfield runoff rate. Site critical duration storm used to assess attenuation volume.

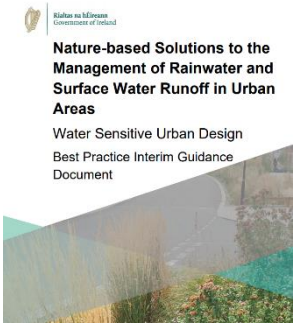
3. Criterion 3:

   Level of Service (Flooding) for the Site – A Site Specific Flood Risk Assessment has been prepared as part of this application. Reference should be made to Document M02182-01_DG01 Ballyoulster Lands, Celbridge, Co. Kildare FRA Rev 4. Hydraulic Modelling has been undertaken to ascertain that the proposed development is in line with the OPW Guidelines, Kildare SFRA and Kildare CC opinion included as part of Appendix E of this IDR.

4. Criterion 4:

   River Flood Protection – Satisfied by attenuating surface water discharge to greenfield runoff rates, addressing pluvial flood risk associated with the 1 in 100 year storm and avoiding development in flood plains. Reference should also be made to the SSFRA (Report Reference (M02182-01_DG01 Rev 4)

The design has also considered the latest policies and guidance documents in relation to nature based sustainable drainage systems most notably the latest Department of Housing, Local Government and Heritage guidance document 'Nature Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas'



3.6 Design Standards

Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Wastewater Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

3.6.1 Design Criteria:

- Return period for pipe work design — 5 years
- Return period for attenuation design — 100 years
- Allowable Outflow — 2.2 l/sec/ha
- Time of entry — 4 minutes
- M5 - 60 — 16.3 mm
- Ratio "r" — 0.277
- Pipe Friction (Ks) — 0.6 mm
- Minimum Velocity (based on pipe flowing full) — 1.0 m/s
- Rainfall Runoff from Roads and Footpaths — 95%
- Rainfall Runoff from Roofs (draining via SuDS feature) — 55%
- Rainfall Runoff from Driveways (draining via SuDS feature) — 55%
- Rainfall Depth Factored for Climate Change (as per GDSDS) — 20%

  (in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

Surface Water Network Design Calculations have been carried out using MicroDrainage WinDes analysis software and have been included as part of Appendix F – Storm Calculations.

3.7 SuDS

In accordance with the GDSDS it is proposed to use Sustainable Urban Drainage Systems (SUDS) for managing stormwater for the proposed development. The aim of the SUDS strategy for the site will be to;

- Attenuate storm-water runoff.
- Reduce storm-water runoff.
- Reduce pollution impact.
- Replicate the natural characteristics of rainfall runoff for the site.
- Recharge the groundwater profile

The proposed layout of the drainage and SUDS is detailed on drawing 180221 DBFL-CS-SP-DR-C-1001 & 1002 and drawing 180221-DBFL-SW-SP-DR-C-5011 and 180221-DBFL-SW-SP-DR-C-5012. Reference should also be made to drainage detail drawings 180221-DBFL-SW-SP-DR-C-5000-5003

An assessment of the potential SUDS that could be incorporated within the site was conducted using the SUDS Manual, CIRIA 753. The SUDS elements which were found applicable to the proposed scheme design and layout include the following:

1. Permeable paving driveways for all on-curtilage driveways. Some infiltration is possible across the site and the permeable driveways will also act to attenuate a volume of storage prior to discharge to the stormwater network through an overflow facility.
2. Overland nature based attenuation systems have been proposed for the entirety of the development. Due to the groundwater levels observed and which are further discussed in this chapter the overland drainage basins have been designed shallow with the exceptions of an open pond area within Site A.
3. The attenuation storage systems will be an on-line system for treatment of run-off. The storage systems will be designed to maximise water quality.
4. Bio-Swales and filter strips are provided where possible adjacent to roads.
5. Tree pits connected to gullies to be provided.
6. A petrol interceptor will be provided before surface water discharges to the attenuation areas where infiltration occurs.

The incorporation of the above SUDS elements will provide a sustainable manner in which to disperse surface water from the site, encourage groundwater recharge and provide treatment of run-off and subsequent improvement of discharge quality

3.8 Attenuation Calculation

Attenuation volumes have been calculated based on an allowable outflow / greenfield runoff rate of 2.2 l/sec/ha.

Run-off from the proposed development will be controlled / attenuated using vortex type flow control devices (Hydrobrake or equivalent).

Due to the topography and site layout, it is proposed that the site be divided in to 6no. catchments each containing an attenuated storage system (refer to figure 3.3 below and DBFL Drawings 180221-DBFL-SW-SP-DR-C-1301 – Storm Strategy - Catchments).

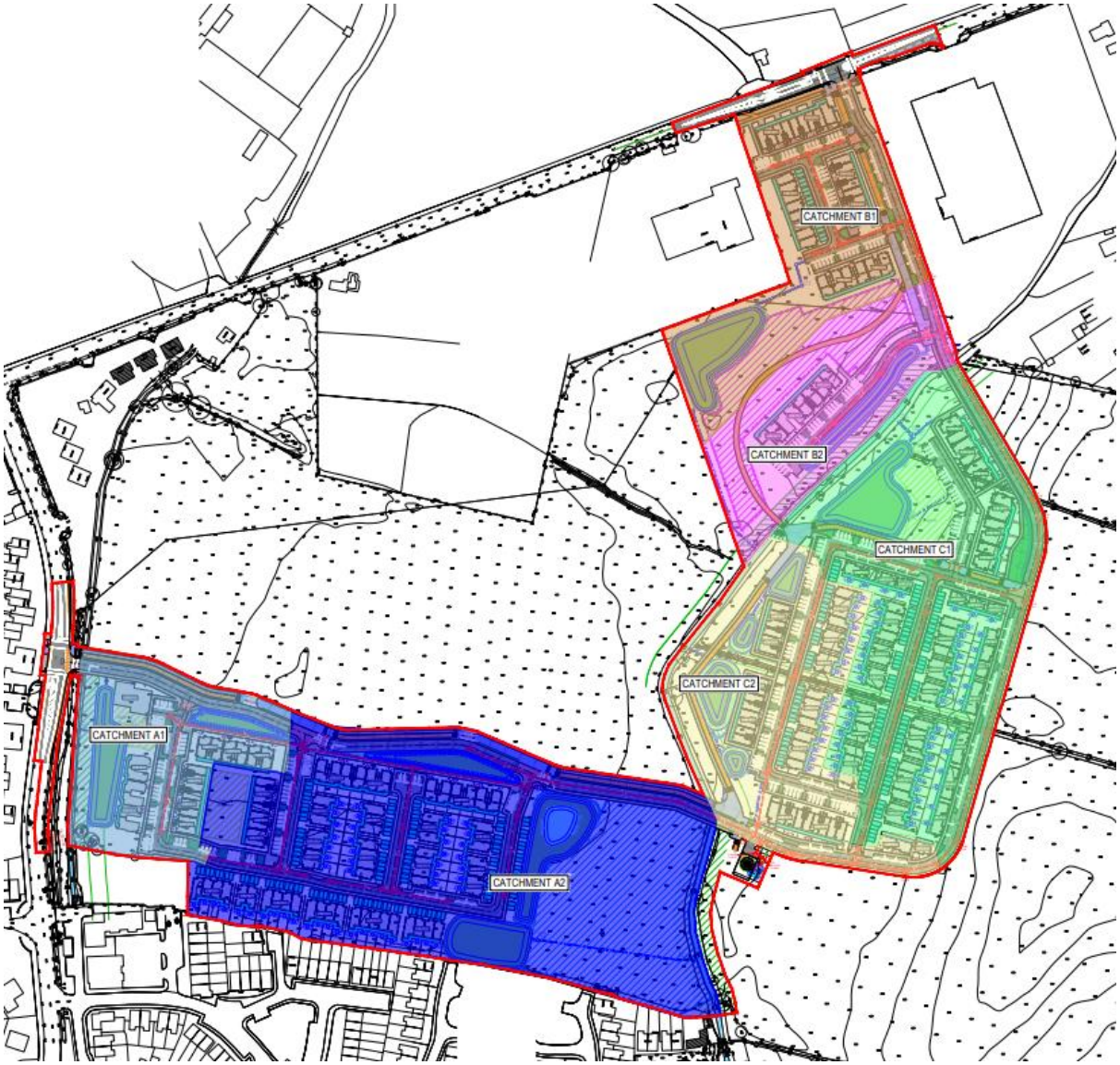


Figure 3-4: Catchment Areas

The resultant storage system types, discharge limits and storage volumes for each catchment are detailed in Table 2.

Catchment	Catchment Area (Total)	Impermeable Catchment Area (Total)	Allowable Outflow (Max.)	Restricted Discharge from site	Storage Volume Required (100 Yr. + CC)	Storage Volume Provided (100 Yr. +CC)
A1	*1.20 Ha*	*0.69 Ha*	*2.64l/s*	*2.64 l/s*	*420* m^3	*580* m^3
A2	*4.07 Ha*	*1.46 Ha*	*8.94 l/s*	*6.94 l/s*	*890* m^3	*960* m^3
B1	*1.57 Ha*	*0.68 Ha*	*3.45 l/s*	*3.45 l/s*	*420* m^3	*425* m^3
B2	*1.17 Ha*	*0.32 Ha*	*2.57 l/s*	*2.57 l/s*	*225* m^3	*251* m^3
C1	*2.91 Ha*	*1.34 Ha*	*6.41 l/s*	*6.41 l/s*	*880* m^3	*930* m^3
C2	*1.82 Ha*	*0.84 Ha*	*4.01 l/s*	*6.00 l/s*	*350* m^3	*372* m^3
TOTAL:	**12.74 Ha****	**5.39 Ha**	**28.03 l/s ***	**28.0*3* l/s**	**3185 m^3**	**3518 m^3**

****The site area is 13.4ha however this is inclusive of the site development works within the Dublin and Shinkeen roads which we are not proposing changing the drainage. Site area within the agricultural lands is 12.74 ha.**

***28.03 l/sec outflow for the total catchment areas is based on total site area being developed (12.74 Ha) at 2.2 l/sec/Ha.**

Table 2 - Surface Water Attenuation Storage and Discharge Limits

Note, required storage volume noted above includes a 20% factor for climate change.

Attenuation volumes have been calculated using MicroDrainage WinDes analysis software taking account of the depth and type of attenuation system. The calculations are included within Appendix F of this report.

In total 3518 m^3 of attenuation storage is provided which includes a 20% factor for Climate Change as noted in Section 3.2.3 and Table 3.1

The location of proposed attenuation systems is shown on 180221-DBFL-SW-SP-DR-C-1001 and 180221-DBFL-SW-SP-DR-C-1002. And Detailed Swale sections can be found in 180221-DBFL-SW-SP-DR-C-5011 & 180221-DBFL-SW-SP-DR-C-5012

As detailed within Chapter 1 IGSL Ltd undertook an extensive ground site investigation of subject lands comprising of a number of rotary cores, trial holes, infiltration tests and CBR tests are being undertaken along with a number of Ground Monitoring points.

3.9 Interception Volume

The GDSDS (Vol. 2, Table 6.3) requires interception storage to be incorporated into surface water drainage design in order to limit discharge of sediment and pollutants into the downstream surface water drainage network and receiving water courses.

This interception storage is designed to capture surface water run-off from rainfall depths of 5mm (and up to 10mm if possible).

The SuDS features included in the development (refer to Section 3.2.4) will provide the necessary interception volume required by the GDSDS (within stone reservoirs beneath permeable paved driveways and surface water runoff from roads being intercepted by the tree pits, bio retention areas, ponds and detention basins).

3.10 Flood Risk

A separate Site-Specific Flood Risk Assessment has been prepared as part of this planning application (refer to McCloy Consulting Engineers Report No. M02182-01-DG01 Rev 4)

3.11 Surface Water Quality Impact

The type of development is low risk i.e. it does not present a high risk of run-off contamination.

The development's design and layout further reduce the risk of contaminants entering the surface water network as the majority of the first flush runoff will be intercepted through swales, bioretention areas and detention basins. Run-off rates from the site are controlled by flow control devices. Surface water management proposals for the development also incorporate the following impact reduction measures;

- Surface water network designed in accordance with GDSDS requirements
- Incorporates SUDS features e.g., permeable paving in the higher risk parking areas at the front of houses (i.e., treatment / filtration provided within the stone reservoir beneath permeable paved driveways)

- Surface water attenuation in the form of tree pits, swales, ponds bioretention areas and detention basins, in conjunction with a final Class 1 fuel / oil separator prior to discharge to the outfall streams.

In this way it is considered that the development provides treatment of collected run-off, provides a SuDS treatment train approach and is low risk of pollutants. The proposed surface water system has therefore been designed to incorporate SuDS techniques which naturally reduce pollutants and improve water quality.

3.12 Groundwater

Standpipes were installed in eight locations to facilitate monitoring of water levels. The construction details of the installations are shown in figure 5. Also included in figure 5 are the depth to water on 13th Jan 2022. Data loggers were installed in coreholes RC01 to RC08 in order to continuously monitor the variations in groundwater level with time. The loggers remained in place from 20th January to 9th May 2022.

Location	Depth (m bgl)	Gravel pack	Bentonite Seal	Concrete Cap	Response Zone (50mm)	Depth to water 13/01/2022 (m bgl)
RC01	4.3	4.3 to 1.0	1.0 to 0.5	0.5 to GL	4.3 to 1.0	2.67
RC02	6.0	6.0 to 1.0	1.0 to 0.5	0.5 to GL	6.0 to 1.0	0.54
RC03	5.5	5.5 to 1.0	1.0 to 0.5	0.5 to GL	5.5 to 1.0	1.53
RC04	8.0	8.0 to 1.0	1.0 to 0.5	0.5 to GL	8.0 to 1.0	2.60
RC05	7.0	7.0 to 1.0	1.0 to 0.6	0.5 to GL	7.0 to 1.0	2.02
RC06	5.6	5.6 to 1.0	1.0 to 0.7	0.5 to GL	5.6 to 1.0	1.40
RC07	8.0	8.0 to 1.0	1.0 to 0.8	0.5 to GL	8.0 to 1.0	1.88
RC08	7.0	7.0 to 1.0	1.0 to 0.9	0.5 to GL	7.0 to 1.0	3.95

Table 4 – Summary of Groundwater Monitoring (13/01/2022)

Figure 3-5 – Summary of Groundwater Monitoring (13th Jan 2022 Source IGSL Ground Site Investigation report)

The data loggers show that the depth of water was mostly in the range 1.5 to 2.5 m BGL during the monitoring period. However, a sharp rise in water levels was observed in mid to late February, attributed to exceptionally high rainfall intensity. During this period, water levels rose to less than

a metre below ground level (bgl) in 4 locations; RC02, 03, 06 and 08 respectively and are identified in figure 6 below.

The results of these monitoring wells have informed our design to ensure that no large attenuation features were placed in these areas and where it was not possible to avoid detention basins and swales were designed to not interfere with the groundwater and are placed at minimum no more than 500mm below ground level.

The remaining monitoring wells recorded groundwater up to 1.5m but on average were 2m below ground level. Reference should be made the site investigation report. All remaining site wide attenuation features are no greater than 1.5m BGL. Reference should be made to drawing 180221-DBFL-EW-SP-DR-C-9050 for details of the site investigation and standpipes.

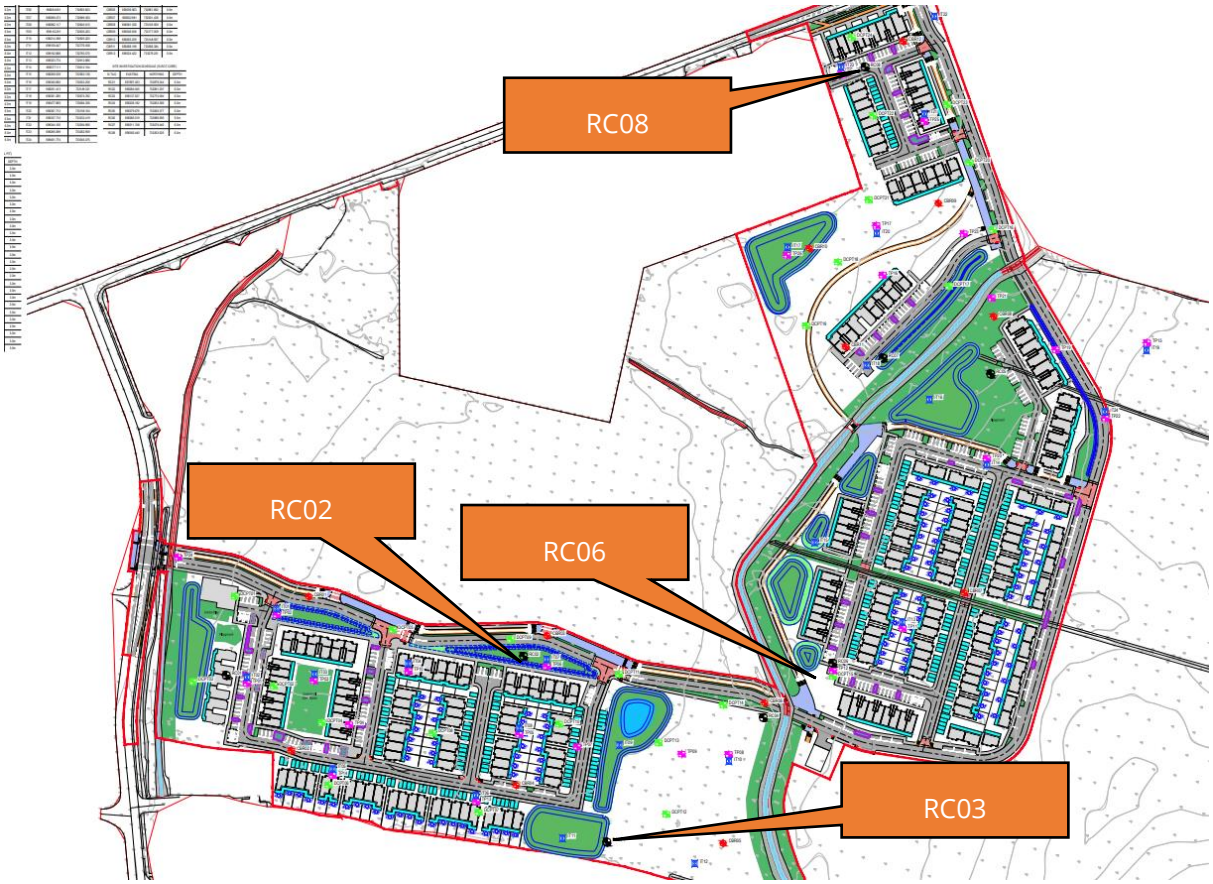


Figure 3-6 Groundwater Monitoring Locations for the 4no standpipes which recorded ground water less that 1m BGL.

The table below summarises the nearest attenuation features, respectively.

Table 3 Groundwater depths against nearest attenuation features

Rotary Core / Monitoring well	Depth to base of nearest attenuation feature below ground level (m)	Highest ground Water Level depth recorded during period below ground level. (m) (Mid feb 2022)	Average Ground Water level (m) recorded over duration period below ground level
RC01	0.65m	2.1m	3.0
RC02	0.0 (basin depth 0.3m above ground level all levels raised)	0.3m	1.5
RC03	0.4m	0.75m	2.0
RC04	1.0m	1.9m	2.6
RC05	1.0m	1.3m	2.4
RC06	0.5m	0.65m	1.4
RC07	0.2m	1.25m	2.0
RC08	N/A (Considered not near any attenuation structure)	0.9m	2.0

Table 4 Groundwater depths against nearest attenuation features

As can be noted all attenuation features proposed are designed to not interfere with the groundwater levels within the site.

4 Foul Drainage

4.1 Existing Foul Drainage

A Confirmation of Feasibility from Irish Water has been received and Irish Water have confirmed both a wastewater and water connection are feasible subject to upgrades. Reference should be made to Appendix C.

The Confirmation of Feasibility confirms that Irish Water's Capital Investment Plan includes for projects in the Celbridge and Lower Liffey Valley Catchment which will provide long term strategic solutions and ensure sufficient capacity for the proposed development. Two such capital projects include the:

- Primrose Hill WwPS Project
- New gravity sewer extension conveying flow from the edge of the site boundary along the Shinkeen Road and Hazelhatch Roads and to a proposed outfall manhole located upstream of Primrose Pumping Station (figure 4.1)

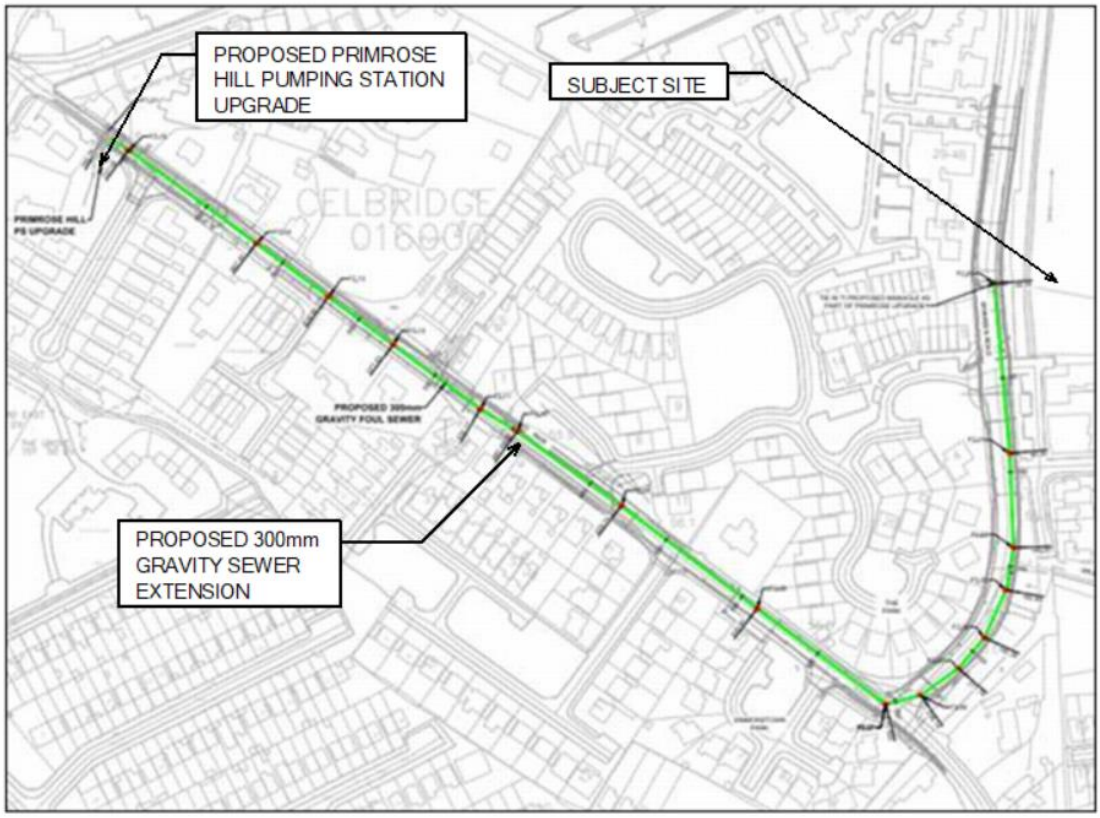


Figure 4.1 extract from Irish Water's Capital Network Upgrade Plan.

The Primrose Hill pumping station project is due to be complete in Q4 of 2023 while the gravity sewer upgrade is scheduled to be complete by 2025. Correspondence with Irish water have been conducted to obtain further details and timeframes for the delivery of the gravity sewer.

Irish Water provided the upgrade plans (as shown in Figure 4.1) which confirm the extent of works to be completed up to the subject site and allow for the connection to the site. The upgrade works can be delivered in a timely manner as they are to be delivered by or on behalf of Irish Water and whilst it would be preferential if the gravity sewer programme could be brought forward to match that of the Primrose Hill pumping station project, however, a programme of delivery for the gravity sewer by 2025 would be in line with the delivery of the first phase of units in the Ballyoulster SHD assuming a 6 month pre-construction phase and an 18 month construction time frame Reference should be made to Section 1.7 of the IDR for phasing requirements.

The proposed gravity sewer extension forms part of Irish Waters capital delivery programme and thus costs included as part of these capital works are included in the standard connection fee, DBFL have confirmed with Irish Water that no other planning or other third party consents are required to deliver the infrastructure

This proposed infrastructure is expected to provide a suitable foul discharge point for the proposed development as confirmed by Irish Water in their Confirmation of Feasibility and Statement of Design Acceptance (refer to Appendix C).

4.2 Design Strategy

The proposed foul drainage network within the development has been designed in compliance with Irish Water's Code of Practice for Wastewater Infrastructure. As noted earlier, the topography of the site is largely flat. Consequently, a new strategic foul pumping station for the site and for future development lands will be provided. Therefore, a foul rising main and associated pumping station and rising main discharge (header) manhole will be required to service the entire development lands. This is presented on DBFL drawing series 180221-DBFL-CS-SP-DR-C-1011 and 1012.

The proposed foul pumping station is to be located in the central area of the developed lands on the western side of the Shinkeen Watercourse (in accordance with the requirements of Irish Water Code of Practice for Wastewater Infrastructure) and constructed in accordance with Irish Water Standard Details. It will accommodate 24 hours of emergency storage as agreed with Irish Water. A rising main will pump forward flows to the proposed new gravity network on the Shinkeen

Stream and discharge (header) manhole shall be located upstream of the new gravity network (constructed in accordance with Irish Water Standard Details).

The proposed foul drainage network comprises of a series of 225/300mm diameter pipes, discharging to the pumping station described above. Each residential unit is serviced by individual 100mm diameter connections in accordance with Irish Waters Code of Practice for Wastewater. Refer to DBFL Drawing Series 180221-DBFL-FW-SP-DR-C-1100 for the proposed foul drainage layout.

The proposed foul drainage discharge point is located adjacent to the South Western corner of the site (refer to Figure 4.1) and drawings 180221-DBFL-FW-SP-DR-C-1100, & 180221-DBFL-FW-SP-DR-C-1101. DBFL have been in contact with Irish Water Asset Planning Department to confirm the levels of the proposed gravity sewer that will allow a discharge to the Primrose Pumping Station.

Irish Water have issued a Statement of Design Acceptance for the proposals which is included within Appendix C of this Report. Reference should also be made to drawings 180221-DBFL-FW-SP-DR-C-1100, 180221-DBFL-FW-SP-DR-C-1101, 180221-DBFL-FW-SP-DR-C-1102 details the plans layouts, drawings 180221-DBFL-FW-SP-M2-C-3, 100, 180221-DBFL-FW-SP-M2-C-3101, 180221-DBFL-FW-SP-M2-C-3102 and 180221-DBFL-FW-SP-M2-C-3102 detailing the longsections and finally drawings 180221-DBFL-FW-SP-DR-C-9420, & 180221-DBFL-FW-SP-DR-C-5101 detailing proposed pumping station and typical details.

4.3 Design Calculations

The foul drainage network for the proposed development has been designed in accordance with the following guidelines:

- Irish Water Code of Practice for Wastewater Infrastructure
- Department of the Environment's Recommendations for Site Development Works for Housing Areas
- Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal"
- BS EN 752: 2008 Drain and Sewer Systems Outside Buildings
- IS EN 12056: Part 2 (2000) Gravity Drainage Systems Inside Buildings

Foul drainage network calculations for the proposed development have been carried out using MicroDrainage WinDes analysis software.

Design Criteria:

Demand	446 l/dwelling/day
Discharge units	14 units per house (as BS8301)
Pipe Friction (Ks)	1.5 mm
Minimum Velocity	0.75 m/s (self-cleansing velocity)
Maximum Velocity	3.0 m/s (1:18 maximum pipe gradient)
Frequency Factor	0.5 for domestic use

Residential Dwellings

Wastewater Discharge Calculation

(As outlined in Irish Water's Pre-Connection Enquiry Application Form)

Dry Weather Flow	446 l/dwelling /day
No. of Dwellings	344
Post Development Average Discharge	1.63 l/sec
Post Development Peak Discharge *(6 X DWF)*	9.81 l/sec
Daily Foul Discharge Volume (446l per dwelling)	141,240 l

Non-Residential i.e., Creche

Wastewater Discharge Calculation

(As outlined in Irish Water's Pre-Connection Enquiry Application Form)

Assumed Occupancy (persons)	25
Flow Rate / Person / Day (litres)	60
(Based on IW Code of Practice for Wastewater	
Infrastructure – Appendix D, Flow Rates for Design)	
Post Development Average Discharge	0.2 l

(Based on 8-hour occupancy)

Post Development Peak Discharge, *(3 X DWF)*	0.6 l
Daily Foul Discharge Volume *(60 l per person)*	1624 l

Total Wastewater Discharge

Post Development Peak Discharge	9.92 l/sec
Daily Foul Discharge Volume	142,864 l

4.4 Strategic Foul Pumping Station

The proposed foul pumping station has been sized on the basis of accommodating the entire development lands including for future schools to the north of the development. The following has been used.

Residential Dwellings

Wastewater Discharge Calculation

(as outlined in Irish Water's Pre-Connection Enquiry Application Form)

Dry Weather Flow	446 l/dwelling /day
No. of Dwellings	1200
Post Development Average Discharge	6.19/sec
Post Development Peak Discharge *(6 X DWF)*	37.13 l/sec
Daily Foul Discharge Volume (446l per dwelling)	534,633 l

Non-Residential i.e., Creche

Wastewater Discharge Calculation

(As outlined in Irish Water's Pre-Connection Enquiry Application Form)

Assumed Occupancy (persons)	25
Flow Rate / Person / Day (litres)	60 l

(Based on IW Code of Practice for Wastewater

Infrastructure – Appendix D, Flow Rates for Design)	
Post Development Average Discharge	0.2 l/s
(based on 8 hour occupancy)	
Post Development Peak Discharge *(3 X DWF)*	0.6 l/s
Daily Foul Discharge Volume *(60 l per person)*	1624 l

Non-Residential i.e. Schools (estimated 1050 Pupils 150 staff)

Wastewater Discharge Calculation	
(as outlined in Irish Water's Pre-Connection Enquiry Application Form)	
Assumed Occupancy (persons)	1200
Flow Rate / Person / Day (litres)	60
(Based on IW Code of Practice for Wastewater	
Infrastructure – Appendix D, Flow Rates for Design)	
Post Development Average Discharge	0.83 l/s
(based on 8 hour occupancy)	
Post Development Peak Discharge *(6 X DWF)*	2.5 l/s
Daily Foul Discharge Volume (50l per person)	107,892l

Total Wastewater Discharge

Post Development Peak Discharge	39.69 l/s
Daily Foul Discharge Volume	608,305 l

5 Water Supply and Distribution

5.1 Existing Public Watermains

Celbridge is connected to the water supply scheme servicing North Kildare. The water supply scheme is serviced by the Ballygoran Reservoir, which can be supplied by both the Ballymore Eustace and Leixlip Water Treatment Plants. Existing Irish Water watermains in the immediate area include a 200mm Ductile Iron pipe to the north along the Dublin Road (R403).

A Pre-Connection Enquiry Feedback has been received from Irish Water (included in Appendix C) confirming that 'a water connection is feasible with network upgrades". It is understanding that these works will not require planning permission and can be undertaken outside of third party lands (i.e. within public roads).

In order to accommodate the works Irish Water have advised an upgrade is required on the existing network resulting in approximately 400m of new 200mm watermain extension approximately 3km away from the proposed development and the removal of an existing 150mm diameter sewer.

Irish water have advised that this upgrade works is not currently on the planned capital works programme and as such should a connection be made Irish water will require a contribution from the development to facilitate these works. The upgrade works will be carried out by Irish Water under their exempted development powers and will be paid for by the applicant. The upgrade works can be delivered in a timely manner, DBFL have confirmed with Irish Water that the upgrade works do not need planning permission and are located within public roads/verges. Following a grant of permission, Irish Water will confirm the cost the applicant is to pay, which is completed as part of the Connection Application process.

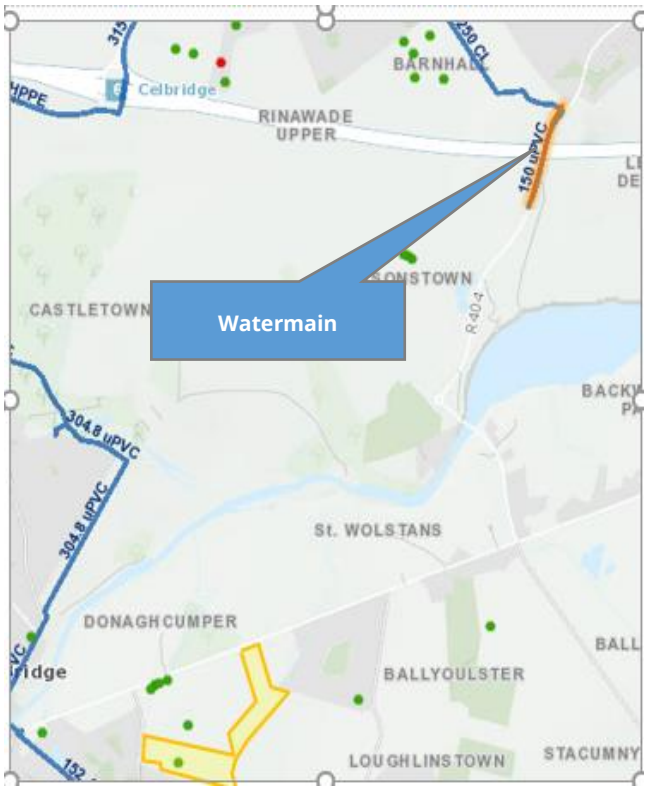


Figure 5-1 Extract from Irish Water Network Plan (watermain extension highlighted in orange estimated).

(Site Boundary Indicative)

5.2 Proposed Watermain Layout

Irish Water have issued a Statement of Design Acceptance for the proposals which is included within Appendix C of this Report. Reference should also be made to DBFL Drawing No's 180221-DBFL-WM-SP-DR-C-1041 and DBFL-WM-SP-DR-C-1042

It is proposed to take a 200mm diameter connection off the proposed 225mm diameter public water supply line (located along the R403).

A series of 200mm and 160mm diameter looped water mains will be provided (generally along the site's arterial roads) with a number of 110mm diameters looped branch mains provided elsewhere.The proposed water main layout and connections to existing public water mains have been designed in accordance with Irish Water Standard Detail STD-W-02.

Sluice Valves have been arranged in accordance with Irish Water Standard Detail STD-W-02, Note 6 ("valves shall be arranged in such a manner to allow the network to be managed to ensure that no more than 40 properties lose water from a burst on the system, at any one time").

Individual houses will have their own connections (25mm O.D. PE pipe) to distribution water mains via service connections and meter / boundary boxes.

Individual connections are to be installed in accordance with Irish Water Standard Detail STD-W-03.

5.3 Hydrants

The proposed water main layout is arranged such that all buildings are a maximum of 46.0m from a hydrant in accordance with the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety".

Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Irish Water's Code of Practice and Standard Details.

5.4 Materials

Proposed water mains and connections to individual houses are to be PE100 SDR17.

5.5 Water Demand Calculations

Water Demand has been calculated in accordance with the guidelines outlined in Irish Water's Pre-Connection Enquiry Application Form:

Residential Dwellings

- No. of Housing Units 344
- Average Occupancy Ration (Persons Per Dwelling) 2.7
- Per-Capita Consumption (l/person/day) 150
- Average Domestic Daily Demand (l/sec) 1.61
- Post Development Average Hour Water Demand (l/sec) 2.02 l/s

  (1.25 x Average Domestic Daily Demand)
- Post Development Peak Hour Water Demand (l/sec) 10.08 l/s

  (5.0 x Post Development Average Hour Water Demand)

Non-Residential i.e. Creche

- Assumed occupancy (persons) 40
- Per-Capita Consumption (l/person/day) 50

  (Based on IW Code of Practice for Wastewater

  Infrastructure – Appendix D, Flow Rates for Design)
- Average Daily Demand (l/sec) 0.02 l/s

  (Based on 8-hour occupancy)
- Post Development Average Hour Water Demand (l/sec) 0.02 l/s

  (1.25 x Average Daily Demand)
- Post Development Peak Hour Water Demand (l/sec) 0.107 l/s

  (5.0 x Post Development Average Hour Water Demand)

Total Water Demand

Post Development Average Hour Water Demand 1.88 l/s

Post Development Peak Hour Water Demand 9.395 l/s

Individual houses will provide water storage in header tanks (in accordance with the requirements of Irish Water's Code of Practice) and include provision of water conservation measures such as dual flush water cisterns and low flow taps.

Appendix A : Existing Records

SHEET 5

SHEET 4

A3

SHEET 3

A3

SHEET 6

SHEET 2

SHEET 1

SHEET 7

Rock Bridge

Ballycoulster Park

Public Road

St. Wolstan's Abbey

Simmonstown Park

Rose Bawn Farm

Willow Park

Primrose Gate

WILLOW AVENUE

WILLOW GROVE

WILLOW PARK ROAD

WILLOW BANK

The Square

ESB Networks

TITLE:

20200702-057_A0

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 02-Jul-2020

** SCALE: 1:1500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1850 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING:
(A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

X,Y: 297440, 233486

X,Y: 299179, 233486

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A0 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

DONAGHCUMPER

INNOTHERA

U S F JOHNSON

BALLYOUSTER N

BALLYOUSTER NO1

BALLYOUSTER NO2

BALLYOUSTER NO5

BALLYOUSTER

LOUGHLINSTOWN

ELMHALL NH

CELBRIDGE
016000

ST PATRICKS SCH

2 X 50 ABC

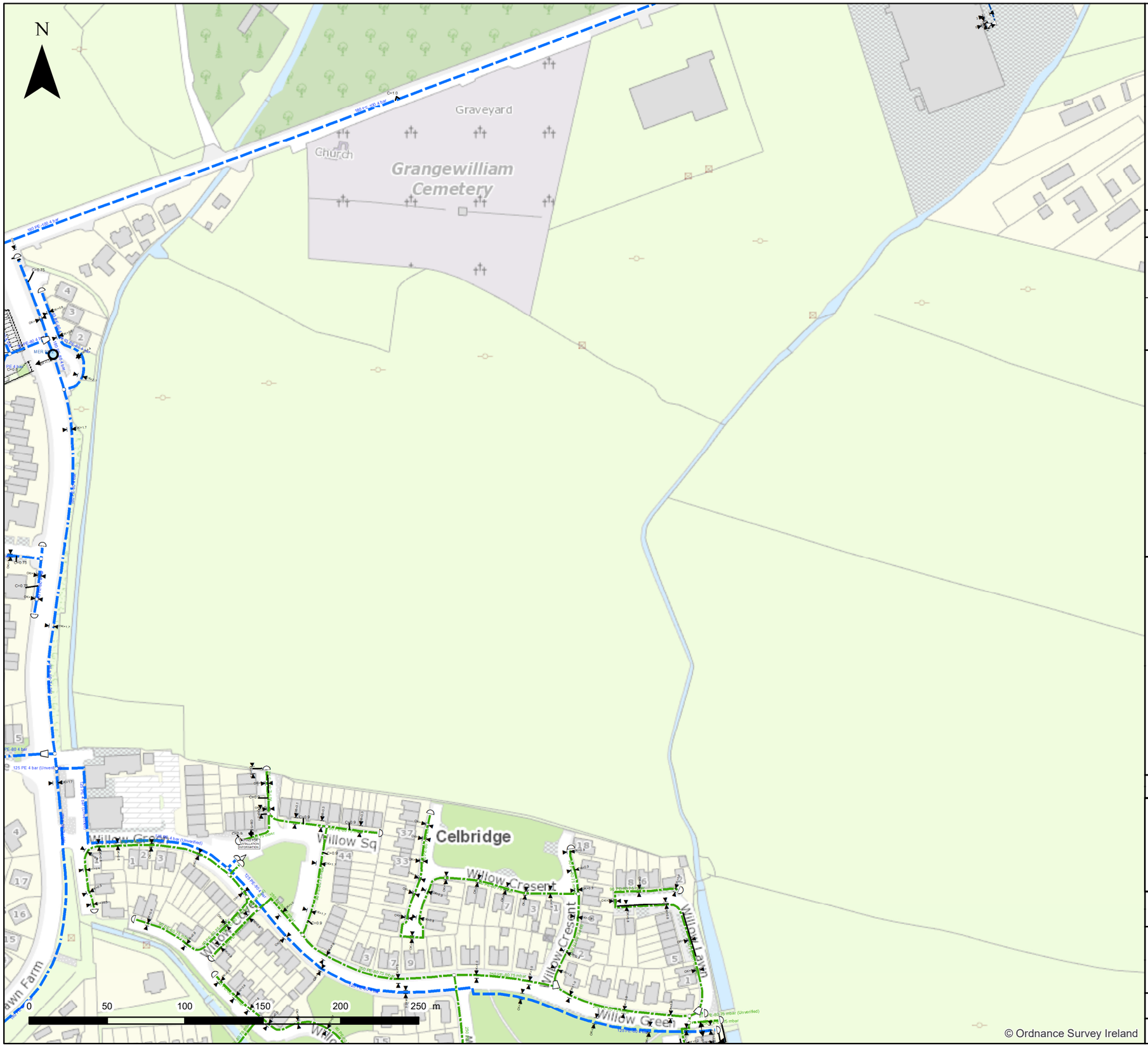
3X1/185 XLP
3 X 150MM DUCT
4 X DUCT

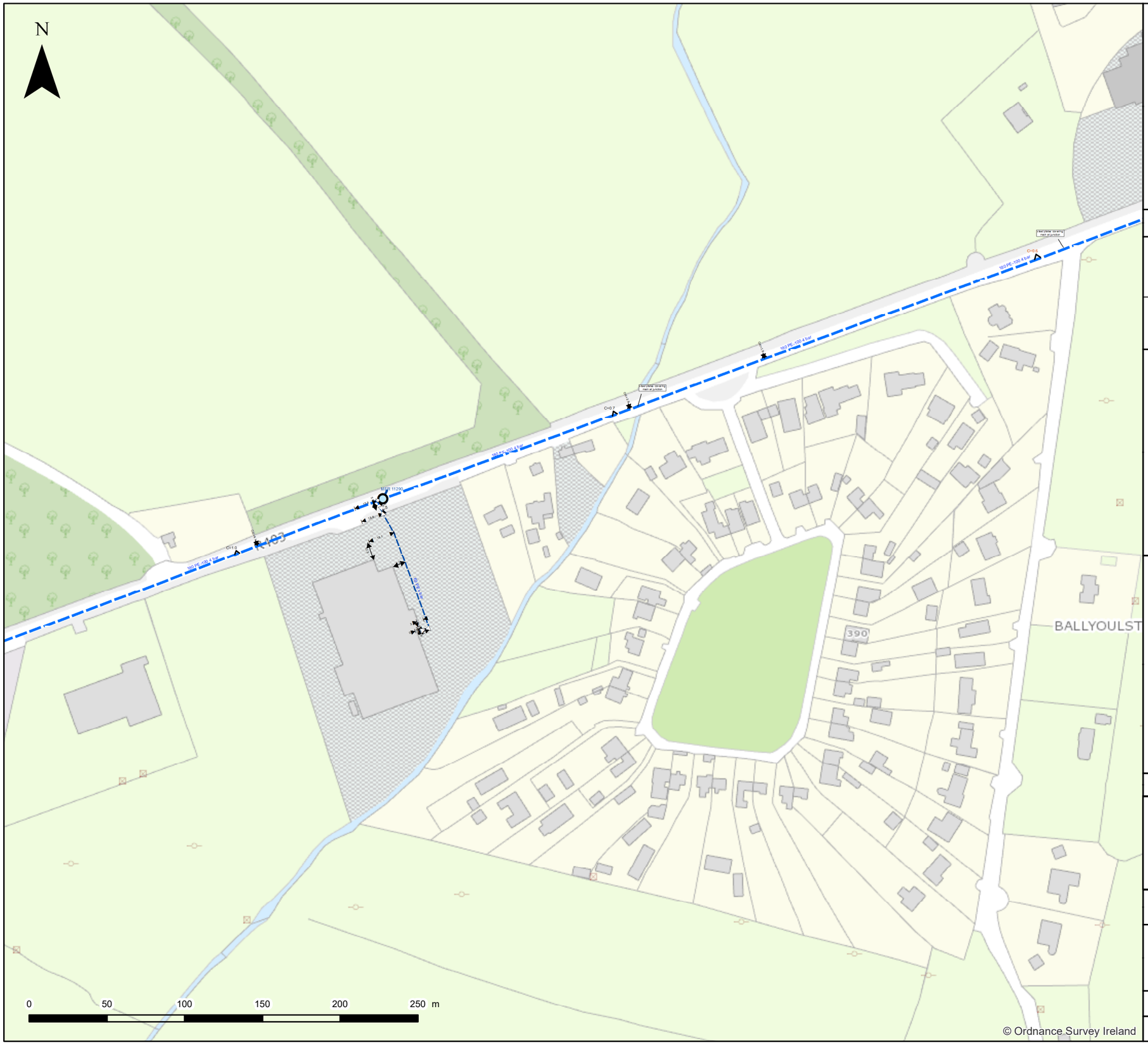
4X185 XLP

25/16 AYCY

PLEASE NOTE THAT THERE ARE: HIGH VOLTAGE (38KV AND HIGHER VOLTAGES) OVERHEAD LINES AND UNDERGROUND CABLES ON THIS MAP. IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT THE DESIGNATED PARTIES (PLEASE SEE ENCLOSED SHEET) IN ADVANCE OF THE WORKS

X,Y: 299179, 232332


N
Graveyard
Church
Grangewilliam Cemetery
Celbridge
Willow Sq
Willow Crescent
Willow Green
Willow Lawn
Willow Park
Willow Park Rd
Willow Park Ct
Willow Park Grove
Willow Park Manor
Willow Park Pl
Willow Park Rise
Willow Park Wood
Willow Park Walk
Willow Park Way
Willow Park Close
Willow Park Drive
Willow Park Avenue
Willow Park Gardens
Willow Park Terrace
Willow Park Crescent
Willow Park Square
Willow Park Lane
Willow Park Road
Willow Park Court
Willow Park Grove
Willow Park Manor
Willow Park Place



Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1850 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 289 389) or can be downloaded at www.hsa.ie.

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- Aurora Telecom Duct
- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926166 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1850 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1850-427747 for specific information

DIAL BEFORE YOU DIG 1850 42 77 47
In Emergency call 1850 20 50 50 Gas Networks Ireland

Gas Networks Ireland

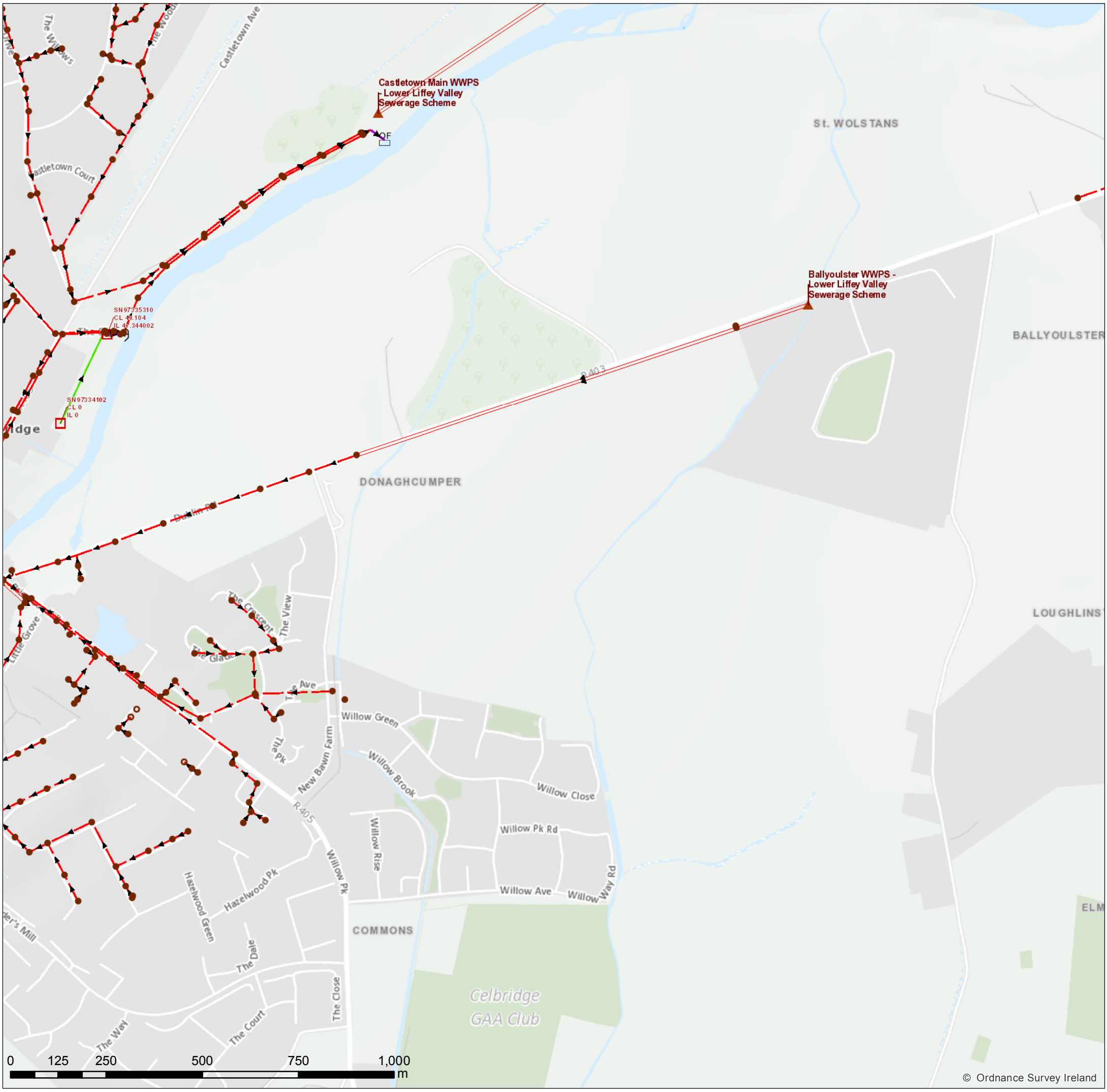
GAS NETWORK INFORMATION

Description:

Location: 698540,733337

Plot Date: 02/07/2020 10:45	Scale: 2500 @ A3
Plotted By: 988	Ref ID: *988_02072020104558*

Irish Water Web Map



Water Distribution Network
- Water Treatment Plant
- Water Pump Station
- Storage Cell/Tower
- Dosing Point
- Meter Station
- Abstraction Point
- Telemetry Kiosk

Reservoir
- Potable
- Raw Water

Water Distribution Mains
- Irish Water
- Private

Trunk Water Mains
- Irish Water
- Private

Water Lateral Lines
- Irish Water
- Non IW
- Water Casings
- Water Abandoned Lines
- Boundary Meter
- Bulk/Check Meter
- Group Scheme
- Source Meter
- Waste Meter
- Unknown Meter ; Other Meter
- Non-Return
- PRV
- PSV
- Sluice Line Valve Open/Closed
- Butterfly Line Valve Open/Closed
- Sluice Boundary Valve Open/Closed
- Butterfly Boundary Valve Open/Closed
- Scour Valves
- Single Air Control Valve
- Double Air Control Valve
- Water Stop Valves
- Water Service Connections
- Water Distribution Chambers
- Water Network Junctions
- Pressure Monitoring Point
- Fire Hydrant
- Fire Hydrant/Washout

Water Fittings
- Cap
- Reducer
- Tap
- Other Fittings

Sewer Foul Combined Network
- Waste Water Treatment Plant
- Waste Water Pump station

Sewer Mains Irish Water
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

Sewer Mains Private
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

Sewer Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Discharge Type
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

Cleanout Type
- Rodding Eye
- Flushing Structure
- Other; Unknown

Sewer Inlets
- Catchpit
- Gully
- Standard
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Storm Water Network

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Inlet Type
- Gully
- Standard
- Other; Unknown

Storm Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Stormwater Chambers

Discharge Type
- Outfall
- Overflow
- Soakaway
- Other; Unknown

Gas Networks Ireland
- Transmission High Pressure Gasline
- Distribution Medium Pressure Gasline
- Distribution Low Pressure Gasline

ESB Networks

ESB HV Lines
- HV Underground
- HV Overhead
- HV Abandoned

ESB MVLV Lines
- MV Overhead Three Phase
- MV Overhead Single Phase
- LV Overhead Three Phase
- LV Overhead Single Phase
- MVLV Underground
- Abandoned

Non Service Categories
- Proposed
- Under Construction
- Out of Service
- Decommissioned

Water Non Service Assets
- Water Point Feature
- Water Pipe
- Water Structure

Waste Non Service Assets
- Waste Point Feature
- Sewer
- Waste Structure

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Service connection pipes are not generally shown but their presence should be anticipated.

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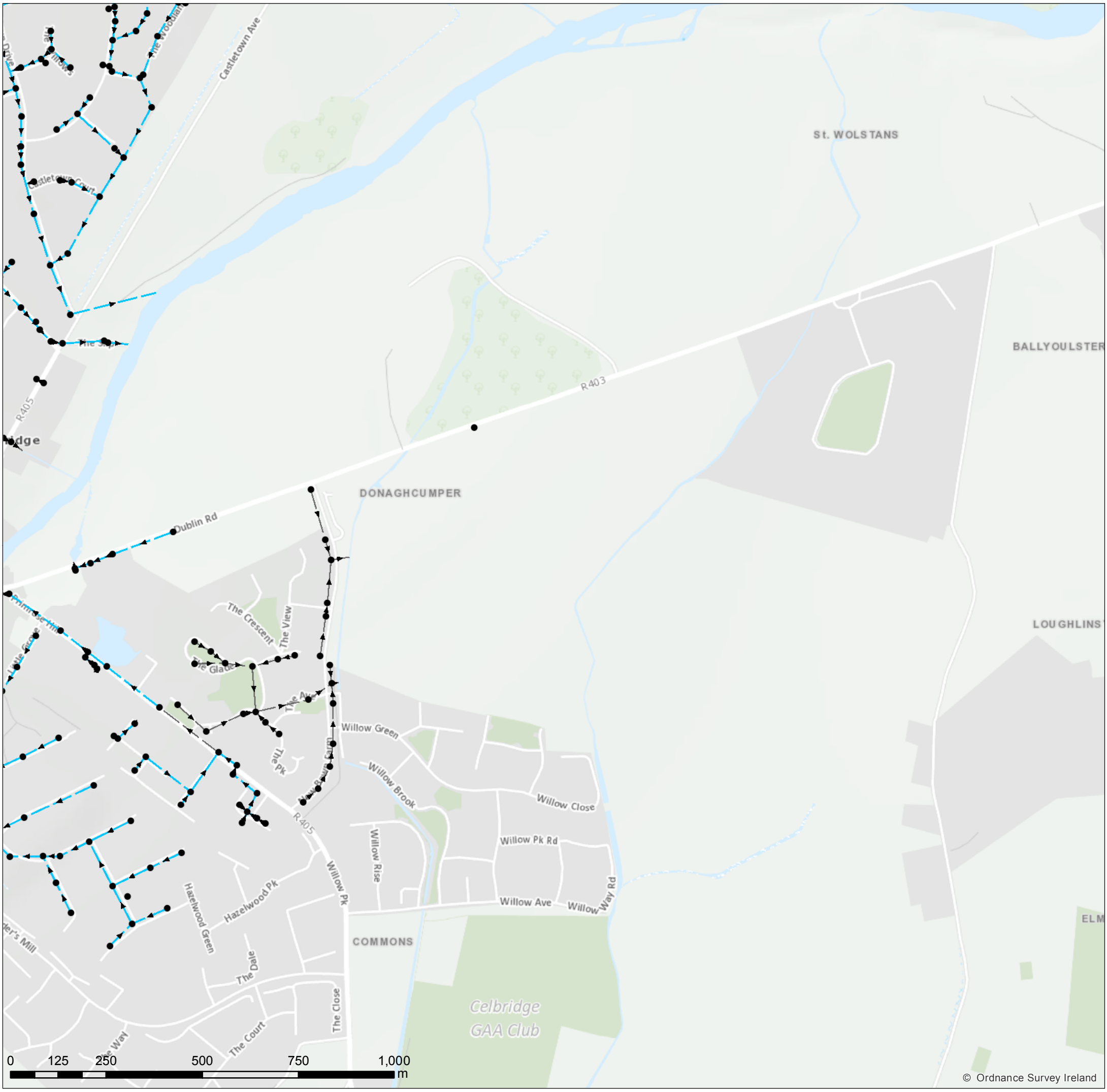
UISCE ÉIREANN : IRISH WATER

Print Date: 03/07/2020

Printed by:Irish Water

Irish Water Web Map



Water Distribution Network
- Water Treatment Plant
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- Dosing Point
- Meter Station
- Abstraction Point
- Telemetry Kiosk

Reservoir
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- Irish Water
- Private

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- Irish Water
- Private

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- Irish Water
- Non IW
- Water Casings
- Water Abandoned Lines
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- Group Scheme
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- Waste Meter
- Unknown Meter ; Other Meter
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- Water Stop Valves
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- Water Distribution Chambers
- Water Network Junctions
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- Fire Hydrant/Washout

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- Reducer
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- Waste Water Treatment Plant
- Waste Water Pump station

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- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

Sewer Mains Private
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

Sewer Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Discharge Type
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

Cleanout Type
- Rodding Eye
- Flushing Structure
- Other; Unknown

Sewer Inlets
- Catchpit
- Gully
- Standard
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Storm Water Network

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Inlet Type
- Gully
- Standard
- Other; Unknown

Storm Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Stormwater Chambers

Discharge Type
- Outfall
- Overflow
- Soakaway
- Other; Unknown

Gas Networks Ireland
- Transmission High Pressure Gasline
- Distribution Medium Pressure Gasline
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ESB Networks

ESB HV Lines
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- HV Overhead
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ESB MVLV Lines
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- MV Overhead Single Phase
- LV Overhead Three Phase
- LV Overhead Single Phase
- MVLV Underground
- Abandoned

Non Service Categories
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- Out of Service
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Water Non Service Assets
- Water Point Feature
- Water Pipe
- Water Structure

Waste Non Service Assets
- Waste Point Feature
- Sewer
- Waste Structure

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UISCE ÉIREANN : IRISH WATER

Print Date: 03/07/2020

Printed by:Irish Water

Irish Water Web Map

UISCE ÉIREANN - IRISH WATER

Print Date: 06/07/2020

Printed by:Irish Water

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Irish Water Web Map

UISCE ÉIREANN / IRISH WATER

Print Date: 06/07/2020

Printed by:Irish Water

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A3

WILLOW SQUARE
WILLOW CRESENT
WILLOW COVE
WILLOW GREEN
WILLOW BROOK
WILLOW VIEW
WILLOW CLOSE
WILLOW PARK ROAD
WILLOW DRIVE
WILLOW GROVE
WILLOW WAY ROAD
WILLOW BANK
WILLOW AVENUE
New Bawn Farm
Primrose Gate
Willow Park
The Square
Primary School
110kv

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https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Date 02/07/2020

Irish National Grid Co-Ordinates
Centre XY: 298184 m, 232519 m

emaps CBYD

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A3

St. Wolstan's Abbey

Willow Park

Simmonstown Park

New Bawn Farm

WILLOW SQUARE

WILLOW CRESCENT

WILLOW COURT

WILLOW GREEN

Shinkeen Stream

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https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 298053 m, 232786 m

Date
02/07/2020

emaps CBYD

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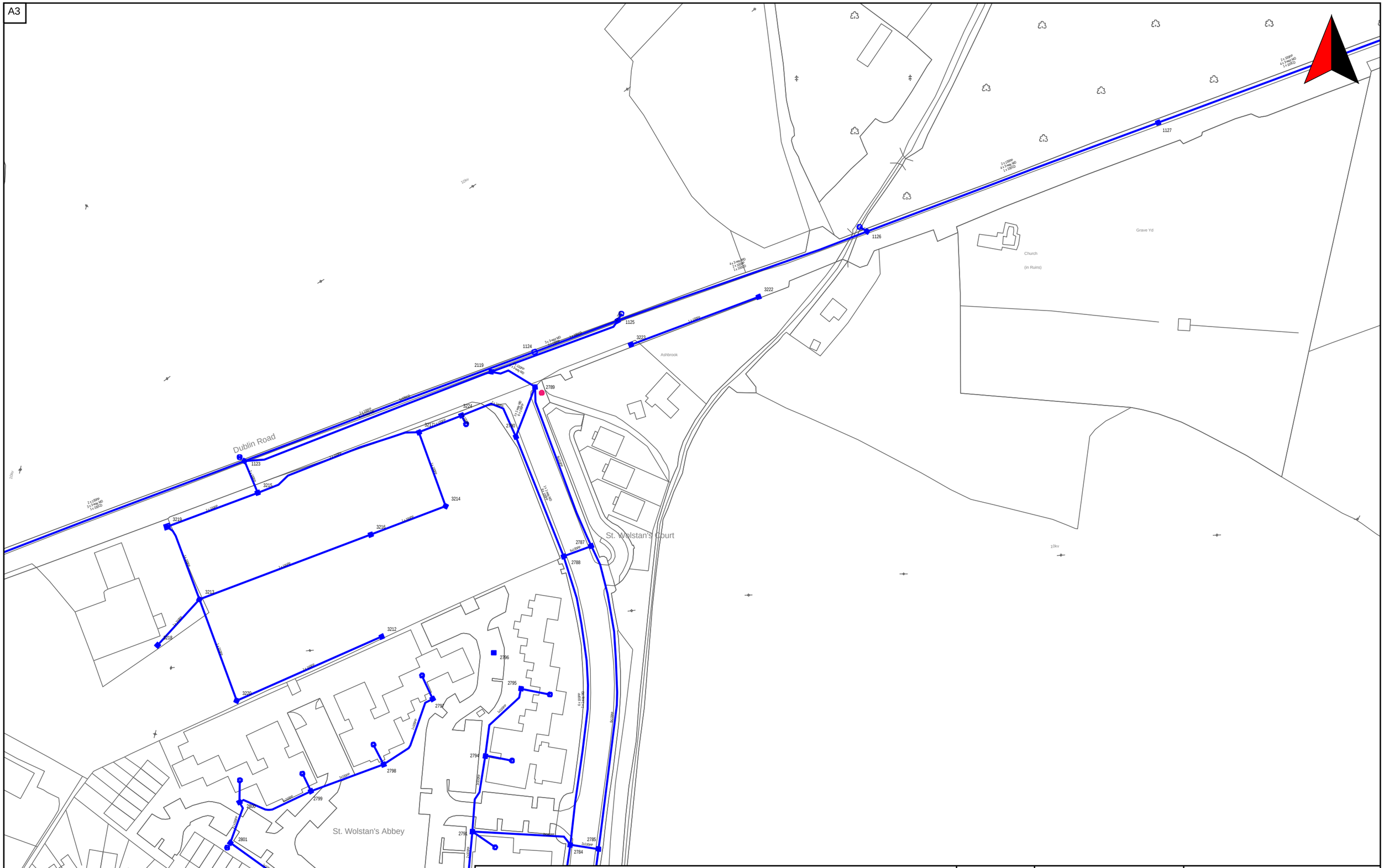

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https://cbyd.emaps.eircom.ie/

Scale: 1:1500	Irish National Grid Co-Ordinates Centre XY: 297958 m, 233050 m
Date 02/07/2020	emaps CBYD

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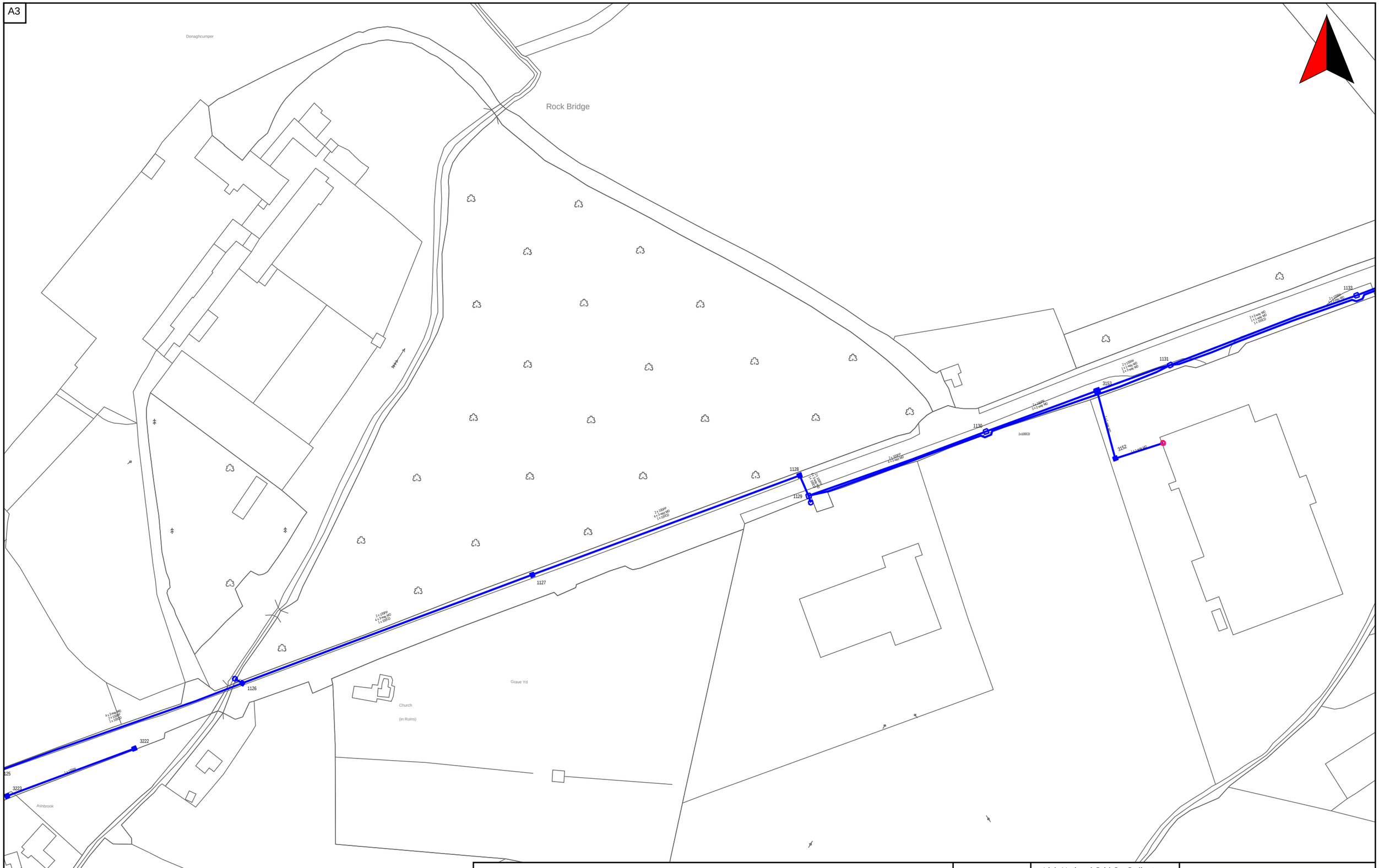
A3



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A3

Shinkeen

Bridge

Ballyoulster

Park

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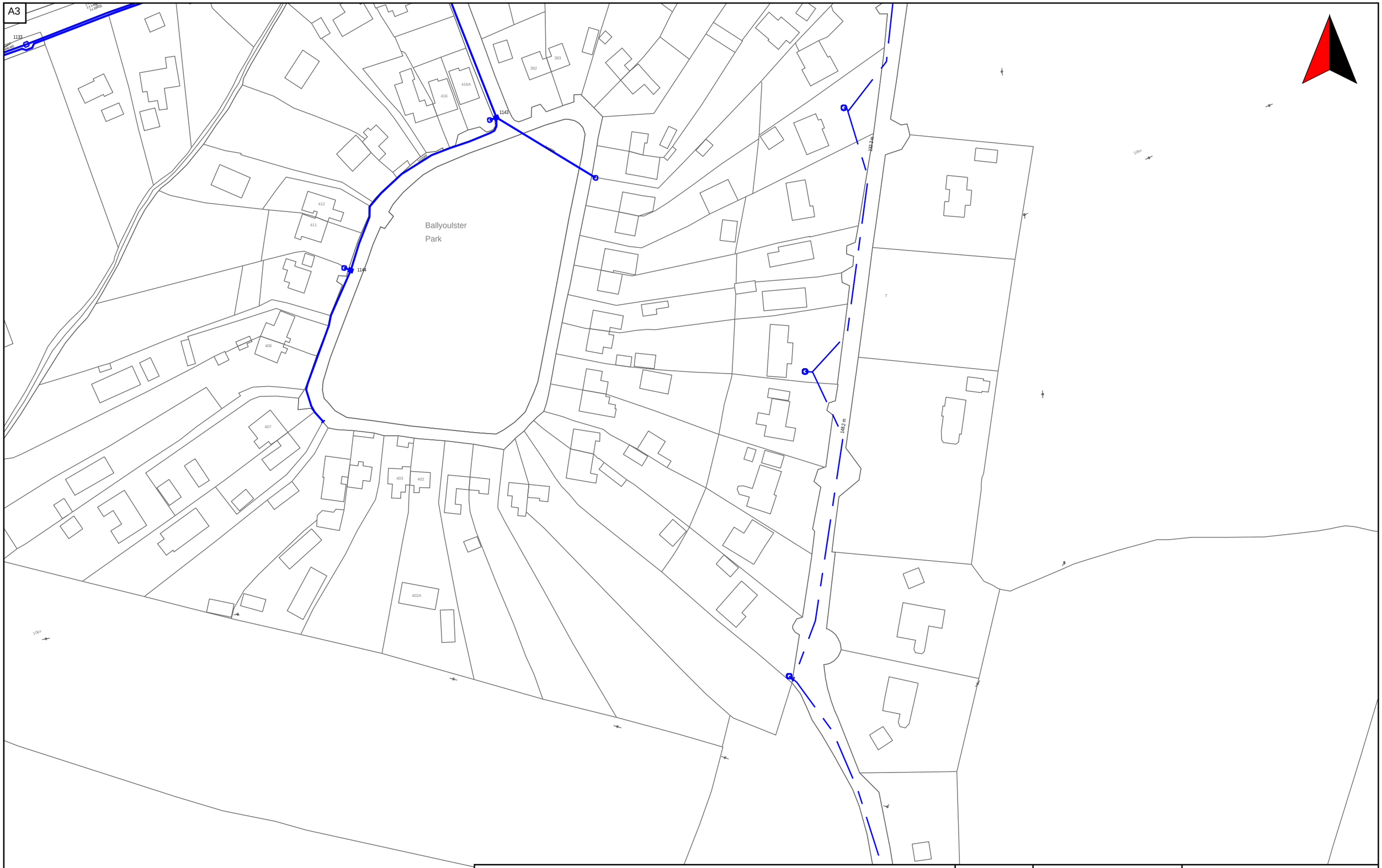

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Appendix B : Site Investigation Report

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Waste Characterisation Assessment

Lands at Ballyoulster

Celbridge

Co. Kildare

Prepared For: -

IGSL Limited
Unit F
M7 Business Park
Naas
County Kildare

Prepared By: -

O' Callaghan Moran & Associates
Unit 15 Melbourne Business Park
Model Farm Road
Cork

January 2022

Project	Waste Characterisation: Lands at Ballyoulster, Celbridge			
Client	IGSL Limited			
Report No	Date	Status	Prepared By	Reviewed By
220010301	18/01/2022	Final	Austin Hynes PGeo MSc	Sean Moran B.Sc. MSc

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1 INTRODUCTION

IGSL Limited requested O'Callaghan Moran & Associates (OCM) to undertake a waste characterisation assessment of samples of made ground collected from eighteen (18 No.) trial pits installed at a site near Ballyoulster, Celbridge, Co Kildare.

1.1 Methodology

IGSL provided a description of the ground conditions and collected samples of the soils from the window sample locations. The samples were analysed at an accredited laboratory and the results formed the basis for a waste classification assessment, which was undertaken by OCM in accordance with the Environmental Protection Agency (EPA) Guidelines on the Classification of Waste (2015).

2 WASTE CLASSIFICATION ASSESSMENT

2.1 Soil Sampling and Laboratory Analysis

2.1.1 *Site Investigation*

The site investigation was completed by IGSL Limited in November 2021 and included the collection of nineteen composite samples from eighteen (19 No.) window samples. The locations are shown on Figure 2.1. The logs are in Appendix 1.

There is topsoil at the surface of all locations. The logs indicate the subsurface is composed of Natural Ground composed of soft to firm sandy gravelly CLAY to between 0.50-1.00 mbgl. This is underlain by firm to stiff, sandy gravelly CLAY. The excavations were terminated due to refusal on weathered bedrock at depths between 1.10-1.50 mbgl.

At TP23, firm, sandy gravelly CLAY was encountered to 2.30 mbgl. This was underlain by firm, sandy CLAY.

2.1.2 *Sample Collection*

IGSL collected the samples and placed them in laboratory prepared containers that were stored in coolers prior to shipment to Chemtest Ltd.

2.1.3 *Laboratory Analysis*

The samples were tested for, metals (arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc, total organic carbon (TOC), BTEX (benzene, toluene, ethylbenzene and xylene) aliphatic and aromatic hydrocarbons, polychlorinated biphenyls (PCB), mineral oil, polyaromatic hydrocarbons (PAH) and asbestos. Leachate generated from the samples was tested for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc, chloride, fluoride, soluble sulphate, phenols, dissolved organic carbon (DOC), total dissolved solids (TDS).

This parameter range facilitates an assessment of the hazardous properties of the waste, and also allows a determination of appropriate off-site management options based on the Waste Acceptance Criteria (WAC) applied by landfill operators.

The analytical methods were all ISO/CEN approved and the method detection limits were below the relevant guidance/threshold values. The full laboratory report is in Appendix 2.

2.2 Waste Classification

The Haz Waste Online Classification Engine, developed in the UK by One Touch Data Ltd, was used to determine the waste classification. This tool was developed specifically to establish whether waste is non-hazardous or hazardous and has been approved for use in Ireland by the Environmental Protection Agency. The full Waste Classification Report is in Appendix 3 and the results are summarised in Table 2.1.

Table 2.1 Waste Classification

TP01	0.40	Non-Hazardous	17 05 04
TP02	0.30	Non-Hazardous	17 05 04
TP06	0.6	Non-Hazardous	17 05 04
TP07	0.50	Non-Hazardous	17 05 04
TP08	0.50	Non-Hazardous	17 05 04
TP10	0.80	Non-Hazardous	17 05 04
TP11	0.50	Non-Hazardous	17 05 04
TP12	0.50	Non-Hazardous	17 05 04
TP13	0.3	Non-Hazardous	17 05 04
TP14	0.30	Non-Hazardous	17 05 04
TP16	0.50	Non-Hazardous	17 05 04
TP17	0.50	Non-Hazardous	17 05 04
TP18	0.50	Non-Hazardous	17 05 04
TP20	0.50	Non-Hazardous	17 05 04
TP21	0.50	Non-Hazardous	17 05 04
TP22	0.50	Non-Hazardous	17 05 04
TP23	0.50	Non-Hazardous	17 05 04
TP23	1.5	Non-Hazardous	17 05 04
TP24	0.5	Non-Hazardous	17 05 04

Asbestos was not detected in any of the samples.

All samples are classified as non-hazardous and the appropriate List of Waste Code is 17 05 04 (Soil and Stone other than those mentioned in 17 05 03*).

ExpertGPS

23679 - Ballyoulster - Celbridge

50 0 50 100 150 200 250 300 350 400 450 500 550 600 m

Scale: 1 : 3500.

MN 2°09'

O'Callaghan Moran & Associates
environmental management for business
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Title:

Figure 2.1 Sample Location Plan

Legend

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Client:

IGSL Limited

2.3 Waste Acceptance Criteria

The results of the WAC testing are presented in Table 2.2-2.3, which includes for comparative purposes the WAC for Inert, Non Hazardous and Hazardous Waste Landfills pursuant to Article 16 of the EU Landfill Directive 1999/31/EC Annex II which establishes criteria and procedures for the acceptance of waste at landfills.

All samples meet the inert WAC.

Table 2.2 WAC Results

Parameter	Unit	TP01	TP02	TP06	TP07	TP08	TP10	TP11	TP12	TP13	TP14	Inert Landfill	Inert Landfill Increased Limits	Non-Hazardous Landfill	Hazardous Landfill
Depth	**m**	**0.40**	**0.30**	**0.6**	**0.50**	**0.50**	**0.80**	**0.50**	**0.50**	**0.3**	**0.30**				
Antimony	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.18	0.7	5
Arsenic	mg/kg	0.0043	0.0076	< 0.0002	0.0023	0.0056	< 0.0002	0.0067	0.0055	< 0.0002	0.029	0.5	1.5	2	25
Barium	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	20	20	100	300
Cadmium	mg/kg	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.0013	0.04	0.04	1	5
Chromium	mg/kg	0.0082	0.027	< 0.0005	< 0.0005	0.0060	< 0.0005	0.0068	0.0061	< 0.0005	0.027	0.5	0.5	10	70
Copper	mg/kg	0.015	0.027	0.0066	0.012	0.019	0.0065	0.025	0.019	0.0052	0.055	2	2	50	100
Lead	mg/kg	0.0055	0.0073	< 0.0005	< 0.0005	0.0065	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.022	0.5	0.5	10	50
Molybdenum	mg/kg	0.015	0.0038	< 0.0002	0.0095	0.014	0.010	0.022	0.025	< 0.0002	0.012	0.5	1.5	10	30
Nickel	mg/kg	0.013	0.032	< 0.0005	< 0.0005	0.015	0.0071	0.018	0.016	< 0.0005	0.068	0.4	0.4	10	40
Selenium	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0067	0.1	0.3	0.5	7
Zinc	mg/kg	0.061	0.099	< 0.003	< 0.003	< 0.003	< 0.003	0.051	0.032	< 0.003	0.16	4	4	50	200
Mercury	mg/kg	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.01	0.2	2
Phenol	mg/kg	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	1	1	NE	NE
Fluoride	mg/kg	2.0	1.8	1.0	2.0	5.8	2.6	6.6	7.9	< 1.0	4.1	10	10	150	500
Chloride	mg/kg	12	19	< 10	< 10	12	< 10	< 10	< 10	< 10	29	800	2,400	15,000	25,000
Sulphate	mg/kg	19	33	< 10	< 10	< 10	< 10	< 10	< 10	< 10	48	1000*	3,000	20000*	50,000
DOC **	mg/kg	1100	670	< 50	200	770	420	310	330	< 50	1100	500	500	800	1,000
pH	pH units	8.4	8.3	8.3	8.4	8.3	8.3	8.7	8.8	8.3	7.8	NE	NE	NE	NE
TDS ***	mg/kg	420	320	290	460	640	550	780	640	260	600	4,000	12,000	60,000	100,000
TOC	%	0.46	0.9	0.47	0.3	1.5	0.49	0.89	0.38	0.65	1.3	3	6	NE	6
Benzene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
Toluene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
Ethylbenzene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
m/p-Xylene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
o-Xylene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
PCB Total of 7	mg/kg	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	1	1	NE	NE
Total 17 PAH's	mg/kg	< 0.20	< 0.20	< 0.20	< 0.20	0.33	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	NE	100	NE	NE
Mineral Oil	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	500	500	NE	NE
Asbestos	% mass	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NE	NE	NE	NE

NAD denotes No Asbestos Detected

* denotes sulphate level exceeding inert waste limit may be considered as complying if the TDS value does not exceed 6,000mg/kg at L/S = 10l/kg.

** denotes a higher limit may be accepted provided the DOC alternative values of 500mg/kg is achieved

*** denotes TDS. The values for TDS can be used to sulphate and chloride.

PAH over 1mg/kg and Mineral Oil over 50 mg/kg exceeds limit at soil recovery site in Ireland

Table 2.3 WAC Results

Parameter	Unit	TP16	TP17	TP18	TP20	TP21	TP22	TP23	TP23	TP24	Inert Landfill	Inert Landfill Increased Limits	Non-Hazardous Landfill	Hazardous Landfill
Depth	**m**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**1.5**	**0.5**				
Antimony	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.18	0.7	5
Arsenic	mg/kg	0.0026	0.0051	0.0028	0.0020	0.0034	< 0.0002	0.0023	0.0027	< 0.0002	0.5	1.5	2	25
Barium	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	20	20	100	300
Cadmium	mg/kg	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	0.04	1	5
Chromium	mg/kg	< 0.0005	0.0088	0.0087	0.0052	0.0057	0.0075	< 0.0005	< 0.0005	< 0.0005	0.5	0.5	10	70
Copper	mg/kg	0.013	0.019	0.011	0.0069	0.018	0.014	< 0.0005	< 0.0005	0.0055	2	2	50	100
Lead	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	0.5	10	50
Molybdenum	mg/kg	0.013	0.0051	0.020	0.017	0.052	0.021	0.021	0.0040	0.0028	0.5	1.5	10	30
Nickel	mg/kg	0.0091	0.024	< 0.0005	< 0.0005	0.018	0.0054	< 0.0005	< 0.0005	< 0.0005	0.4	0.4	10	40
Selenium	mg/kg	< 0.0005	0.0084	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.3	0.5	7
Zinc	mg/kg	< 0.003	0.033	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	4	4	50	200
Mercury	mg/kg	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.01	0.2	2
Phenol	mg/kg	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	1	1	NE	NE
Fluoride	mg/kg	6.2	4.7	5.0	5.5	9.6	5.5	3.4	< 1.0	< 1.0	10	10	150	500
Chloride	mg/kg	< 10	< 10	< 10	17	< 10	22	20	< 10	< 10	800	2,400	15,000	25,000
Sulphate	mg/kg	< 10	13	< 10	15	< 10	40	15	< 10	< 10	1000*	3,000	20000*	50,000
DOC **	mg/kg	420	900	200	290	720	200	350	< 50	< 50	500	500	800	1,000
pH	pH units	8.3	8.1	8.2	8.3	8.5	8.1	8.5	8.2	8.3	NE	NE	NE	NE
TDS ***	mg/kg	600	500	710	710	710	1000	650	190	290	4,000	12,000	60,000	100,000
TOC	%	0.7	0.97	0.79	0.3	0.71	1.1	0.44	0.6	0.24	3	6	NE	6
Benzene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
Toluene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
Ethylbenzene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
m/p-Xylene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
o-Xylene	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	6	6	NE	NE
PCB Total of 7	mg/kg	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	1	1	NE	NE
Total 17 PAH's	mg/kg	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	65	NE	100	NE	NE
Mineral Oil	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	500	500	NE	NE
Asbestos	% mass	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NE	NE	NE	NE

NAD denotes No Asbestos Detected

* denotes sulphate level exceeding inert waste limit may be considered as complying if the TDS value does not exceed 6,000mg/kg at L/S = 10l/kg.

** denotes a higher limit may be accepted provided the DOC alternative values of 500mg/kg is achieved

*** denotes TDS. The values for TDS can be used to sulphate and chloride.

PAH over 1mg/kg and Mineral Oil over 50 mg/kg exceeds limit at soil recovery site in Ireland

2.4 Waste Management Options

The EPA has issued guidance on acceptance criteria for a range of parameters for soil recovery sites. This includes;

- Metals (solid concentration not leachability) in soil and stone (including As, Cd, Cr, Cu, Hg, Ni, Pb, Zn);
- Total organic carbon in soil and stone;
- Total BTEX (benzene, toluene, ethylbenzene, xylenes) in soil and stone;
- Mineral oil in soil and stone;
- Polycyclic aromatic hydrocarbons (PAHs) in soil and stone;
- Polychlorinated Biphenyls (PCBs) in soil and stone;
- Asbestos fibres in soil and stone.

The guidance requires that soils from brownfield sites should not exceed the limits for the parameters specified in Table 2.4 and 2.5. For metals limits have been specified for a range of soil types nationally separated into six domain areas.

Table 2.4 Soil Recovery Site Criteria

Parameter	Limit for Soil Recovery Sites
Total BTEX	0.05 mg/kg
Mineral oil	50 mg/kg
Total PAHs	1 mg/kg
Total PCBs	0.05 mg/kg

The sample from TP24 (0.50m) exceeds the soil recovery criteria for Mineral Oil. This sample has therefore been classified as (B-1) suitable for inert landfill.

The soil and stone cannot be sent to soil recovery sites if the trigger levels for a particular domain are exceeded. There is however some flexibility in applying the limits. A derogation applies where up to three parameters can exceed the limit for a sample provided the concentration in the samples is no more than 1.5 times the trigger level. The site which is subject to this investigation is located in Domain 2 and the trigger levels are listed in Table 2.5.

Table 2.5 Soil Recovery Trigger Levels

		Domain 2 Trigger Level	1.5 times Trigger Level
Arsenic	**mg/kg**	24.90	37.35
Cadmium	**mg/kg**	3.28	4.92
Chromium	**mg/kg**	50.30	75.45
Copper	**mg/kg**	63.50	95.25
Mercury	**mg/kg**	0.36	0.54
Nickel	**mg/kg**	61.90	92.85
Lead	**mg/kg**	86.10	129.15
Zinc	**mg/kg**	197.00	295.5

The samples from TP12 (0.50m) and TP22 (0.50m) exceed the soil recovery criteria for metal concentrations. Both samples exceed the 1.5 times trigger level for Nickel. These samples have therefore been classified as (B-1) suitable for inert landfill.

Waste management options are summarised on Table 2.6. All are subject to approval of the waste management facility operators. Class A material is suitable for removal to a soil recovery facility. Class B-1 wastes are suitable for recovery/disposal to inert waste landfill. Class C wastes are suitable for disposal to non-hazardous landfill.

Table 2.6 Waste Management Options

Sample No.	Depth	Classification	LoW Code	Category
TP01	0.40	Non-Hazardous	17 05 04	C
TP02	0.30	Non-Hazardous	17 05 04	C
TP06	0.6	Non-Hazardous	17 05 04	A
TP07	0.50	Non-Hazardous	17 05 04	A
TP08	0.50	Non-Hazardous	17 05 04	C
TP10	0.80	Non-Hazardous	17 05 04	A
TP11	0.50	Non-Hazardous	17 05 04	A
TP12	0.50	Non-Hazardous	17 05 04	B-1
TP13	0.3	Non-Hazardous	17 05 04	A
TP14	0.30	Non-Hazardous	17 05 04	C
TP16	0.50	Non-Hazardous	17 05 04	A
TP17	0.50	Non-Hazardous	17 05 04	C
TP18	0.50	Non-Hazardous	17 05 04	A
TP20	0.50	Non-Hazardous	17 05 04	A
TP21	0.50	Non-Hazardous	17 05 04	C
TP22	0.50	Non-Hazardous	17 05 04	B-1
TP23	0.50	Non-Hazardous	17 05 04	A
TP23	1.5	Non-Hazardous	17 05 04	A
TP24	0.5	Non-Hazardous	17 05 04	B-1

A	Meets Soil Recovery Criteria, 17 05 04
B-1	Non-Hazardous, Meets Inert WAC 17 05 04
C	Non Hazardous, Exceeds Inert WAC increased limits 17 05 04

3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 *Waste Classification*

Asbestos was not detected in any of the samples.

All samples are classified as non-hazardous and the appropriate List of Waste Code is 17 05 04 (Soil and Stone other than those mentioned in 17 05 03*).

The recovery/disposal options are discussed in Section 2.4.

3.2 Recommendations

OCM recommend that a copy of this report be provided in full to the relevant waste management facilities to which the made ground and subsoils will be consigned to confirm its suitability for acceptance.

Appendix 1

Trial Pit Logs

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP01**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Soft to firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.					AA150903	B	0.40-1.00		
1.0 Firm brownish grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are sub angular to angular and fine to coarse. Refusal at 1.5 m on angular limestone weathered rockhead.		1.00			AA150904	B	1.00-1.50		
End of Trial Pit at 1.50m		1.50							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP02**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Soft brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		0.80			AA150901	B	0.30-0.80		
Firm greyish brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		1.50							
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels and cobbles are angular to sub rounded and fine to coarse. Refusal at 1.8 m on angular limestone weathered rockhead.		1.80			AA150902	B	1.50-1.80		
End of Trial Pit at 1.80m									

1.0 2.0 3.0 4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP03**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.90			AA150905	B	0.30-0.90		
1.0 Firm greyish brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular limestone weathered rockhead.		1.40			AA150906	B	0.90-1.40		
End of Trial Pit at 1.40m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP04**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Soft to firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA160296	B	0.50		
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.		1.20							
Weathered rockhead recovered as tabular angular cobble and boulder sized blocks of grey limestone. Refusal at 1.5 m.		1.50							
End of Trial Pit at 1.50m									

1.0 2.0 3.0 4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP05**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm greyish brown slightly sandy CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are sub angular to sub rounded and fine to coarse.					AA150911	B	0.30-0.90		
		0.90							
1.0 Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels and cobbles are angular to sub rounded and fine to coarse. Refusal at 1.2 m on angular limestone weathered rockhead.					AA150912	B	0.90-1.20		
		1.20							
End of Trial Pit at 1.20m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP06**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.60			AA150909	B	0.60-0.90		
Firm greyish brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular limestone weathered rockhead.		0.90			AA150910	B	0.90-1.20		
1.0 Firm to stiff grey slightly sandy gravelly CLAY with low cobble and low boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal at 1.2 m on angular limestone weathered rockhead.		1.20							
End of Trial Pit at 1.20m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP07**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Soft to firm brown sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA160297	B	0.50		
Firm to stiff brownish grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.		1.30			AA160298	B	1.20		
Weathered rockhead recovered as tabular angular cobble and boulder sized blocks of grey limestone. Refusal at 1.5 m.		1.50							
End of Trial Pit at 1.50m									

1.0 2.0 3.0 4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP08**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse. Refusal at 1.6 m on angular tabular limestone weathered rockhead.					AA18359	B	0.50		
					AA18360	B	1.50		
End of Trial Pit at 1.60m		1.60							

1.0
2.0
3.0
4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP09**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.					AA160299	B	0.70		
1.0 Weathered rockhead recovered as tabular angular cobble sized blocks of grey limestone. Refusal at 1.5 m.		1.10 1.20							
End of Trial Pit at 1.60m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP10**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular and fine to coarse.		0.80			AA150907	B	0.80-1.30		
1.0 Firm greyish brown slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub rounded and fine to coarse.		1.30			AA150908	B	1.30-1.70		
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble and medium boulder content. Refusal at 1.7 m on angular limestone weathered rockhead.		1.70							
End of Trial Pit at 1.70m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP11**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	29/10/2021
		DATE COMPLETED	29/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm brown sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.60			AA156966	B	0.50		
Firm to stiff light brown slightly sandy very gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		1.20							
1.0 Very weathered rockhead recovered as angular platey gravels with some clay. Refusal at 1.4 m.		1.40							
End of Trial Pit at 1.40m					AA156967	B	1.40		
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP12**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm to stiff brown mottled grey slightly gravelly sandy silty CLAY. Gravels are sub angular to sub rounded and fine to medium.					AA18365	B	0.50		
1.0									
Firm to stiff brown mottled grey sandy silty very gravelly CLAY. Gravels and cobbles are sub angular to sub rounded and fine to coarse. Refusal 1.4 m on angular tabular limestone weathered rockhead.		1.20							
End of Trial Pit at 1.40m		1.40			AA18366	B	1.40		
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP13**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse.		0.80			AA150913	B	0.30-0.80		
Firm to stiff grey slightly sandy gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are sub angular to to angular and fine to coarse. Refusal at 1.1 m on angular limestone weathered rockhead.		1.10			AA150914	B	0.80-1.10		
End of Trial Pit at 1.10m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP14**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Soft brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		0.30			AA150915	B	0.30-0.80		
Soft to firm brownish grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse.		0.80			AA150916	B	0.80-1.00		
1.0 Firm grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub rounded platey and fine to coarse. Refusal at 1.3 m on angular limestone weathered rockhead.		1.00							
End of Trial Pit at 1.30m		1.30							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP15**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.50							
Very weathered rockhead recovered as angular platey cobbles and boulders of grey limestone with clay. Tough digging. Refusal at 0.8 m.		0.80			AA156977	B	0.60		
1.0 End of Trial Pit at 0.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP16**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
					Sample Ref	Type	Depth		
0.0					AA156960	B	0.50		
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP17**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy slightly gravelly CLAY. Gravels are sub angular to sub rounded.		0.60			AA156973	B	0.50		
Firm grey slightly sandy very gravelly CLAY with high cobble content and medium boulder content. Very weathered angular platey limestone rockhead from 1 m within the clay refusal at 1.8 m.					AA156974	B	1.10		
1.0									
End of Trial Pit at 1.80m		1.80							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP18**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm to stiff brown slightly sandy CLAY.		0.60			AA18361	B	0.50		
Firm to stiff greyish brown slightly sandy very gravelly CLAY with high cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.2 m on angular tabular limestone weathered rockhead.									
1.0					AA18362	B	1.10		
End of Trial Pit at 1.20m		1.20							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP19**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60							
Firm to stiff brownish grey sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular platey weathered rockhead of grey limestone.					AA156957	B	0.60		
1.0					AA156959	B	1.20		
End of Trial Pit at 1.40m		1.40							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP20**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	01/11/2021
		DATE COMPLETED	01/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL		0.25							
	Firm to stiff greyish brown slightly sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse.		0.70			AA156970	B	0.50		
1.0	Stiff brownish grey sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse. Refusal at 1.4 on weathered rockhead.		1.40			AA156971	B	1.30		
	End of Trial Pit at 1.40m									
2.0										
3.0										
4.0										

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP21**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm to stiff brownish grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular platey weathered rockhead of grey limestone.		0.30			AA156964	B	0.50		
Firm grey sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.60 0.70			AA18363	B	0.50		
1.0 Stiff greyish brown sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal at 1.8 m on angular platey weathered rockhead of grey limestone.		1.10							
Rockhead recovered as angular tabular cobble and boulder sized grey limestone blocks. Refusal at 1.1m.					AA156965	B	1.50		
		1.80			AA18364	B	1.50		
End of Trial Pit at 1.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP22**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY.Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA156972	B	0.50		
Very weathered rock head recovered as angular platey cobbles and boulders of blackish grey limestone.		0.80							
End of Trial Pit at 0.80m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP23**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm to stiff brown sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		1.00			AA156961	B	0.50		
1.0 Firm grey mottled brown and black sandy silty gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are sub angular to sub rounded and fine to coarse.		1.60			AA156962	B	1.50		
Firm grey mottled brown and black sandy silty gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		2.30							
2.0 Firm black mottled grey and brown sandy silty CLAY.		3.00			AA156963	B	2.80		
3.0 End of Trial Pit at 3.00m									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP24**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.50							
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.					AA160294	B	0.50		
1.0									
Very weathered rockhead recovered as angular platey gravels with some clay. Refusal at 1.5 m due to this rock.		1.30							
End of Trial Pit at 1.50m		1.50			AA160295	B	1.50		
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP25**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.60							
Stiff brown slightly sandy very gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal on large boulders/ possible weathered limestone rockhead.									
1.0									
End of Trial Pit at 1.80m		1.80							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP26**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy slightly gravelly CLAY. Gravels are sub angular to sub rounded.		0.60			AA156975	B	0.50		
Stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Gravels and cobbles ae sub angular to sub rounded and fine to coarse.					AA156976	B	1.70		
2.0 End of Trial Pit at 2.20m		2.20							
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679A.GPJ IGSL.GDT 11/12/21

Appendix 2

Laboratory Report

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

2183

Amended Report

Report No.:	21-43195-2		
Initial Date of Issue:	16-Dec-2021	**Date of Re-Issue:**	04-Jan-2022
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballyouster Cellbridge Kildare (DBFL)		
Quotation No.:	Q20-19951	**Date Received:**	07-Dec-2021
Order No.:		**Date Instructed:**	07-Dec-2021
No. of Samples:	15		
Turnaround (Wkdays):	7	**Results Due:**	15-Dec-2021
Date Approved:	16-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-43368-1		
Initial Date of Issue:	16-Dec-2021		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballyouster Cellbridge Kildare (DBFL)		
Quotation No.:	Q20-21693	**Date Received:**	08-Dec-2021
Order No.:		**Date Instructed:**	08-Dec-2021
No. of Samples:	8		
Turnaround (Wkdays):	7	**Results Due:**	16-Dec-2021
Date Approved:	16-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-43968-1		
Initial Date of Issue:	24-Dec-2021		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballypuster Celbridge Kildare (DBFL)		
Quotation No.:	Q20-21693	**Date Received:**	14-Dec-2021
Order No.:		**Date Instructed:**	14-Dec-2021
No. of Samples:	12		
Turnaround (Wkdays):	7	**Results Due:**	22-Dec-2021
Date Approved:	24-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951				**Chemtest Sample ID.:**	1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:				Client Sample Ref.:	AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
				Sample Location:	TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
				Asbestos Lab:	DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-		-		-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	29	35	26	30	20	20	22	18	23
pH (2.5:1)	N	2010		4.0			[A] 7.8		[A] 8.4				
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] 0.49	[A] 0.42		[A] 1.6		[A] < 0.40	[A] 0.48	[A] < 0.40	[A] 0.41
Magnesium (Water Soluble)	N	2120	g/l	0.010			[A] < 0.010		[A] < 0.010				
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			[A] < 0.010		[A] < 0.010				
Total Sulphur	U	2175	%	0.010			[A] 0.028		[A] 0.030				
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Chloride (Water Soluble)	U	2220	g/l	0.010			[A] 0.013		[A] < 0.010				
Nitrate (Water Soluble)	N	2220	g/l	0.010			0.033		< 0.010				
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50		[A] < 0.50		[A] 2.8	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 3.6	[A] 6.6		[A] 3.3		[A] 2.8	[A] 4.4	[A] 6.2	[A] 1.8
Ammonium (Water Soluble)	U	2220	g/l	0.01			< 0.01		< 0.01				
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] < 0.010	[A] 0.022	[A] 0.033	[A] 0.064	[A] 0.027	[A] 0.019	[A] 0.016	[A] 0.033	[A] 0.026
Arsenic	U	2450	mg/kg	1.0	6.8	12		9.4		15	13	16	12
Barium	U	2450	mg/kg	10	50	59		78		72	110	65	69
Cadmium	U	2450	mg/kg	0.10	0.91	2.1		1.5		2.6	2.2	2.0	1.5
Chromium	U	2450	mg/kg	1.0	14	22		20		26	26	21	22
Molybdenum	U	2450	mg/kg	2.0	2.0	3.1		< 2.0		2.7	2.7	3.3	3.4
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0		< 2.0		< 2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	15	34		22		37	31	40	37
Mercury	U	2450	mg/kg	0.10	< 0.10	0.13		0.12		0.10	0.11	0.11	< 0.10
Nickel	U	2450	mg/kg	0.50	24	69		39		77	58	77	63
Lead	U	2450	mg/kg	0.50	16	21		26		28	33	30	29
Selenium	U	2450	mg/kg	0.20	0.29	1.2		0.66		0.39	0.56	0.76	1.1
Zinc	U	2450	mg/kg	0.50	89	120		87		120	120	110	120
Chromium (Trivalent)	N	2490	mg/kg	1.0	14	22		20		26	26	21	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10		< 10		< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL		**Chemtest Job No.:**			21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951		**Chemtest Sample ID.:**			1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:		Client Sample Ref.:			AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
		Sample Location:			TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
		Asbestos Lab:			DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10	[A] < 10		[A] < 10		[A] < 10	[AC] < 10	[A] < 10	[A] < 10
Benzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Naphthalene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluorene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Phenanthrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.025		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[a]anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.026		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Chrysene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.028		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[a]pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.054		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.039		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.022		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.038		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Coronene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	[A] < 0.20	[A] < 0.20		[A] 0.33		[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20
PCB 28	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:			Client Sample Ref.:		AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
			Sample Location:		TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
			Asbestos Lab:		DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 52	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10		< 0.10		< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951				**Chemtest Sample ID.:**	1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:				Client Sample Ref.:	AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
				Sample Location:	TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
				Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A		-		-	-	-	-	-	-
Asbestos Identification	U	2192		N/A		No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	21	21	24	12	12	12	10	17	12
pH (2.5:1)	N	2010		4.0	[A] 8.4		[A] 8.1						
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		[A] < 0.40		[A] < 0.40	[A] < 0.40	[A] < 0.40	[A] < 0.40	[A] 0.64	[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010	[A] < 0.010		[A] < 0.010						
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.039		[A] 0.16						
Total Sulphur	U	2175	%	0.010	[A] 0.046		[A] 0.048						
Sulphur (Elemental)	U	2180	mg/kg	1.0		[A] 1.1		[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Chloride (Water Soluble)	U	2220	g/l	0.010	[A] < 0.010		[A] < 0.010						
Nitrate (Water Soluble)	N	2220	g/l	0.010	0.011		< 0.010						
Cyanide (Total)	U	2300	mg/kg	0.50		[A] < 0.50		[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		[A] 15		[A] 8.1	[A] 26	[A] 33	[A] 16	[A] 7.5	[A] 7.3
Ammonium (Water Soluble)	U	2220	g/l	0.01	< 0.01		< 0.01						
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.024	[A] 0.052	[A] 0.11	[A] 0.079	[A] 0.031	[A] 0.035	[A] < 0.010	[A] 0.032	[A] < 0.010
Arsenic	U	2450	mg/kg	1.0		13		34	13	16	17	19	22
Barium	U	2450	mg/kg	10		51		160	87	53	350	73	83
Cadmium	U	2450	mg/kg	0.10		2.2		2.8	0.97	1.4	2.1	2.4	3.5
Chromium	U	2450	mg/kg	1.0		22		22	11	16	23	23	30
Molybdenum	U	2450	mg/kg	2.0		2.1		2.9	< 2.0	3.0	3.2	< 2.0	3.6
Antimony	N	2450	mg/kg	2.0		< 2.0		2.0	< 2.0	< 2.0	< 2.0	2.0	2.5
Copper	U	2450	mg/kg	0.50		27		27	24	26	29	32	42
Mercury	U	2450	mg/kg	0.10		< 0.10		0.11	< 0.10	< 0.10	< 0.10	< 0.10	0.14
Nickel	U	2450	mg/kg	0.50		58		69	48	59	78	60	93
Lead	U	2450	mg/kg	0.50		31		52	21	23	24	29	52
Selenium	U	2450	mg/kg	0.20		0.45		0.30	< 0.20	0.48	< 0.20	< 0.20	0.65
Zinc	U	2450	mg/kg	0.50		150		190	58	88	89	110	230
Chromium (Trivalent)	N	2490	mg/kg	1.0		22		22	11	16	23	23	30
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10		< 10		< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL					**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951					**Chemtest Sample ID.:**	1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:					Client Sample Ref.:	AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
					Sample Location:	TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
					Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		[A] < 10		[A] < 10	[AC] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	
Benzene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Toluene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Ethylbenzene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
m & p-Xylene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
o-Xylene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Naphthalene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Acenaphthylene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Acenaphthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Fluorene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Phenanthrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[a]anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Chrysene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[b]fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[k]fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[a]pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Coronene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Total Of 17 PAH's	N	2800	mg/kg	0.20		[A] < 0.20		[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	
PCB 28	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:			Client Sample Ref.:		AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
			Sample Location:		TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
			Asbestos Lab:			DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 52	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10		< 0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1336017	1339081	1339082	1339085	1339089	1339090
Order No.:			Client Sample Ref.:		AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
			Sample Location:		TP22	TP06	TP06	TP13	TP23	TP24
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.6	0.9	0.3	1.5	0.5
			Asbestos Lab:		DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-		-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	17	17	17	15	32	17
pH (2.5:1)	N	2010		4.0			[A] 8.5			
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] 0.48	[A] < 0.40		[A] < 0.40	[A] < 0.40	[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010			[A] < 0.010			
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			[A] < 0.010			
Total Sulphur	U	2175	%	0.010			[A] 0.029			
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] 1.1	[A] < 1.0	[A] 14
Chloride (Water Soluble)	U	2220	g/l	0.010			[A] < 0.010			
Nitrate (Water Soluble)	N	2220	g/l	0.010			0.012			
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50		[A] 6.1	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 6.2	[A] 49		[A] 19	[A] 9.8	[A] 2.4
Ammonium (Water Soluble)	U	2220	g/l	0.01			< 0.01			
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.037	[A] 0.021	[A] 0.024	[A] 0.030	[A] < 0.010	[A] 0.024
Arsenic	U	2450	mg/kg	1.0	21	3.7		4.9	5.1	3.8
Barium	U	2450	mg/kg	10	83	25		36	20	15
Cadmium	U	2450	mg/kg	0.10	3.0	0.48		0.69	< 0.10	0.45
Chromium	U	2450	mg/kg	1.0	29	8.1		10	8.3	5.2
Molybdenum	U	2450	mg/kg	2.0	4.1	< 2.0		< 2.0	< 2.0	< 2.0
Antimony	N	2450	mg/kg	2.0	2.7	< 2.0		< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	41	15		12	5.8	9.5
Mercury	U	2450	mg/kg	0.10	0.15	< 0.10		< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	100	27		23	11	23
Lead	U	2450	mg/kg	0.50	53	10		12	16	4.7
Selenium	U	2450	mg/kg	0.20	1.4	< 0.20		< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	190	32		47	8.6	21
Chromium (Trivalent)	N	2490	mg/kg	1.0	29	8.1		10	8.3	5.2
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10		< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1336017	1339081	1339082	1339085	1339089	1339090
Order No.:			Client Sample Ref.:		AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
			Sample Location:		TP22	TP06	TP06	TP13	TP23	TP24
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.6	0.9	0.3	1.5	0.5
			Asbestos Lab:		DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0	[A] < 5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0	[A] < 5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10	[A] < 10		[A] < 10	[A] < 10	[A] < 10
Benzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Naphthalene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluorene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Phenanthrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.9
Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 2.5
Fluoranthene	N	2800	mg/kg	0.010	[A] 0.036	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 11
Pyrene	N	2800	mg/kg	0.010	[A] 0.020	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 8.6
Benzo[a]anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 6.5
Chrysene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.9
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 8.7
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.0
Benzo[a]pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.3
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.7
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 1.3
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.1
Coronene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	[A] < 0.20	[A] < 0.20		[A] < 0.20	[A] < 0.20	[A] 65
PCB 28	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1336017	1339081	1339082	1339085	1339089	1339090
Order No.:			Client Sample Ref.:		AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
			Sample Location:		TP22	TP06	TP06	TP13	TP23	TP24
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.6	0.9	0.3	1.5	0.5
			Asbestos Lab:		DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
PCB 52	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10

Results - Leachate

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**		21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951				**Chemtest Sample ID.:**		1335207	1335208	1335210	1335212	1335213	1335214	1335215	1335217	1335219	1335220	1335221
Order No.:				Client Sample Ref.:		AA150903	AA150901	AA18359	AA150907	AA150915	AA156960	AA156973	AA18361	AA156970	AA18363	AA156961
				Sample Location:		TP01	TP02	TP08	TP10	TP14	TP16	TP17	TP18	TP20	TP21	TP23
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.40	0.30	0.50	0.80	0.30	0.50	0.50	0.50	0.50	0.50	0.50
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**											
pH	U	1010	10:1		N/A	8.5	8.3	8.4	8.6	8.3	8.6	8.6	8.5	8.6	8.7	8.7
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	0.16	0.067	< 0.050	< 0.050	0.056	< 0.050	0.067	0.065	< 0.050	0.057
Ammonium	N	1220	10:1	mg/kg	0.10	0.44	1.8	0.77	0.43	0.52	0.69	0.29	0.80	0.80	0.58	0.72
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[j]fluoranthene	N	1800	10:1	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Results - Leachate

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**		21-43368	21-43368	21-43368	21-43368	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951				**Chemtest Sample ID.:**		1336011	1336013	1336014	1336017	1339081	1339085	1339089	1339090
Order No.:				Client Sample Ref.:		AA160297	AA156966	AA18365	AA156972	AA150909	AA150913	AA156962	AA160295
				Sample Location:		TP07	TP11	TP12	TP22	TP06	TP13	TP23	TP24
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.50	0.50	0.50	0.6	0.3	1.5	0.5
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**								
pH	U	1010	10:1		N/A	8.3	8.5	8.6	8.4	8.6	8.7	8.7	8.9
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	0.11	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.078
Ammonium	N	1220	10:1	mg/kg	0.10	0.52	1.3	0.42	0.56	0.47	0.36	0.32	1.1
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01	< 0.01	0.55	0.19	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[j]fluoranthene	N	1800	10:1	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010				

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335207						
Sample Ref:	AA150903						
Sample ID:							
Sample Location:	TP01						
Top Depth(m):	0.40						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.46	3	5	6
Loss On Ignition	2610	U	%	2.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0040	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0004	0.0043	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0008	0.0082	0.5	10	70
Copper	1455	U	0.0015	0.015	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0015	0.015	0.5	10	30
Nickel	1455	U	0.0013	0.013	0.4	10	40
Lead	1455	U	0.0006	0.0055	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.006	0.061	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.20	2.0	10	150	500
Sulphate	1220	U	1.9	19	1000	20000	50000
Total Dissolved Solids	1020	N	43	420	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	110	1100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	29

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335208						
Sample Ref:	AA150901						
Sample ID:							
Sample Location:	TP02						
Top Depth(m):	0.30						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.90	3	5	6
Loss On Ignition	2610	U	%	13	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0060	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0008	0.0076	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0027	0.027	0.5	10	70
Copper	1455	U	0.0027	0.027	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0038	0.5	10	30
Nickel	1455	U	0.0032	0.032	0.4	10	40
Lead	1455	U	0.0007	0.0073	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.010	0.099	4	50	200
Chloride	1220	U	1.9	19	800	15000	25000
Fluoride	1220	U	0.18	1.8	10	150	500
Sulphate	1220	U	3.3	33	1000	20000	50000
Total Dissolved Solids	1020	N	33	320	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	67	670	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	35

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335210						
Sample Ref:	AA18359						
Sample ID:							
Sample Location:	TP08						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.5	3	5	6
Loss On Ignition	2610	U	%	7.4	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] 0.33	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0056	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0060	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0014	0.014	0.5	10	30
Nickel	1455	U	0.0015	0.015	0.4	10	40
Lead	1455	U	0.0007	0.0065	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.58	5.8	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	65	640	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	77	770	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	30

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335212						
Sample Ref:	AA150907						
Sample ID:							
Sample Location:	TP10						
Top Depth(m):	0.80						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.49	3	5	6
Loss On Ignition	2610	U	%	3.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0065	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0010	0.010	0.5	10	30
Nickel	1455	U	0.0007	0.0071	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	55	550	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	42	420	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	20

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335213						
Sample Ref:	AA150915						
Sample ID:							
Sample Location:	TP14						
Top Depth(m):	0.30						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.3	3	5	6
Loss On Ignition	2610	U	%	4.6	--	--	10
Total BTEX	2760	U	mg/kg	[AC] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[AC] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[AC] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0028	0.029	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	0.00013	0.0013	0.04	1	5
Chromium	1455	U	0.0027	0.027	0.5	10	70
Copper	1455	U	0.0055	0.055	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0012	0.012	0.5	10	30
Nickel	1455	U	0.0068	0.068	0.4	10	40
Lead	1455	U	0.0022	0.022	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0007	0.0067	0.1	0.5	7
Zinc	1455	U	0.016	0.16	4	50	200
Chloride	1220	U	2.9	29	800	15000	25000
Fluoride	1220	U	0.41	4.1	10	150	500
Sulphate	1220	U	4.8	48	1000	20000	50000
Total Dissolved Solids	1020	N	61	600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	110	1100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	22

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335214						
Sample Ref:	AA156960						
Sample ID:							
Sample Location:	TP16						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.70	3	5	6
Loss On Ignition	2610	U	%	2.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0026	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0013	0.013	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0013	0.013	0.5	10	30
Nickel	1455	U	0.0009	0.0091	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.62	6.2	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	60	600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	42	420	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	18

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335215						
Sample Ref:	AA156973						
Sample ID:							
Sample Location:	TP17						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.97	3	5	6
Loss On Ignition	2610	U	%	1.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0051	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0009	0.0088	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0005	0.0051	0.5	10	30
Nickel	1455	U	0.0024	0.024	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0008	0.0084	0.1	0.5	7
Zinc	1455	U	0.003	0.033	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.47	4.7	10	150	500
Sulphate	1220	U	1.3	13	1000	20000	50000
Total Dissolved Solids	1020	N	50	500	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	90	900	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	23

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335217						
Sample Ref:	AA18361						
Sample ID:							
Sample Location:	TP18						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.79	3	5	6
Loss On Ignition	2610	U	%	3.1	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0028	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0009	0.0087	0.5	10	70
Copper	1455	U	0.0011	0.011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0020	0.020	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.50	5.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	21

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335219						
Sample Ref:	AA156970						
Sample ID:							
Sample Location:	TP20						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.30	3	5	6
Loss On Ignition	2610	U	%	7.4	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0020	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0005	0.0052	0.5	10	70
Copper	1455	U	0.0007	0.0069	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0017	0.017	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.7	17	800	15000	25000
Fluoride	1220	U	0.55	5.5	10	150	500
Sulphate	1220	U	1.5	15	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	29	290	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335220						
Sample Ref:	AA18363						
Sample ID:							
Sample Location:	TP21						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.71	3	5	6
Loss On Ignition	2610	U	%	1.2	--	--	10
Total BTEX	2760	U	mg/kg	[AC] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[AC] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[AC] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0034	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0057	0.5	10	70
Copper	1455	U	0.0018	0.018	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0052	0.052	0.5	10	30
Nickel	1455	U	0.0018	0.018	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.96	9.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	72	720	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335221						
Sample Ref:	AA156961						
Sample ID:							
Sample Location:	TP23						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.44	3	5	6
Loss On Ignition	2610	U	%	5.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0023	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0021	0.021	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.0	20	800	15000	25000
Fluoride	1220	U	0.34	3.4	10	150	500
Sulphate	1220	U	1.5	15	1000	20000	50000
Total Dissolved Solids	1020	N	65	650	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	35	350	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336011						
Sample Ref:	AA160297						
Sample ID:							
Sample Location:	TP07						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.30	3	5	6
Loss On Ignition	2610	U	%	1.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0023	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0012	0.012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0010	0.0095	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.20	2.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	46	460	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	10

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336013						
Sample Ref:	AA156966						
Sample ID:							
Sample Location:	TP11						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.89	3	5	6
Loss On Ignition	2610	U	%	4.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.014	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0067	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0007	0.0068	0.5	10	70
Copper	1455	U	0.0025	0.025	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0022	0.022	0.5	10	30
Nickel	1455	U	0.0018	0.018	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.005	0.051	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.66	6.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	31	310	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336014						
Sample Ref:	AA18365						
Sample ID:							
Sample Location:	TP12						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.38	3	5	6
Loss On Ignition	2610	U	%	3.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0055	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0061	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0025	0.025	0.5	10	30
Nickel	1455	U	0.0016	0.016	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.003	0.032	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.79	7.9	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	64	640	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	33	330	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336017						
Sample Ref:	AA156972						
Sample ID:							
Sample Location:	TP22						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.1	3	5	6
Loss On Ignition	2610	U	%	4.1	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.020	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0007	0.0075	0.5	10	70
Copper	1455	U	0.0014	0.014	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0021	0.021	0.5	10	30
Nickel	1455	U	0.0005	0.0054	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.2	22	800	15000	25000
Fluoride	1220	U	0.55	5.5	10	150	500
Sulphate	1220	U	4.0	40	1000	20000	50000
Total Dissolved Solids	1020	N	100	1000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339081						
Sample Ref:	AA150909						
Sample ID:							
Sample Location:	TP06						
Top Depth(m):	0.6						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.47	3	5	6
Loss On Ignition	2610	U	%	3.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.036	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0066	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.10	1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	29	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339085						
Sample Ref:	AA150913						
Sample ID:							
Sample Location:	TP13						
Top Depth(m):	0.3						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.65	3	5	6
Loss On Ignition	2610	U	%	3.8	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.037	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0005	0.0052	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.090	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	26	260	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	15

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339089						
Sample Ref:	AA156962						
Sample ID:							
Sample Location:	TP23						
Top Depth(m):	1.5						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.60	3	5	6
Loss On Ignition	2610	U	%	2.7	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.023	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0027	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0040	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.088	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	20	190	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	2.9	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	32

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339090						
Sample Ref:	AA160295						
Sample ID:							
Sample Location:	TP24						
Top Depth(m):	0.5						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.24	3	5	6
Loss On Ignition	2610	U	%	2.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] 65	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.089	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0005	0.0055	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0003	0.0028	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.093	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	29	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1335207	AA150903		TP01		A	Amber Glass 250ml
1335208	AA150901		TP02		A	Amber Glass 250ml
1335209	AA150905		TP03		A	Amber Glass 250ml
1335210	AA18359		TP08		A	Amber Glass 250ml
1335211	AA160299		TP09		A	Amber Glass 250ml
1335211	AA160299		TP09		A	Plastic Tub 500g
1335212	AA150907		TP10		A	Amber Glass 250ml
1335213	AA150915		TP14		AC	Plastic Tub 500g
1335214	AA156960		TP16		A	Amber Glass 250ml
1335215	AA156973		TP17		A	Amber Glass 250ml
1335215	AA156973		TP17		A	Plastic Tub 500g
1335216	AA156974		TP17		A	Amber Glass 250ml
1335217	AA18361		TP18		A	Amber Glass 250ml
1335218	AA156957		TP19		A	Plastic Tub 500g
1335219	AA156970		TP20		A	Amber Glass 250ml
1335219	AA156970		TP20		A	Plastic Tub 500g
1335220	AA18363		TP21		AC	Plastic Tub 500g
1335221	AA156961		TP23		A	Amber Glass 250ml
1335221	AA156961		TP23		A	Plastic Tub 500g
1335222			TP12		A	Plastic Tub 500g
1336011	AA160297		TP07		A	Amber Glass 250ml

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1336011	AA160297		TP07		A	Plastic Tub 500g
1336013	AA156966		TP11		A	Amber Glass 250ml
1336014	AA18365		TP12		A	Amber Glass 250ml
1336017	AA156972		TP22		A	Amber Glass 250ml
1336017	AA156972		TP22		A	Plastic Tub 500g
1339081	AA150909		TP06		A	Amber Glass 250ml
1339081	AA150909		TP06		A	Plastic Tub 500g
1339082	AA150910		TP06		A	Amber Glass 250ml
1339082	AA150910		TP06		A	Plastic Tub 500g
1339085	AA150913		TP13		A	Amber Glass 250ml
1339085	AA150913		TP13		A	Plastic Tub 500g
1339089	AA156962		TP23		A	Amber Glass 250ml
1339089	AA156962		TP23		A	Plastic Tub 500g
1339090	AA160295		TP24		A	Amber Glass 250ml
1339090	AA160295		TP24		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.

Test Methods

SOP	Title	Parameters included	Method summary
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix 3

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:

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

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

6XQ88-E4XXN-VXRA6

Job name

22-001-03 Cellbridge

Description/Comments

Project

22-001-03

Site

Cellbridge

Classified by

Name:
Austin Hynes
Date:
17 Jan 2022 15:41 GMT
Telephone:
+353 (0)21 4345366

Company:
O'Callaghan Moran & Associates
Unit 15 Melbourne Business Park,
Model Farm Road
Cork

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: -

Course	Date
Hazardous Waste Classification	-

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01	0.40	Non Hazardous		3
2	TP02	0.30	Non Hazardous		6
3	TP08	0.50	Non Hazardous		9
4	TP10	0.80	Non Hazardous		12
5	TP14	0.30	Non Hazardous		15
6	TP16	0.50	Non Hazardous		18
7	TP17	0.50	Non Hazardous		21
8	TP18	0.50	Non Hazardous		24
9	TP20	0.50	Non Hazardous		27
10	TP21	0.50	Non Hazardous		30
11	TP23	0.50	Non Hazardous		33
12	TP07	0.50	Non Hazardous		36
13	TP11	0.50	Non Hazardous		39
14	TP12	0.50	Non Hazardous		42
15	TP22	0.50	Non Hazardous		45
16	TP06	0.6	Non Hazardous		48
17	TP13	0.3	Non Hazardous		51
18	TP23[2]	1.5	Non Hazardous		54
19	TP24	0.5	Non Hazardous		57

Related documents

#	Name	Description
1	OCM Waste Stream Updated 2021	waste stream template used to create this Job

Report

Created by: Austin Hynes

Created date: 17 Jan 2022 15:41 GMT

Appendices	Page
Appendix A: Classifier defined and non EU CLP determinands	60

Appendices	Page
Appendix B: Rationale for selection of metal species	61
Appendix C: Version	62

Classification of sample: TP01

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

Sample details

Sample name:
TP01
Sample Depth:
0.40 m
Moisture content:
29%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 29% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.8 mg/kg	1.32	8.978 mg/kg	0.000898 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.49 mg/kg	3.22	1.578 mg/kg	0.000158 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.91 mg/kg	1.142	1.04 mg/kg	0.000104 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15 mg/kg	1.126	16.888 mg/kg	0.00169 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16 mg/kg	1.56	24.957 mg/kg	0.0016 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2 mg/kg	1.5	3 mg/kg	0.0003 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24 mg/kg	2.976	71.43 mg/kg	0.00714 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.29 mg/kg	2.554	0.741 mg/kg	0.0000741 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		89 mg/kg	2.774	246.899 mg/kg	0.0247 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0402 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02

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

Sample details

Sample name:
TP02
Sample Depth:
0.30 m
Moisture content:
35%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 35% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.42 mg/kg	3.22	1.352 mg/kg	0.000135 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.1 mg/kg	1.142	2.399 mg/kg	0.00024 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		34 mg/kg	1.126	38.28 mg/kg	0.00383 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	21 mg/kg	1.56	32.756 mg/kg	0.0021 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.13 mg/kg	1.353	0.176 mg/kg	0.0000176 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.1 mg/kg	1.5	4.651 mg/kg	0.000465 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		69 mg/kg	2.976	205.362 mg/kg	0.0205 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.2 mg/kg	2.554	3.065 mg/kg	0.000306 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120 mg/kg	2.774	332.898 mg/kg	0.0333 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
17		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
18		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
19		xylene	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]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26		anthracene		204-371-1	120-12-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
27		fluoranthene		205-912-4	206-44-0		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
37		phenol	604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
									Total:	0.0672 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP08

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

Sample details

Sample name:
TP08
Sample Depth:
0.50 m
Moisture content:
30%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 30% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4 mg/kg	1.32	12.411 mg/kg	0.00124 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.6 mg/kg	3.22	5.152 mg/kg	0.000515 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.713 mg/kg	0.000171 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	29.231 mg/kg	0.00292 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22 mg/kg	1.126	24.77 mg/kg	0.00248 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26 mg/kg	1.56	40.555 mg/kg	0.0026 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.12 mg/kg	1.353	0.162 mg/kg	0.0000162 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<**LOD**
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39 mg/kg	2.976	116.074 mg/kg	0.0116 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.66 mg/kg	2.554	1.686 mg/kg	0.000169 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		87 mg/kg	2.774	241.351 mg/kg	0.0241 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				0.025	mg/kg		0.025	mg/kg	0.0000025 %		
			205-912-4	206-44-0									
28		pyrene				0.031	mg/kg		0.031	mg/kg	0.0000031 %		
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.026	mg/kg		0.026	mg/kg	0.0000026 %		
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.028	mg/kg		0.028	mg/kg	0.0000028 %		
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.031	mg/kg		0.031	mg/kg	0.0000031 %		
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.031	mg/kg		0.031	mg/kg	0.0000031 %		
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				0.054	mg/kg		0.054	mg/kg	0.0000054 %		
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				0.039	mg/kg		0.039	mg/kg	0.0000039 %		
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.022	mg/kg		0.022	mg/kg	0.0000022 %		
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				0.038	mg/kg		0.038	mg/kg	0.0000038 %		
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0477 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP10

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

Sample details

Sample name:
TP10
Sample Depth:
0.80 m
Moisture content:
20%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.6 mg/kg	1.142	2.97 mg/kg	0.000297 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26 mg/kg	1.462	38 mg/kg	0.0038 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37 mg/kg	1.126	41.658 mg/kg	0.00417 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	28 mg/kg	1.56	43.675 mg/kg	0.0028 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.1 mg/kg	1.353	0.135 mg/kg	0.0000135 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.7 mg/kg	1.5	4.051 mg/kg	0.000405 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		77 mg/kg	2.976	229.172 mg/kg	0.0229 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.39 mg/kg	2.554	0.996 mg/kg	0.0000996 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120 mg/kg	2.774	332.898 mg/kg	0.0333 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				2.8	mg/kg	1.884	5.275	mg/kg	0.000528 %		
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0718 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP14

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

Sample details

Sample name:
TP14
Sample Depth:
0.30 m
Moisture content:
22%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.48 mg/kg	3.22	1.546 mg/kg	0.000155 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.2 mg/kg	1.142	2.513 mg/kg	0.000251 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26 mg/kg	1.462	38 mg/kg	0.0038 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		31 mg/kg	1.126	34.903 mg/kg	0.00349 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	33 mg/kg	1.56	51.474 mg/kg	0.0033 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.11 mg/kg	1.353	0.149 mg/kg	0.0000149 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.7 mg/kg	1.5	4.051 mg/kg	0.000405 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		58 mg/kg	2.976	172.623 mg/kg	0.0173 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.56 mg/kg	2.554	1.43 mg/kg	0.000143 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120 mg/kg	2.774	332.898 mg/kg	0.0333 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0653 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP16

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

Sample details

Sample name:
TP16
Sample Depth:
0.50 m
Moisture content:
18%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	21.125 mg/kg	0.00211 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2 mg/kg	1.142	2.285 mg/kg	0.000228 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21 mg/kg	1.462	30.693 mg/kg	0.00307 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		40 mg/kg	1.126	45.036 mg/kg	0.0045 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	30 mg/kg	1.56	46.794 mg/kg	0.003 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.11 mg/kg	1.353	0.149 mg/kg	0.0000149 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.3 mg/kg	1.5	4.951 mg/kg	0.000495 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		77 mg/kg	2.976	229.172 mg/kg	0.0229 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.76 mg/kg	2.554	1.941 mg/kg	0.000194 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110 mg/kg	2.774	305.156 mg/kg	0.0305 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0687 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP17

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

Sample details

Sample name:
TP17
Sample Depth:
0.50 m
Moisture content:
23%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.41 mg/kg	3.22	1.32 mg/kg	0.000132 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.713 mg/kg	0.000171 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37 mg/kg	1.126	41.658 mg/kg	0.00417 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	29 mg/kg	1.56	45.235 mg/kg	0.0029 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.4 mg/kg	1.5	5.101 mg/kg	0.00051 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		63 mg/kg	2.976	187.505 mg/kg	0.0188 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.1 mg/kg	2.554	2.809 mg/kg	0.000281 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120 mg/kg	2.774	332.898 mg/kg	0.0333 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
19		xylene	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]		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		anthracene		204-371-1	120-12-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
27		fluoranthene		205-912-4	206-44-0		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
30		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
37		phenol	604-001-00-2	203-632-7	108-95-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
											Total:	0.0665 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP18

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

Sample details

Sample name:
TP18
Sample Depth:
0.50 m
Moisture content:
21%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.2 mg/kg	1.142	2.513 mg/kg	0.000251 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27 mg/kg	1.126	30.399 mg/kg	0.00304 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	31 mg/kg	1.56	48.354 mg/kg	0.0031 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.1 mg/kg	1.5	3.15 mg/kg	0.000315 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		58 mg/kg	2.976	172.623 mg/kg	0.0173 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.45 mg/kg	2.554	1.149 mg/kg	0.000115 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		150 mg/kg	2.774	416.122 mg/kg	0.0416 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0722 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP20

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

Sample details

Sample name:
TP20
Sample Depth:
0.50 m
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2 mg/kg	1.197	2.394 mg/kg	0.000239 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		34 mg/kg	1.32	44.891 mg/kg	0.00449 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		**<LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.8 mg/kg	1.142	3.199 mg/kg	0.00032 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		**<LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27 mg/kg	1.126	30.399 mg/kg	0.00304 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	52 mg/kg	1.56	81.11 mg/kg	0.0052 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.11 mg/kg	1.353	0.149 mg/kg	0.0000149 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.9 mg/kg	1.5	4.351 mg/kg	0.000435 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		69 mg/kg	2.976	205.362 mg/kg	0.0205 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.3 mg/kg	2.554	0.766 mg/kg	0.0000766 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190 mg/kg	2.774	527.088 mg/kg	0.0527 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		**<LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0916 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP21

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

Sample details

Sample name:
TP21
Sample Depth:
0.50 m
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.97 mg/kg	1.142	1.108 mg/kg	0.000111 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24 mg/kg	1.126	27.021 mg/kg	0.0027 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	21 mg/kg	1.56	32.756 mg/kg	0.0021 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		48 mg/kg	2.976	142.861 mg/kg	0.0143 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		58 mg/kg	2.774	160.9 mg/kg	0.0161 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0406 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP23

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

Sample details

Sample name:
TP23
Sample Depth:
0.50 m
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	21.125 mg/kg	0.00211 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.4 mg/kg	1.142	1.599 mg/kg	0.00016 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26 mg/kg	1.126	29.273 mg/kg	0.00293 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	23 mg/kg	1.56	35.876 mg/kg	0.0023 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3 mg/kg	1.5	4.501 mg/kg	0.00045 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		59 mg/kg	2.976	175.6 mg/kg	0.0176 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.48 mg/kg	2.554	1.226 mg/kg	0.000123 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		88 mg/kg	2.774	244.125 mg/kg	0.0244 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.054 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP07

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

Sample details

Sample name:
TP07
Sample Depth:
0.50 m
Moisture content:
10%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% No Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<**LOD**
2		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
3		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4	mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<**LOD**
4		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.1	mg/kg	1.142	2.399	mg/kg	0.00024 %		
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5	mg/kg	2.27	<1.135	mg/kg	<0.000113 %		<**LOD**
7		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		29	mg/kg	1.126	32.651	mg/kg	0.00327 %		
8		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	24	mg/kg	1.56	37.436	mg/kg	0.0024 %		
9		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
10		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.2	mg/kg	1.5	4.801	mg/kg	0.00048 %		
11		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		78	mg/kg	2.976	232.149	mg/kg	0.0232 %		
12		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
13		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		89	mg/kg	2.774	246.899	mg/kg	0.0247 %		
14		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
15		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0616 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP11

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

Sample details

Sample name:
TP11
Sample Depth:
0.50 m
Moisture content:
17%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2 mg/kg	1.197	2.394 mg/kg	0.000239 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	25.086 mg/kg	0.00251 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.64 mg/kg	3.22	2.061 mg/kg	0.000206 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.4 mg/kg	1.142	2.742 mg/kg	0.000274 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23 mg/kg	1.462	33.616 mg/kg	0.00336 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32 mg/kg	1.126	36.028 mg/kg	0.0036 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	29 mg/kg	1.56	45.235 mg/kg	0.0029 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		60 mg/kg	2.976	178.576 mg/kg	0.0179 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110 mg/kg	2.774	305.156 mg/kg	0.0305 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0631 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP12

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

Sample details

Sample name:
TP12
Sample Depth:
0.50 m
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2.5 mg/kg	1.197	2.993 mg/kg	0.000299 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22 mg/kg	1.32	29.047 mg/kg	0.0029 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.5 mg/kg	1.142	3.998 mg/kg	0.0004 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30 mg/kg	1.462	43.847 mg/kg	0.00438 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		42 mg/kg	1.126	47.287 mg/kg	0.00473 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	52 mg/kg	1.56	81.11 mg/kg	0.0052 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.14 mg/kg	1.353	0.189 mg/kg	0.0000189 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.6 mg/kg	1.5	5.401 mg/kg	0.00054 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		93 mg/kg	2.976	276.793 mg/kg	0.0277 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.65 mg/kg	2.554	1.66 mg/kg	0.000166 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		230 mg/kg	2.774	638.054 mg/kg	0.0638 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
16		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
17		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
18		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
19		xylene	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]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26		anthracene		204-371-1	120-12-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
27		fluoranthene		205-912-4	206-44-0		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
37		phenol	604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
									Total:	0.111 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP22

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

Sample details

Sample name:
TP22
Sample Depth:
0.50 m
Moisture content:
17%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2.7 mg/kg	1.197	3.232 mg/kg	0.000323 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21 mg/kg	1.32	27.727 mg/kg	0.00277 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.48 mg/kg	3.22	1.546 mg/kg	0.000155 %		
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3 mg/kg	1.142	3.427 mg/kg	0.000343 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		41 mg/kg	1.126	46.161 mg/kg	0.00462 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	53 mg/kg	1.56	82.67 mg/kg	0.0053 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.15 mg/kg	1.353	0.203 mg/kg	0.0000203 %		
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.1 mg/kg	1.5	6.151 mg/kg	0.000615 %		
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		100 mg/kg	2.976	297.626 mg/kg	0.0298 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.4 mg/kg	2.554	3.575 mg/kg	0.000358 %		
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190 mg/kg	2.774	527.088 mg/kg	0.0527 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				0.036	mg/kg		0.036	mg/kg	0.0000036 %		
			205-912-4	206-44-0									
28		pyrene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.102 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06

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

Sample details

Sample name:
TP06
Sample Depth:
0.6 m
Moisture content:
17%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3.7 mg/kg	1.32	4.885 mg/kg	0.000489 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.48 mg/kg	1.142	0.548 mg/kg	0.0000548 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		8.1 mg/kg	1.462	11.839 mg/kg	0.00118 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15 mg/kg	1.126	16.888 mg/kg	0.00169 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	10 mg/kg	1.56	15.598 mg/kg	0.001 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		27 mg/kg	2.976	80.359 mg/kg	0.00804 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		32 mg/kg	2.774	88.773 mg/kg	0.00888 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0233 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP13

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

Sample details

Sample name:
TP13
Sample Depth:
0.3 m
Moisture content:
15%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.9 mg/kg	1.32	6.47 mg/kg	0.000647 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.69 mg/kg	1.142	0.788 mg/kg	0.0000788 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		10 mg/kg	1.462	14.616 mg/kg	0.00146 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12 mg/kg	1.126	13.511 mg/kg	0.00135 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	12 mg/kg	1.56	18.718 mg/kg	0.0012 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<**LOD**
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23 mg/kg	2.976	68.454 mg/kg	0.00685 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<**LOD**
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		47 mg/kg	2.774	130.385 mg/kg	0.013 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				6.1	mg/kg	1.884	11.492	mg/kg	0.00115 %		
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0276 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP23[2]

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

Sample details

Sample name:
TP23[2]
Sample Depth:
1.5 m
Moisture content:
32%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 32% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5.1 mg/kg	1.32	6.734 mg/kg	0.000673 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		8.3 mg/kg	1.462	12.131 mg/kg	0.00121 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		5.8 mg/kg	1.126	6.53 mg/kg	0.000653 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16 mg/kg	1.56	24.957 mg/kg	0.0016 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11 mg/kg	2.976	32.739 mg/kg	0.00327 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		8.6 mg/kg	2.774	23.858 mg/kg	0.00239 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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									
16		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
17		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
18		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
19		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		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]									
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
21		naphthalene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-883-8	191-24-2									
37		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
38		polychlorobiphenyls; PCB				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0118 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP24

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

Sample details

Sample name:
TP24
Sample Depth:
0.5 m
Moisture content:
17%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3.8 mg/kg	1.32	5.017 mg/kg	0.000502 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.45 mg/kg	1.142	0.514 mg/kg	0.0000514 %		
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		5.2 mg/kg	1.462	7.6 mg/kg	0.00076 %		
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9.5 mg/kg	1.126	10.696 mg/kg	0.00107 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	4.7 mg/kg	1.56	7.331 mg/kg	0.00047 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23 mg/kg	2.976	68.454 mg/kg	0.00685 %		
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		21 mg/kg	2.774	58.257 mg/kg	0.00583 %		
14	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
19		xylene	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]		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
20		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		5.9	mg/kg		5.9	mg/kg	0.00059 %		
26		anthracene		204-371-1	120-12-7		2.5	mg/kg		2.5	mg/kg	0.00025 %		
27		fluoranthene		205-912-4	206-44-0		11	mg/kg		11	mg/kg	0.0011 %		
28		pyrene		204-927-3	129-00-0		8.6	mg/kg		8.6	mg/kg	0.00086 %		
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		6.5	mg/kg		6.5	mg/kg	0.00065 %		
30		chrysene	601-048-00-0	205-923-4	218-01-9		5.9	mg/kg		5.9	mg/kg	0.00059 %		
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		8.7	mg/kg		8.7	mg/kg	0.00087 %		
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		3	mg/kg		3	mg/kg	0.0003 %		
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		5.3	mg/kg		5.3	mg/kg	0.00053 %		
34		indeno[123-cd]pyrene		205-893-2	193-39-5		3.7	mg/kg		3.7	mg/kg	0.00037 %		
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		1.3	mg/kg		1.3	mg/kg	0.00013 %		
36		benzo[ghi]perylene		205-883-8	191-24-2		3.1	mg/kg		3.1	mg/kg	0.00031 %		
37		phenol	604-001-00-2	203-632-7	108-95-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
											Total:	0.024 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non EU CLP determinands

- **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

- **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

- **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

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

EU CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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 (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021
HazWasteOnline Classification Engine Version: 2022.11.4970.9430 (11 Jan 2022)
HazWasteOnline Database: 2022.4.4967.9426 (04 Jan 2022)

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

Appendix C : Irish Water Confirmation of Feasibility

Niall O'Hare

DBFL

Ormond House
Upper Ormond Quay
Dublin 7
D07W704

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

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

www.water.ie

17 August 2021

Re: CDS21004893 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 350 units at Dublin Road, Celbridge, Co. Kildare

Dear Sir/Madam,

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

Strategic Housing Development

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. Therefore:

In advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible Subject to upgrades
Wastewater Connection	Feasible Subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	Connection to be to the adjacent 200mm network. In order to accommodate the proposed connection at the Development, upgrade works are required to increase the capacity the water network (approx. 400m of new 200mm watermain required to replace an existing 150mm watermain). Irish Water does not currently have any plans to carry out the works required to provide the necessary upgrade and capacity.

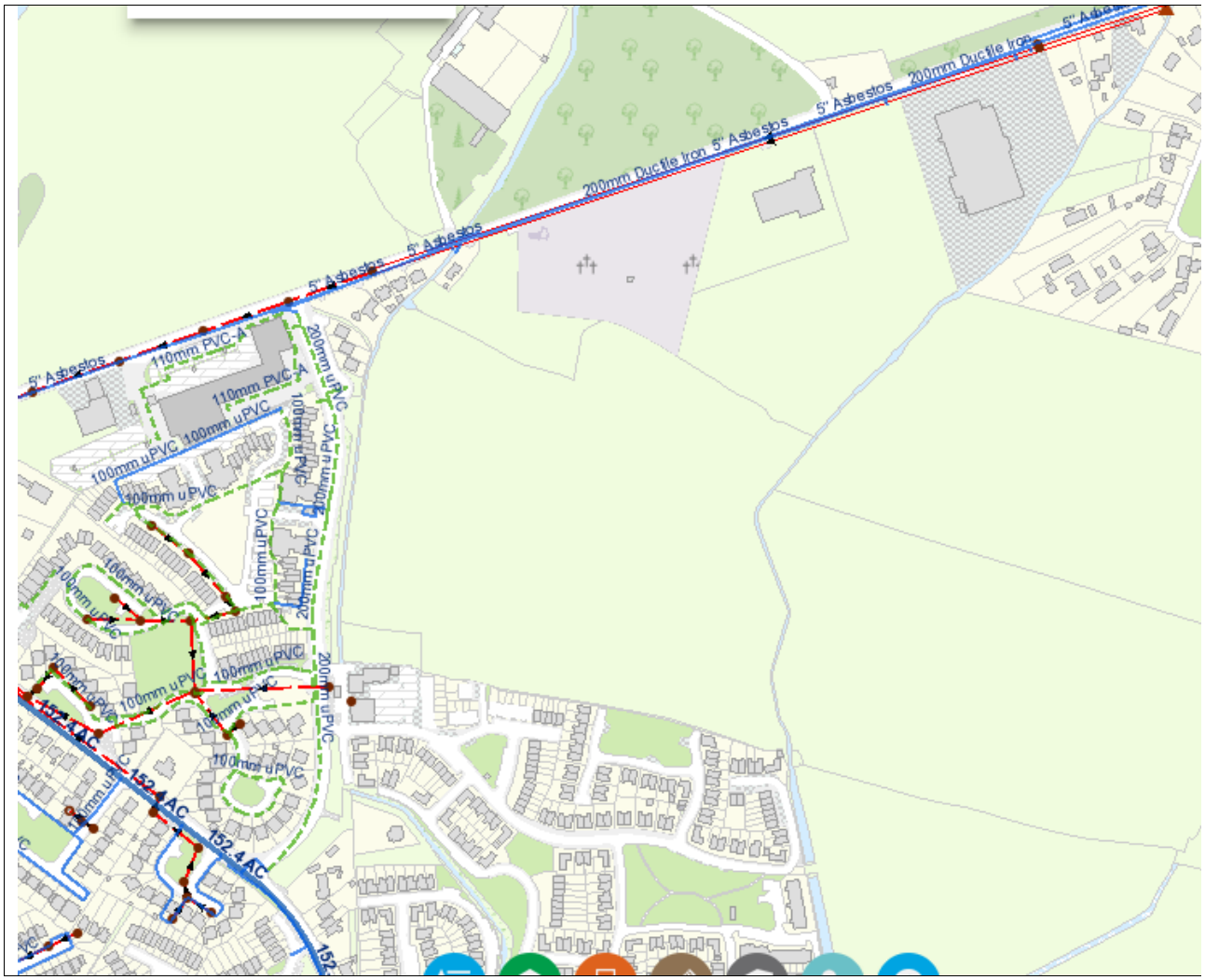
Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta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

IW-HP-BUS

REV012

	Should you wish to have such upgrade works progressed, Irish Water will require you to provide a contribution of a relevant portion of the costs for the required upgrades, please contact Irish Water to discuss this further
Wastewater Connection	There are significant wastewater network capacity constraints in the Celbridge area. Irish Water's Capital Investment Plan projects in the Lower Liffey Valley Catchment (Drainage Area Plan and the Primrose Hill Pumping Station Project) will provide strategic solutions to the overall capacity constraints. The Primrose Hill Pumping Station project is scheduled to be completed by Q4 2023 (this may be subject to change). Where an interim connection is proposed in advance of the delivery of strategic solutions in this area, Irish Water are willing to review Storm Sewer Separation proposals in the Primrose Hill Pumping Station catchment, in order to provide additional wastewater capacity. This would require co-operation from Kildare County Council, as the storm drainage authority. In addition, a wastewater network extension is required to facilitate this development. Irish Water currently has a project on our current investment plan which plans to deliver the required network extension. This upgrade project is currently scheduled to be completed by 2025 (this may be subject to change). In the case of wastewater connections, this assessment does not confirm that a gravity connection is achievable. Therefore, a suitably sized pumping station may be required to reach the existing public sewer. The pump station would need to be designed and installed in accordance with the Irish Water Code of Practice and Standard Details.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

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



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

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

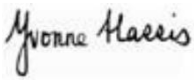
General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.

4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Fionán Ginty from the design team on 01 89 25734 087 1496032 or email fginty@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Appendix D : Irish Water Statement of Design Acceptance

Niall O'Hare
Ormond House
Upper Ormond Quay
Dublin 7, Dublin D07W704

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

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

www.water.ie

27 May 2022

Re: Design Submission for Dublin Road, Cellbridge, Kildare (the "Development") (the "Design Submission") / Connection Reference No: CDS21004893

Dear Niall O'Hare,

Many thanks for your recent Design Submission.

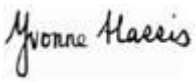
We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

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

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

If you have any further questions, please contact your Irish Water representative:
Name: Antonio Garzón
Phone: 0838983711
Email: antonio.garzon@water.ie

Yours sincerely,



Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- 180221-DBFL-FW-SP-DR-C-1100-Foul Drainage Overall
- 180221-DBFL-FW-SP-DR-C-1101-Foul Drainage - Sheet 1
- 180221-DBFL-FW-SP-DR-C-1102-Foul Drainage - Sheet 2
- 180221-DBFL-WM-SP-DR-C-1040 Watermain Layout Overall
- 180221-DBFL-WM-SP-DR-C-1041 Watermain Layout Sheet 1
- 180221-DBFL-WM-SP-DR-C-1042 Watermain Layout Sheet 2
- 180221-DBFL-FW-SP-M2-C-3100 Foul Network Longsection - Sheet 1
- 180221-DBFL-FW-SP-M2-C-3101 Foul Network Longsection - Sheet 2
- 180221-DBFL-FW-SP-M2-C-3102 Foul Network Longsection - Sheet 3
- 180221-DBFL-FW-SP-M2-C-3103 Foul Network Longsection - Sheet 4

Additional Comments

The design submission will be subject to further technical review at connection application stage.

This Statement of Design Acceptance does not extend to proposed pump station and rising main arrangements. The pump station and rising main will be vested at connection application stage.

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

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

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Dawn O'Driscoll, Maria O'Dwyer
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0 5 10 15 20 25 30 40 50mm

NOTES:

GENERAL NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
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3. ALL DIMENSIONS AND LEVELS ARE IN METERS AND ARE RELATED TO ORDINANCE DATUM. CO-ORDINATES RELATE TO ITM.
4. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
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6. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225mm DIAMETER CLASS H CONCRETE TO IS EN 1916 & IS 6 2004 OR UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2, MIN. JETTING RESISTANCE OF 180 BAR IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
7. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
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13. WHERE COVERS ARE LOCATED IN GRASS AREAS THEY SHALL BE SURROUNDED BY A CONCRETE PLINTH, 200MM ALL ROUND AND 100MM DEEP FORMED WITH C20/25 CONCRETE, 20MM AGGREGATE SIZE, BEDDED IN CLAUSE 808 MATERIAL.

LEGEND:

- SITE BOUNDARY
- PROPOSED ROAD
- PROPOSED FOOTPATH
- PROPOSED BUILDING
- PROPOSED CYCLE PATH
- PROPOSED SHARED PATH
- PROPOSED VERGE
- PROPOSED PERMEABLE PAVING
- 1:999 PROPOSED ROAD GRADIENT
- 99.99 PROPOSED ROAD LEVELS
- PROPOSED FOUL GRAVITY SEWER AND FOUL INSPECTION CHAMBER
- EI MH EXISTING FOUL GRAVITY SEWER AND FOUL INSPECTION CHAMBER
- PROPOSED 160MM OD HDPE SDR17 FOUL RISING MAIN
- PROPOSED SURFACE WATER SEWER AND STORM WATER INSPECTION CHAMBER
- SI SLUICE VALVES TO IRISH WATER STANDARD DETAIL STD-WW-17
- SC SCOUR VALVES TO IRISH WATER STANDARD DETAIL STD-WW-15
- AV AIR VALVE TO IRISH WATER STANDARD DETAIL STD-WW-18
- PROPOSED FOUL GRAVITY SEWER WITH CONCRETE SURROUND; FOR DEPTH OF COVER < 1.2m
- EXISTING STREAMS; HAZELHATCH WATERCOURSE (EAST) SHINKEEN STREAM (WEST)

TIE INTO EXISTING

TIE INTO EXISTING

TIE INTO EXISTING FOOTPATH

TIE INTO EXISTING

CONCRETE SURROUND TO BE INSTALLED WHERE DEPTH TO COVER IS < 1.2m

PROPOSED STREAM CROSSING FOR GRAVITY SEWER AS PER IRISH WATER DETAIL STD-WW-21

PROPOSED SPUR FOR FUTURE CONNECTION, WITH BLIND MANHOLE AND TEMPORARY BUNG INSTALLED IN OUTLET PIPE

PROPOSED 160mm OD HDPE SDR17 RISING MAIN

PROPOSED AIR VALVE/CHAMBER AS PER IRISH WATER DETAIL STD-WW-18

PROPOSED BRIDGE CROSSIG FOR RISING MAIN AS PER IRISH WATER DETAIL STD-WW-24

PROPOSED STREAM CROSSING FOR GRAVITY SEWER AS PER IRISH WATER DETAIL STD-WW-21

PROPOSED SCOUR VALVE CHAMBER: AS PER IRISH WATER DETAIL STD-WW-15

ANCHOR/THRUST BLOCKS SHALL BE PROVIDED ON RISING MAINS BENDS: AS PER IE STD-WW-14

PROPOSED EMERGENCY STORAGE CHAMBER (340 m³ PROVIDED)

PROPOSED RISING MAIN DISCHARGE MANHOLE AS PER IRISH WATER DETAIL STD-WW-29

CONNECTION TO PROPOSED IRISH WATER GRAVITY SEWER EXTENSION

Creche Pitx

Playground

Communal Courtyard

Playground

rev	date	description	by	chkd.
P04	25-05-22	SODA Comments Amendment 24/05/22	PLY	NOH
P03	18-05-22	SODA Comments Amendment	PLY	NOH
P02	14-04-22	File Size Reduction	PLY	NOH
P01	12-04-22	For SODA	PLY	NOH

client approval
- A - Approved
- B - Approved with comments
- C - Do not use

suitability: S3 - REVIEW | COMMENT

issue purpose: PLANNING

DBFL Consulting Engineers
Civil, Structural & Transportation Engineering
www.dbfl.ie

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CORK OFFICE: Phoenix House, Monahan Road, Cork, T12 H1XY
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WATERFORD OFFICE: Suite 8b The Atrium, Maritana Gate, Canada Street, Waterford, X91 W028
PHONE +353 51 309 500

project ref.

BALLYOULSTER KDA SHD - PHASE 1
RESIDENTIAL DEVELOPMENT

drawing title

FOUL DRAINAGE OVERALL

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:1250	A1

drawing no.: 180221-DBFL-FW-SP-DR-C-1100

revision: P04

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ORDNANCE SURVEY IRELAND LICENCE No EN 0017922
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rev	date	description	by	chkd
P04	25-05-22	SODA Comments Amendment 24/05/22	PLY	NOH
P03	14-04-22	File Size Reduction	PLY	NOH
P02	11-04-22	For SODA	PLY	NOH
P01	04-11-21	ISSUED FOR PLANNING	PLY	NOH

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S3 - REVIEW & COMMENT — issue purpose: PLANNING

DBFL Consulting Engineers
Civil, Structural & Transportation Engineering
www.dbfl.ie
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PHONE +353 21 2124438
WATERFORD OFFICE: Suite B6 The Atrium, Maritana Gate, Canada Street, Waterford, X91 W0Z8
PHONE +353 51 304 500

project ref.

BALLYOULSTER KDA SHD - PHASE 1 RESIDENTIAL DEVELOPMENT

drawing title

FOUL DRAINAGE - SHEET 1

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:500	A0

drawing no. 180221-DBFL-FW-SP-DR-C-1101 — revision P04

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ON ORIGINAL

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GOVERNMENT OF IRELAND

rev	date	description	by	chkd
P04	25-05-22	SODA Comments Amendment 24/05/22	PLY	NOH
P03	14-04-22	File Size Reduction	PLY	NOH
P02	11-04-22	For SODA	PLY	NOH
P01	04-11-21	ISSUED FOR PLANNING	PLY	NOH

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S3 - REVIEW & COMMENT

issue purpose: PLANNING

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project ref.

BALLYOULSTER KDA SHD - PHASE 1
RESIDENTIAL DEVELOPMENT

drawing title

FOUL DRAINAGE - SHEET 2

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:500	A0

drawing no. 180221-DBFL-FW-SP-DR-C-1102

revision P04

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ON ORIGINAL

0 5 10 15 20 30 40 50mm

NOTES:

GENERAL NOTES:

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2. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS AND LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE.
3. ALL DIMENSIONS AND LEVELS ARE IN METERS AND ARE RELATED TO ORDINANCE DATUM. CO-ORDINATES RELATE TO IRISH NATIONAL GRID.
4. ALL WATERMAINS VALVES AND FITTINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE IRISH WATER STANDARD DETAILS AND IRISH WATER CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
5. ALL WATERMAINS SHALL BE HDPE, PE100, SDR17 TO IS EN 12201 PART 2:2011 AND IS EN 12201-3:2011.
6. CONNECTION BETWEEN EXISTING AND PROPOSED WATERMAINS TO BE CARRIED OUT IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS STD-W-03 TO STD-W-10.
7. ANCHOR BLOCKS TO BE POSITIONED AT DEAD ENDS, TEES, BENDS AND AT EACH SIDE OF HYDRANTS AND VALVES IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER STANDARD DETAIL STD-W-28 (WATER MAIN THRUST AND SUPPORT BLOCKS.DISMANTLING JOINTS TO BE INSTALLED AT EACH SLUICE VALVE AS PER IRISH WATER STANDARD DETAIL STD-W-15.
8. CONNECTION TO INDIVIDUAL HOUSES IN ACCORDANCE WITH IRISH WATER STD-W-03.
9. INSTALLATION OF SLUICE VALVES, AIR VALVES AND HYDRANTS SHALL BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS STD-W-14 TO STD-W-23.
10. MARKER POSTS AND PLATES ARE TO BE PROVIDED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-W-27.
11. CONNECTION TO EXISTING WATERMAINS TO BE COORDINATED BY THE CONTRACTOR WITH IRISH WATER AND/OR THE LOCAL AUTHORITY.
12. CONTRACTOR TO LIASE WITH IRISH WATER AND / OR THE LOCAL AUTHORITY AS REQUIRED REGARDING TESTING, CLEANSING AND STERILISATION OF WATERMAINS
13. WATERMAINS TO BE PRESSURE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER AND IGN 4-01-03, GUIDE TO TESTING OF PRESSURE PIPES AND FITTINGS FOR USE BY PUBLIC WATER SUPPLIERS, OCTOBER 2015. A FORMAL TEST REPORT SHALL BE SUBMITTED TO THE ENGINEER DETAILING THE TEST CARRIED OUT.
14. METERS FOR APARTMENTS OR SIMILAR PROPERTIES WILL BE INSTALLED INTERNALLY WITHIN THE PREMISES IN ACCORDANCE WITH THE BUILDING CONTROLS AUTHORITY REQUIREMENTS AND SUBJECT TO REVIEW BY IRISH WATER

PROPOSED CONNECTION TO EXISTING 200MM DUCTILE IRON WATERMAIN

TIE INTO EXISTING

PROPOSED FLOW METER CHAMBER AND TELEMENTRY KIOSK

PROPOSED ON-LINE AIR VALVE, AS PER IRISH WATER DETAIL STD-W-22

PROPOSED SCOUR VALVE CHAMBER AND HEAD WALL ARRANGEMENT; AS PER DETAIL STD-W-30

PROPOSED STREAM CROSSING FOR WATER MAIN, AS PER DETAIL STD-W-31A

PROPOSED HYDRANT IN VERGE, TO BE SURROUNDED BY CONCRETE PLINTH, REFER TO SECTION 3.18 OF IW COP

TIE INTO EXISTING

TIE INTO EXISTING

PROPOSED BULK METER TO BE SUPPLIED AND INSTALLED BY IW

PROPOSED OD 90MM SERVICE CONNECTION TO CRECHE

TIE INTO EXISTING

PROPOSED SCOUR VALVE CONNECTION TO SURFACE WATER NETWORK; AS PER DETAIL STD-W-30B

PROPOSED TYPICAL BRIDGE CONNECTION FOR WATER MAIN; AS PER DETAIL STD-W-32

LEGEND:

- SITE BOUNDARY
- PROPOSED ROAD
- PROPOSED FOOTPATH
- PROPOSED BUILDING
- PROPOSED CYCLE PATH
- PROPOSED SHARED PATH
- PROPOSED VERGE
- PROPOSED PERMEABLE PAVING
- PROPOSED ROAD GRADIENT (1:999)
- PROPOSED ROAD LEVELS (99.99)
- EXISTING 200MM DUCTILE IRON WATERMAIN
- PROPOSED 200MM (INTERNAL DIAMETER) WATERMAIN
- PROPOSED 150MM (INTERNAL DIAMETER) WATERMAIN
- SLUICE VALVES TO IRISH WATER STANDARD DETAIL STD-W-14/15
- SCOUR VALVES TO IRISH WATER STANDARD DETAIL STD-W-30/30A/30B
- HYDRANTS TO IRISH WATER STANDARD DETAIL STD-W-16/18
- METER CHAMBER TO IRISH WATER STANDARD STD-W-26
- METER CHAMBER TO IRISH WATER STANDARD STD-W-26G
- TELEMENTRY KIOSK (AS PER IRISH WATER STD-W-36)
- AIR VALVE TO IRISH WATER STANDARD DETAIL STD-W-20/22
- IRISH WATER SERVICE CONNECTION WITH BOUNDARY BOX TO IRISH WATER STANDARD STD-W-03
- EXISTING STREAMS; HAZELHATCH WATERCOURSE (EAST) SHINKEEN STREAM (WEST)

rev	date	description	by	chkd.
P04	25-05-22	SODA Comments Amendment 24/05/22	PLY	NOH
P03	18-05-22	SODA Comments Amendment	PLY	NOH
P02	14-04-22	File Size Reduction	PLY	NOH
P01	12-04-22	For SODA	PLY	NOH

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S3 - REVIEW & COMMENT

issue purpose: PLANNING

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project ref.

BALLYOULSTER KDA SHD - PHASE 1
RESIDENTIAL DEVELOPMENT

drawing title

WATERMAIN LAYOUT OVERALL

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:1250	A1

drawing no.: 180221-DBFL-WM-SP-DR-C-1040

revision: P04

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0 5 10 20 30 40 50m

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LEGEND:

- SITE BOUNDARY
- PROPOSED ROAD
- PROPOSED FOOTPATH
- PROPOSED BUILDING
- PROPOSED CYCLE PATH
- PROPOSED SHARED PATH
- PROPOSED VERGE
- PROPOSED PERMEABLE PAVING
- 1:99 PROPOSED ROAD GRADIENT
- 99.99 PROPOSED ROAD LEVELS
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- METER CHAMBER TO IRISH WATER STANDARD STD-W-26
- METER CHAMBER TO IRISH WATER STANDARD STD-W-24O
- TELEMENTRY KIOSK (AS PER IRISH WATER STD-W-36)
- AIR VALVE TO IRISH WATER STANDARD DETAIL STD-W-20/22
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- EXISTING STREAMS; HAZELHATCH WATERCOURSE (EAST) SHINKEEN STREAM (WEST)

rev	date	description	by	chkd
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P02	14-04-22	For SODA	PLY	NOH
P01	04-11-21	ISSUED FOR PLANNING	PLY	NOH

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issue purpose: PLANNING

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project ref.

BALLYOULSTER KDA SHD - PHASE 1 RESIDENTIAL DEVELOPMENT

drawing title

WATERMAIN LAYOUT SHEET 1

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:500	A0

drawing no. 180221-DBFL-WM-SP-DR-C-1041 | revision P04

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0 5 10 15 20 30 40 50m

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- M METER CHAMBER TO IRISH WATER STANDARD STD-W-26
- M METER CHAMBER TO IRISH WATER STANDARD STD-W-26D
- K TELEMENTRY KIOSK (AS PER IRISH WATER STD-W-36)
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P04	25-05-22	SODA Comments Amendment 24/05/22	PLY	NOH
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P02	14-04-22	For SODA	PLY	NOH
P01	04-11-21	ISSUED FOR PLANNING	PLY	NOH

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project ref.

BALLYOULSTER KDA SHD - PHASE 1
RESIDENTIAL DEVELOPMENT

drawing title

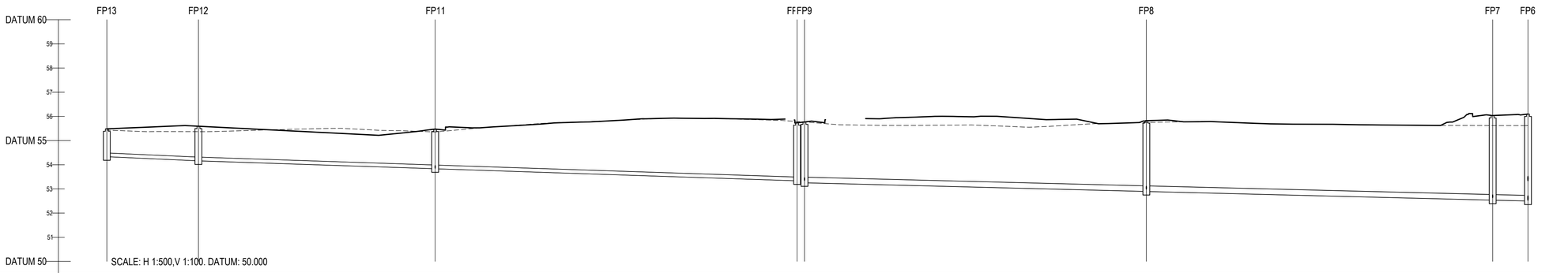
WATERMAIN LAYOUT SHEET 2

client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	1:500	A0

drawing no. 180221-DBFL-WM-SP-DR-C-1042 revision P04


FP13
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FP7
FP6
DATUM 60
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DATUM 55
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DATUM 50
SCALE: H 1:500,V 1:100. DATUM: 50.000

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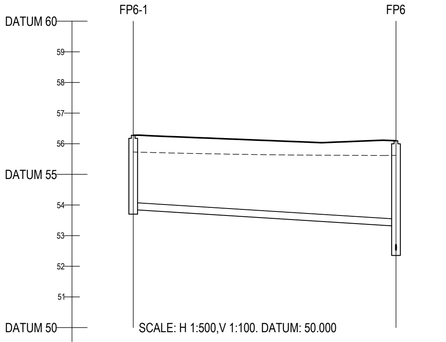
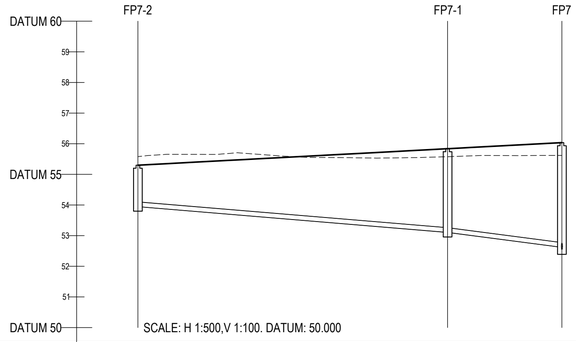
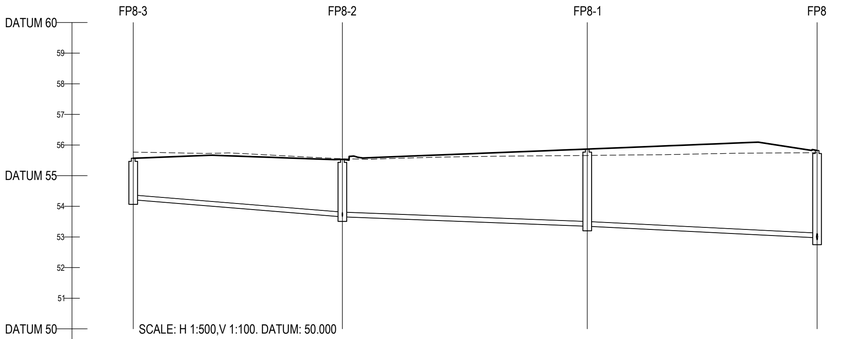


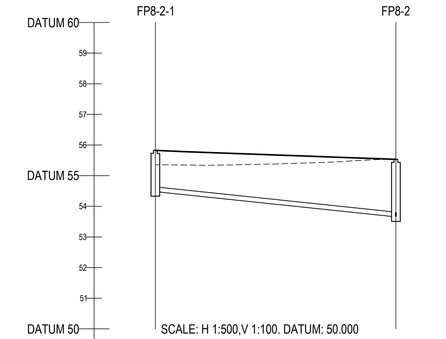
COVER LEVEL	56.276		56.098
INVERT LEVEL	53.851	53.315	
DEPTH (m)	2.425		3.696
DISTANCE (m)	42.89		
PIPE SLOPE	1:80		
PIPE SIZE	225mm		



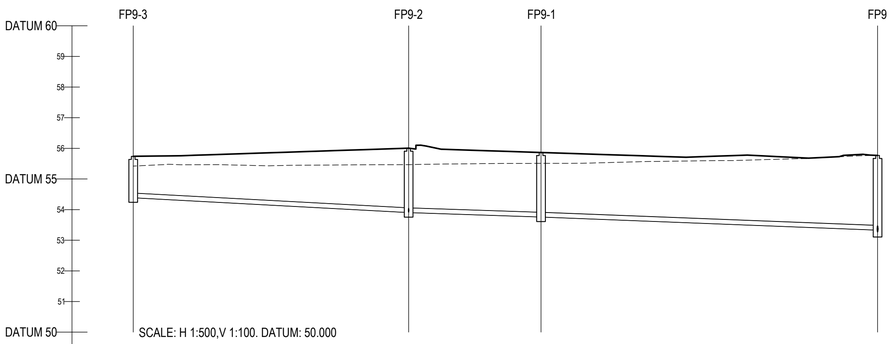
COVER LEVEL	55.299	55.839	56.035
INVERT LEVEL	53.949	53.107 / 53.107	52.620
DEPTH (m)	1.350	2.732	3.407
DISTANCE (m)	50.55	18.66	
PIPE SLOPE	1:60	1:38	
PIPE SIZE	150mm	150mm	



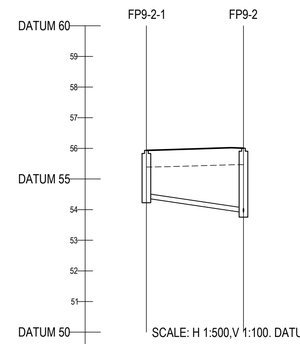
COVER LEVEL	55.568	55.533	55.888	55.823
INVERT LEVEL	54.215	53.658 / 53.658	53.351 / 53.351	52.975
DEPTH (m)	1.353	1.875	2.517	2.848
DISTANCE (m)	34.15	39.97	37.52	
PIPE SLOPE	1:61	1:130	1:100	
PIPE SIZE	150mm	150mm	150mm	



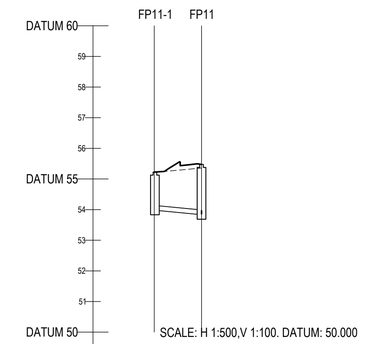
COVER LEVEL	55.827		55.533
INVERT LEVEL	54.481	53.658	
DEPTH (m)	1.346		1.875
DISTANCE (m)	39.27		
PIPE SLOPE	1:48		
PIPE SIZE	150mm		



COVER LEVEL	55.738	56.006	55.884	55.769
INVERT LEVEL	54.388	53.905 / 53.905	53.760 / 53.760	53.332
DEPTH (m)	1.350	2.102	2.104	2.512
DISTANCE (m)	44.96	21.62	54.94	
PIPE SLOPE	1:93	1:149	1:128	
PIPE SIZE	150mm	150mm	150mm	



COVER LEVEL	55.933	56.006	
INVERT LEVEL	54.373	53.904	
DEPTH (m)	1.560	2.102	
DISTANCE (m)	15.85		
PIPE SLOPE	1:34		
PIPE SIZE	150mm		



COVER LEVEL	55.225	55.476	
INVERT LEVEL	53.983	53.836	
DEPTH (m)	1.242	1.640	
DISTANCE (m)	7.61		
PIPE SLOPE	1:52		
PIPE SIZE	150mm		

KEY

EXISTING GROUND PROFILE

PROPOSED GROUND PROFILE

ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

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4. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

rev	date	description	by	chkd.
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P01	18-10-21	ISSUED FOR PLANNING	GIS	NOH

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project ref:

BALLYOULSTER KDA SHD - PHASE 1 RESIDENTIAL DEVELOPMENT

drawing title:

FOUL NETWORK LONGSECTION - SHEET 2

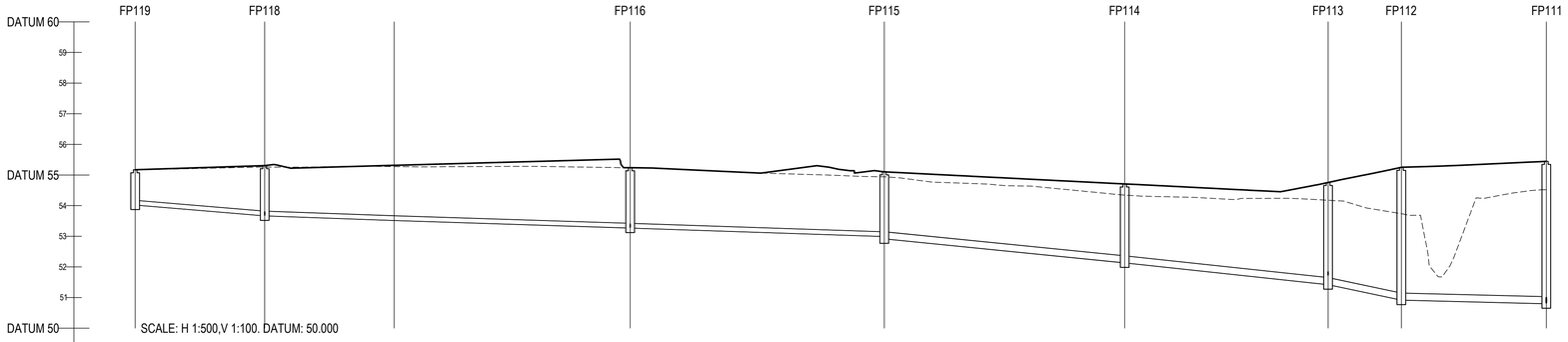
client:

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

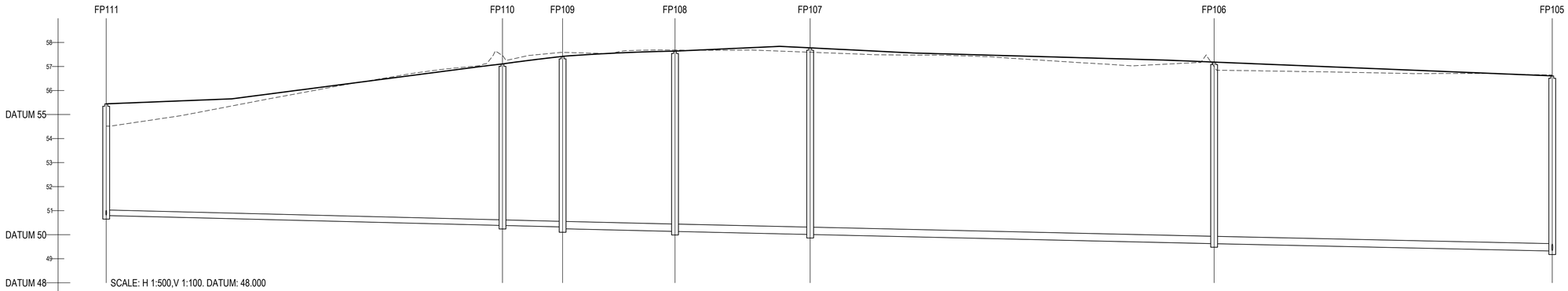
designed by	author	scale	sheet size
PLY	PLY	AS SHOWN	A1

drawing no.: 180221-DBFL-FW-SP-M2-C-3101

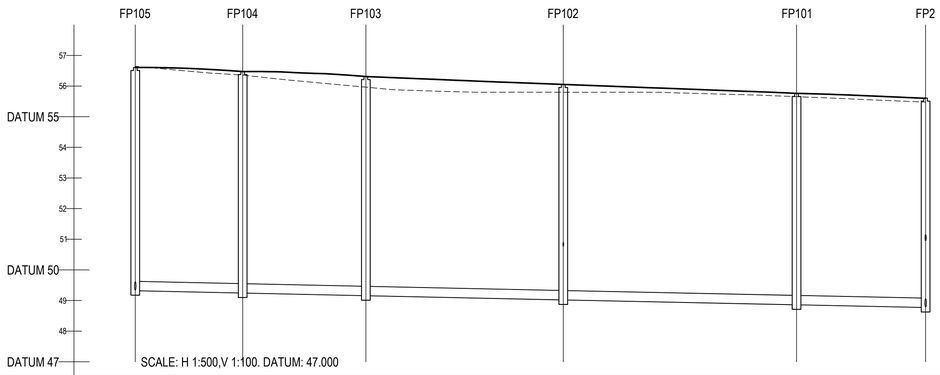
revision: P02



COVER LEVEL	55.171	55.306	55.226	55.103	54.708	54.756	55.250	55.446	
INVERT LEVEL	54.021	53.668	53.668 / 53.517 / 53.517	53.270	53.270	52.919	52.134	51.423	50.918 / 50.918	50.800
DEPTH (m)	1.150	1.638	1.558	2.184	2.574	3.333	4.332	4.646	
DISTANCE (m)	21.15	21.14	38.56	41.51	39.27	33.22	11.96	23.68	
PIPE SLOPE	1:60	1:140	1:156	1:150	1:50	1:47	1:24	1:200	
PIPE SIZE	150mm	150mm	150mm	150mm	225mm	225mm	225mm	225mm	



COVER LEVEL	56.446	57.108	57.419	57.639	57.776	57.183	56.608
INVERT LEVEL	50.800	50.388 / 50.388	50.325 / 50.250	50.139 / 50.139	50.011 / 50.011	49.629 / 49.629	49.323
DEPTH (m)	4.646	6.720	7.169	7.500	7.765	7.554	7.285
DISTANCE (m)	82.39	12.50	23.36	28.10	84.00	70.29	
PIPE SLOPE	1:200	1:198	1:210	1:219	1:220	1:230	
PIPE SIZE	225mm	225mm	300mm	300mm	300mm	300mm	



COVER LEVEL	56.608	56.474	56.312	56.053	55.762	55.606
INVERT LEVEL	49.323	49.247 / 49.247	49.160 / 49.160	49.022 / 49.022	48.863 / 48.863	48.775
DEPTH (m)	7.285	7.227	7.152	7.031	6.899	6.831
DISTANCE (m)	17.53	20.11	32.23	38.07	21.07	
PIPE SLOPE	1:231	1:231	1:234	1:239	1:239	
PIPE SIZE	300mm	300mm	300mm	300mm	300mm	

ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

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NO CHANGES OF WHATSOEVER NATURE ARE TO BE MADE TO ANY DETAILS SET OUT OR CONTAINED IN ANY DBFL SPECIFICATIONS OR DRAWINGS UNLESS THE EXPRESS CONSENT HAS BEEN OBTAINED IN ADVANCE, IN WRITING, FROM DBFL.

NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES
2. ALL LEVELS ARE IN METRES AND ARE RELATED TO ORDNANCE DATUM
3. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF PAVEMENT LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE
4. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

KEY

EXISTING GROUND PROFILE

PROPOSED GROUND PROFILE

rev	date	description	by	chkd.
P02	11-04-22	FOR SODA	PLY	NOH
P01	18-10-21	ISSUED FOR PLANNING	GIS	NOH

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S0 - WORK IN PROGRESS

issue purpose: PLANNING

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BALLYOULSTER KDA SHD - PHASE 1 RESIDENTIAL DEVELOPMENT

drawing title

FOUL NETWORK LONGSECTION - SHEET 3

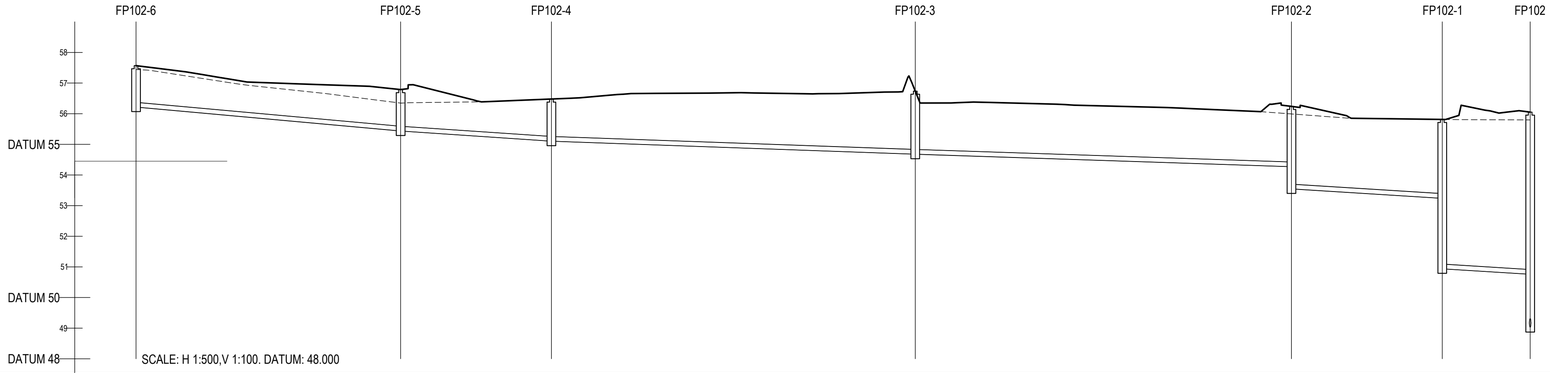
client

KIERAN CURTIN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
PLY	PLY	AS SHOWN	A1

drawing no.: 180221-DBFL-FW-SP-M2-C-3102

revision: P02


FP102-6
FP102-5
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FP102-3
FP102-2
FP102-1
FP102
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DATUM 55
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DATUM 50
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DATUM 48
SCALE: H 1:500,V 1:100. DATUM: 48.000

| | | |

Appendix E : Response To KCC Opinion – Stage 2

Response to Kildare County Council Water Services Department strategic housing development – Pre-Application Consultation Meeting Request Report.

DBFL have liaised with Kildare County Council Water Services department regarding the surface water proposals for the site. In May 2022 DBFL design Engineer (Niall O'Hare) and Kildare County Council Senior Executive Engineer from the Water Services Department (D Hall) met via Microsoft teams to discuss the overall design strategy for the latest layout, in addition to addressing comments from the KCC WSD opinion report outlined below. The below provides a response to the items raised in the report.

Ref	Description	Response
Irish Water Issues (Foul and Water Supply)		
1.1	The IW Confirmation of Feasibility (CoF) ref no CDS21004893 provided by IW to the prospective applicants engineers' dated 170821 (350 units) states it is feasible to facilitate water and wastewater connections for the proposed development subject to upgrades. The water network must be upgraded from 150mm to 200mm diameter for a distance of 400m to increase network capacity. This upgrade is not included in IW current plans and the prospective applicant must engage with IW to progress this upgrade with the prospective applicant providing a contribution of a relevant portion of the upgrade costs. Regarding the wastewater network in which there are significant existing constraints, IW currently has three CIP projects i.e. Drainage Area Plan, Primrose Hill WWPS project and wastewater network extension project which are necessary to facilitate the proposed development. Primrose Hill WWPS and the network extension projects are currently scheduled to be completed in Q4 2023 and 2025, respectively. It is noted from section 4.1 of the submitted Infrastructure Design Report that the prospective applicant has contacted IW about bringing forward the network extension project to match the Primrose Hill WWPS project.	DBFL Consulting Engineers have liaised with Irish Water in relation to detailing timeframes and details of the infrastructure upgrades. Irish Water have advised none of these upgrades require further planning or third party consents.
1.2	Where network connections are required before the completion of these IW projects, which are subject to change, IW are willing to review storm water separation proposals in the Primrose Hill WWPS catchment in order to provide additional network capacity. Any such proposal must also be approved in advance by KCC as the storm drainage authority.	DBFL have advised KCC WSD and Irish Water that the programmes of delivery for both the Primrose Hill WwPS project and the Gravity sewer extension shall tie in

		with the delivery of the development.
1.3	Given the level of ongoing development, extant planning permissions and zoned lands in the area WSD have recommended to IW that hydraulic and condition assessments of local networks be considered in order to identify further constraints and required upgrades which should be delivered by developers where new connections are required to facilitate developments.	No comment
1.4	WSD respectfully suggest that where permission is granted, Irish Water should be added to the standard condition requesting drainage and water supply arrangements to comply with the requirements of the Panning Authority.	No Comment
1.5	Drainage design issues have been forwarded separately to the engineering agent and can be discussed offline.	No comment
1.6	With regard to the above issues the prospective applicant should be advised to continue their ongoing dialogue with IW and consult KCC WSD to maximise certainty on the timelines for any network hydraulic & condition network assessments, upgrades or storm water separation proposals that may be required to be delivered and-or development phasing arrangements so as to align available network capacity with the additional flows generated by the proposed development, before finalising the detailed drainage design, receiving the W Statement of Design Acceptance and submitting any planning application to the Board.	DBFL on behalf of their client are engaged with both Irish Water and KCC WSD to ensure all issues raised within their respective reports are addressed in timely manners ahead of formal submissions. DBFL With with KCC WSD in May 2022 and followed up correspondence with IW
KCC Water Service Issues (Surface Water & Flood Risk) **Surface Water:**		
2.1	The Shinkeen and Hazelhatch stream watercourses and any site and any on-site open drainage channels shall be retained in open channel and any existing site pipework should be 'de-culverted' in order to comply with GDSDS Sustainability Stormwater Drainage Design Principle and to promote biodiversity and provide amenity value for future residents and visitors alike. Maintenance regime for the stream and other open channels shall also be addressed in any planning application;	3nr new vehicular and pedestrian bridges are proposed to gain access to the site. To comply with OPW Section 50 guidelines, watercourse crossings will bed provided with a 300mm freeboard to the 1% AEP + CC flood level
2.2	Section 50 consent shall be obtained from OPW where required for the proposed bridge-culvert crossings of the Shinkeen <2no> and Hazelhatch <1no> stream	S50 consents have been submitted to the OPW for the 3nr bridge crossings.

	watercourses and any other changes thereto e.g. realignment as a result of the proposed development. The OPW consents shall be included in the engineering report submitted with any planning application.	No construction shall take place prior to the OPW S50 consent. The OPW S50 application can only be submitted after grant of approval and will be done so after. To comply with OPW Section 50 guidelines, watercourse crossings will bed provided with a 300mm freeboard to the 1% AEP + CC flood level
2.3	The proposed surface water drainage and SuDS strategy shall comply with the surface water management policies and objectives contained in the relevant Celbridge LAP and CDP <currently under review> and be revised as follows in accordance with the Greater Dublin Strategic Drainage Study (GDSDS).	The Surface Management Strategy and SUDS proposals were discussed in detail with KCC WSD and as described within this Infrastructure Design Report.
2.4	The proportion of impermeable surfaces shall be reduced as much as possible e.g. pervious surfacing can be introduced in all roadways, pavements and footpaths in private areas and management company controlled areas including at the apartment blocks and the childcare facility. It is noted from submitted Infrastructure Design Report <IDR> Table 3.1 that the proportion of on-site impermeable is relatively high at 50%. Rainwater harvesting shall be considered for all management company controlled buildings including the proposed creche and apartment blocks.	The proportion of onsite impermeability has been investigated and has been decreased. There are no apartment blocks proposed or management controlled buildings within the development.
2.5 & 2.6	All remaining impermeable surface areas shall be discharged to at least 1 SuDS feature in the following structured and hierarchial manner. Nature based solutions (NBS) and Natural Water Retention Measures (NWRM) SuDS which reduce and treat runoff shall be prioritised in the first instance green-blue roofs in management company structures) and rain gardens, house planters and which also promote biodiversity in flora and fauna, provide amenity value and assist flood risk management. Furthermore, these types of SuDS promote climate change resilience and reduce the total carbon footprint of the proposed development throughout its whole life cycle including before and after construction. These NBS-NWRM SuDS shall not ordinarily discharge runoff to the drainage pipe network or watercourses except in extreme rainfall events <see item 2.20 below>.	Nature Based Systems shall be maximised in the development as described under points 3.5 & 3.6. These proposals have been discussed in detail with KCC WSD and reference should be made to the Infrastructure design report.

	WSD recommend that the proposed bioswales should be maximised throughout the development and the internal roadways and the link road should discharge runoff directly to the bioswales through gaps in the roadside kerbs without the need for road gulleys Or road drainage pipe network except as SuDS overflow. The proposed underground attenuation storage structures and detention basins <see item 2.12 below> should be replaced with NBS-NWRM SuDS i.e. constructed wetlands, bioretention areas or retention ponds. House roof runoff should primarily discharge to house planters or rain gardens <see item 2.9 below>. The rationale for rain gardens not being provided throughout the proposed development (Only shown in catchment B2 on submitted drainage layout drawings) shall be clarified in any planning application. The planting schemes for BS and NWRM SuDS shall be devised by landscape architects and conform to recommended industry guidance including CIRIA SuDS Manual. WSD consider that NBS-NWRM SuDS provided in open space areas g ponds, bioswales or bioretention areas should count towards the 15% open space requirement.	
2.7	Where BS and NWRM1 SuDS are not included in the proposed drainage-SuDS strategy to be submitted with any planning application, a clear and plausible rationale for this approach must be included in the engineering report submitted with any planning application. Absence of NBS-NWRM SUDS without an acceptable justification will lead to a pre-commencement condition where permission is granted seeking clarification on this absence with potential construction delays and in extreme cases, a recommendation for refusal of the planning application.	As above. No underground tanks (concrete, geocellular or otherwise) are proposed within the development. .
2.8	Only where the run-off from the site impermeable surface areas cannot be discharged to these nature- based SuDS, shall other SuDS types be considered, starting with infiltration system SuDS which discharge runoff to ground. Infiltration system SuDS can be either shallow or deep depending on their invert level and depth of runoff discharge.	OK – no further comment
2.9	Subject to expert geotechnical advice, shallow infiltration SuDS including the proposed driveway and parking bay permeable paving (the value of the proposed infiltration trenches under the car parking permeable paving in	OK – no further comment

	catchment B2 is not readily apparent and shall be reviewed) and additional permeable paving on internal roadways, in management company controlled areas and other private areas and the proposed tree pits (tree trenches involve a larger combination of trees) and can be unlined and along with infiltration SuDS in areas of fill may not be subject to soil infiltration tests and groundwater monitoring due to their location in the unconsolidated soil upper layers*and above typical groundwater levels (subject to check of nearest groundwater level results to ensure they are above maximum recorded groundwater levels) and if the fill material is sufficiently permeable, the fill layer suitably deep and-or the underlying existing ground formation is treated appropriately. "It is vital to ensure that these upper soil layers are not over-compacted during or after the construction stage in locations where shallow infiltration system SuDS are proposed so as to maintain sufficient upper soil layer infiltration values. Expert geotechnical advice shall also be sought on soil replacement-remediation measures where over-compaction of the upper soil layers occurs. House runoff shall discharge to unlined driveway permeable paving and-or garden soakaways where NBS-NWRM SuDS are not feasible. Drainage provision in gardens including any shallow soakaways taking roof runoff and open space areas shall be carefully addressed where over-compaction of the upper soil layers may occur during and after construction phase and have cognisance of high site groundwater levels (see item 2.10 below).	
2.10	Deep infiltration system SuDS such as deep soakaways, proposed infiltration trenches (including underdraining the proposed bioswales where feasible) and unlined underground attenuation storage structures are subject to adequate soil permeability and favourable site groundwater regimes at their location and depth of discharge. Soil permeability shall be assessed by conducting BRE Digest 365 soil infiltration tests and groundwater monitoring at the locations and depths of the proposed deep infiltration SuDS.	The ground site investigation indicated that ground permeability was low within the site. As such deep soakaways are not proposed for the site. Reference should be made to the proposed road levels indicated on the drawings where these have ben kept up to allow for appropriate storage under permeable parking bays and the likes.
2.10.1	A site investigation exercise including soil infiltration tests and groundwater monitoring is currently being carried out	8nr groundwater standpipes were installed.

	and the results shall be submitted with any planning application that may be made.	Reference should be made to the GSI report and section 3.11 of the Infrastructure Design Report.
2.10.2	With regard to the site investigation drawing submitted at ID Appendix B the following amendments are recommended: Trial pit and infiltration test at road side swale at manhole S02B-7, attenuation storage S07B-1 trial pit at detention basin S04B-1, infiltration test and trial pit at swale SO1B, trial pit at attenuation storage SO1D-2-1, infiltration test and trial pit at infiltration trench S10D and infiltration test at S03D-1 and Deeper percussion boreholes should be considered at the trial pit-infiltration test locations on the submitted drawing and as item 2.10.2.1 above especially where no permeable sub-soils are encountered in the shallower trial pits and-or the infiltration tests fail and to facilitate standpipe installation and groundwater monitoring at these locations.	Trial pit and Infiltration tests at road side swales will be reviewed along with depths of Boreholes to ensure the necessary information is retrieved to aid the design.
2.10.3	Groundwater monitoring shall be carried out at the trial pit-infiltration test locations on the submitted drawing and as item 2.10.2,1 above, last at least 6 months and include at least one winter season. As monitoring may not be completed by the time the proposed development starts, the prospective applicant shall indicate in any planning application whether they are prepared to accept a condition should permission be granted to the effect that no development shall commence until such time as the groundwater monitoring has been completed, analysed and the infiltration SuDS strategy and design finalised.	Groundwater Monditioring has been undertaken from January until May 2022. We shall accept a condition if further groundwater monitoring is required. Reference should be made to GW monitoring logs within the Ground Site Investigation and Section 3.11 of the Infrastructure Design Report.
2.10.4	Discharge from infiltration system SuDS should be located a safe distance from buildings, structures and roads to prevent damage to sub-structures or their foundation layers shall be lined-tanked.	Ok – No further comment
2.10.5	A drainage layout drawing with the various infiltration test and groundwater monitoring locations and results is a useful tool in optimising the SuDS strategy and should be included in any planning application submission.	Please refer to drawing 180221-DBFL-EW-SP-DR-C-9050- Site Investigation illustrating same.
2.10.6	Expert geotechnical and hydrogeological advice shall be sought prior to finalisation of the infiltration SuDS strategy.	McCloys Consulting Engineers who are specialist in Flood Modelling have been appointed to provide

		expert advice in relation to hydrogeological and IGSL have been provided expert geotechnical advice.
2.11	Where infiltration system SuDS are not feasible and as item 2.7 above, only then shall filtration system SuDS such as lined permeable paving and the proposed filter drains-strips (which are typically narrow and linear so are suitable where space is restricted e.g. along roads) be considered in the drainage and SuDS strategies.	Ok – No further Comment
2.12	Finally, detention system SuDS i.e. detention basins, rainwater butts and lined underground attenuation storage structures such as the proposed large structures should only be considered as a last resort where the other SuDS types are not deemed feasible and as item 2.7 above.	Ok – No further comment
2.13	The Shinkeen (which has a deep channel) and Hazelhatch streams and other site open channel drains- ditches and all SuDS surface storage areas for runoff including large link road swale shall be subject to a risk assessment. The Shinkeen may be part of a OPW Arterial Drainage Scheme and maintained by the OPW, so they should be contacted.	It is not anticipated to disturb the slopes or banks or levels of either streams. The riparian strip will be designed by Landscape architects in a way to minimise active movements within.
2.14	NB the environmental implications of discharging surface water to ground and to the Shinkeen and Hazelhatch streams where unavoidable e.g. for SuDS overflows and which are tributaries to the river Liffey shall be adequately assessed. Waterways Ireland and Inland Fisheries Ireland shall be consulted.	OK – No further comment
2.15	The drainage and SuDS strategy should feature input from Roads, Development Control and Parks departments. The separation of link road drainage, residential drainage to be put forward for taking in charge and management company controlled drainage shall be assessed in this regard.	Ok - No further comment
2.16.1	The following details of the receiving Shinkeen and Hazelhatch streams to which runoff from the proposed development may need to be discharged shall be submitted with any planning applications: Consent from the relevant statutory agency for the applicant to discharge runoff to the watercourses and construct headwalls thereon, and	Ok – No further comment

2.16.2	Capacity assessment of watercourses to adequately cater for existing flows therein and the restricted discharge from the proposed development. Bearing in mind the watercourses may be accepting more runoff from the site post-development and	McCloys Consulting Engineers have been appointed as experts and hydraulic assessments for the watercourses with regards to the proposed development
2.16.3	Condition assessment of the watercourses which identifies any faults therein and which must be remedied to accept runoff from the development,	Ok – No further comment
2.16.4	Remedial measures to the watercourses to provide required capacity including timeframe for delivery thereof	Ok – No further comment
2.16.5	Maintenance arrangements including responsibility to ensure capacity is retained.	Ok – No further comment
2.17	Drainage design issues have been forwarded separately to the engineering agent.	Ok – No further comment
Flood Risk		
2.18	The site specific flood risk assessment (SSFRA) submitted with any planning application should be in accordance with the 'Flood Risk Management guidelines for use in the Planning System', the flood risk management policies and objectives contained in the applicable Celbridge LAP and CDP and make appropriate allowance for the effects of future climate change on all relevant flood sources, not just pluvial as in submitted SSFRA. OPW floodinfo website includes medium future scenario fluvial flood mapping with a 20% climate change factor. It is a reasonable assumption that flood risk associated with groundwater will rise as sea levels rise. In SSFRA, all drainage top water levels shall be subject to a 20% climate change factor when assessing minimum 500mm freeboard provision to finished floor levels and any basement-undercroft access ramps, wall openings, vents etc.	McCloy's Consulting Engineers have been appointed as specialists in Hydrological Modelling and undertaking Site Specific Flood Risk Reports. Reference should be make to the site specific flood risk report that has been prepared as part of this assessment.
2.19	The OPW CRAMS fluvial flood mapping for the subject site area has been revised and should be used for the SSFRA to be submitted with any planning application, The O.1 and 1% AEP flood levels have increased for the nearest nodes on Shinkeen and Hazelhatch watercourses. Link for the revised fluvial flood mapping for the subject site: https://kildare.ie/CountyCouncil/YourCouncil/Publications/Environment/HazelhatchFloodReliefScheme/MappingExtentsJan2021/HazelhatchCurrentEx15.pdf	Ok – No further comment
2.20	Finished floor levels and any basement-undercroft access ramps, wall openings, vents etc. levels shall be a minimum	Ok – No further comment

	of 500mm above climate change adjusted reference flood levels and a minimum of 150mm above adjoining ground and road levels.	
2.21	It shall be clearly demonstrated that the proposed development does not create a new or increase an existing flood risk to the adjacent properties and roads including Dublin road, Shinkeen road and the new link road between these roads.	McCloys Consulting have been appointed as flood modelling experts and shall undertake simulations demonstrating the proposed development does not create a new or increased to existing flood risk to the adjacent properties or roads.
2.22	Where any existing on-site fluvial flood storage is lost as a result of the proposed development including by raising site levels and construction of the proposed watercourse crossings, an equal amount of compensatory food storage shall be provided on-site and which is hydraulically connected to the lost storage.	Ok – No further comment
2.23	WSD respectfully suggest that where permission is granted that Mood risk management' should be added to the standard condition requesting drainage arrangements to comply with the requirements of the Planning Authority.	No comment
2.24	Technical design issues relating to pluvial, groundwater and residual flood risk and new IF riparian buffer zone guidelines have been forwarded directly to the prospective applicant under separate cover.	Ok – No further comment
2.25	The prospective applicant should have regard to pre-planning meeting details, previous planning decisions and IW and WSD reports on the subject site and adjacent sites.	DBFL shall engage with IW and WSD on the proposed development with regards to infrastructure requirements for the development.
2.26	WSD remain available for further technical consultations with the applicant-agent.	As 2.25 above.

Appendix F : Storm Calculations

PROJECT		JOB REF.
Ballyoulster - Phase 1 Residential Development Celbridge, Co. Kildare		180221
SUBJECT		**Calc. Sheet No.**
Surface Water Calculations - Permissible Site Discharge		1
Drawing ref.	**Calculations by Checked by**	**Date**
180221-INFO1	PLY	13/06/2022

PERMISSIBLE SURFACE WATER DISCHARGE CALCULATIONS

Site Area

What is the positively drained site area? **12.74** Hectares (ha) Site is Less than 50 Hectares

Pre-Development Catchment Soil Characteristics

Are there different soil types present on the pre-developed site? No

Catchment (This refers to the entire site area)	1	
Area	12.74	Hectares (ha)
Drainage Group	2	Class
Depth to Impermeable Layers	2	Class
Permeability Group above Impermeable Layers	1	Class
Slope (°)	1	Class
SOIL Type	2	From FSR Table
[1]SOIL Index	0.30	

SOIL	SOIL Value	SPR
1	0.15	0.10
2	0.30	0.30
3	0.40	0.37
4	0.45	0.47
5	0.50	0.53

Site SOIL Index Value **0.30**

Site SPR Value **0.30**

Post-Development Catchment Characteristics

Is the development divided into sub-catchments? No

What is the overall positively drained area for catchment? 12.74 Hectares (ha)

Catchment 1	Area (m^2)	Runoff Coeff.	Effective Area (m^2)
Roofs - Type 1 (Draining to gullies)	11350	0.95	10783
Roofs - Type 2 (Draining to SUDS features)	12200	0.55	6710
Green Roofs	0	0.55	0
Roads and Footpaths - Type 1 (Draining to gullies)	33850	0.95	32158
Roads and Footpaths - Type 2 (Draining to Suds features)	12836	0.55	7060
Podium (Intensive Roofs 6-10cm depth)	0	0.83	0
Permeable Paving	7000	0.55	3850
Grassed Areas	50164	0.55	27590
Public Open Space	0	0.30	0

Include Public Open Space in Effective Catchment Area? No Assumed open space area does not drain to surface water network

Effective Catchment Area **88150.0** m^2

Effective Catchment Runoff Coefficient **0.69**

Long-Term Storage

Is long-term Storage provided? No

Permissible Site Discharge

What is the Standard Average Annual Rainfall (SAAR)? 750.0 mm From Met Eireann, Co-ordinates 298355,233018

Is the overall site area less than 50 hectares? Yes

[5]$QBAR_{Rural}$ calculated for 50 ha and linearly interpolated for area of site 28.02 Litres/sec

[7]Site Discharge = **28.02** Litres/sec

Notes and Formulae

1. SOIL index value calculated from Flood Studies Report - The Classification of Soils from Winter Rainfall Acceptance Rate (Table 4.5).
2. SPR value calculated from GDSDS - Table 6.7.
3. Rainfall depth for 100 year return period, 6 hour duration with additional 10% for climate change.
4. Long-term storage Vol_{xs} (m^3) = Rainfall.Area.10.[(PIMP/100)(0.8.α)+(1-PIMP/100)(β.SPR)-SPR]. (GDSDS Section 6.7.3).
   Where long-term storage cannot be provided on-site due to ground conditions, Total Permissible Outflow is to be kept to $QBAR_{(Rural)}$.
5. Total Permissible Outflow - $QBAR_{(Rural)}$ calculated in accordance with GDSDS - Regional Drainage Policies
   (Volume 2 - Chapter 6), i.e. $QBAR(m3/s)=0.00108x(Area)^{0.89}(SAAR)^{1.17}(SOIL)^{2.17}$ - For catchments greater than 50 hectares in area. Flow rates are linearly interpolated for areas samller than 50hectares.
6. Where Total Permissible Outflow is less than 2.0l/s and not achievable, use 2.0 l/s or closest value possible.
7. QBAR multiplied by growth factors of 0.85 for 1 year, 2.1 for 30 year and 2.6 for 100 year return period events, from GDSDS Figure C2.

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 298355, Northing: 233018,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.3,	3.4,	4.0,	4.9,	5.6,	6.1,	7.8,	9.8,	11.2,	13.1,	14.9,	16.3,	18.5,	20.2,	21.7,	N/A ,
10 mins	3.2,	4.7,	5.5,	6.9,	7.8,	8.5,	10.9,	13.7,	15.6,	18.3,	20.8,	22.7,	25.8,	28.2,	30.2,	N/A ,
15 mins	3.7,	5.5,	6.5,	8.1,	9.1,	10.0,	12.8,	16.1,	18.3,	21.5,	24.5,	26.7,	30.3,	33.1,	35.5,	N/A ,
30 mins	4.9,	7.2,	8.5,	10.4,	11.7,	12.8,	16.2,	20.3,	23.0,	26.8,	30.3,	33.1,	37.3,	40.7,	43.5,	N/A ,
1 hours	6.5,	9.4,	11.0,	13.4,	15.0,	16.3,	20.6,	25.5,	28.8,	33.4,	37.6,	40.9,	45.9,	49.9,	53.2,	N/A ,
2 hours	8.6,	12.2,	14.2,	17.2,	19.3,	20.8,	26.1,	32.0,	36.0,	41.6,	46.6,	50.5,	56.6,	61.3,	65.2,	N/A ,
3 hours	10.1,	14.3,	16.5,	20.0,	22.3,	24.1,	29.9,	36.6,	41.1,	47.3,	52.9,	57.2,	63.9,	69.1,	73.4,	N/A ,
4 hours	11.3,	16.0,	18.4,	22.2,	24.7,	26.6,	33.0,	40.3,	45.1,	51.8,	57.8,	62.5,	69.6,	75.2,	79.8,	N/A ,
6 hours	13.3,	18.6,	21.5,	25.7,	28.5,	30.8,	38.0,	46.1,	51.4,	58.9,	65.6,	70.7,	78.6,	84.8,	89.8,	N/A ,
9 hours	15.7,	21.8,	25.0,	29.8,	33.0,	35.5,	43.6,	52.7,	58.7,	67.0,	74.4,	80.1,	88.8,	95.6,	101.2,	N/A ,
12 hours	17.6,	24.3,	27.8,	33.1,	36.6,	39.3,	48.1,	58.0,	64.4,	73.4,	81.3,	87.4,	96.8,	104.0,	110.0,	N/A ,
18 hours	20.8,	28.4,	32.4,	38.3,	42.3,	45.4,	55.3,	66.3,	73.5,	83.4,	92.2,	99.0,	109.3,	117.3,	123.9,	N/A ,
24 hours	23.3,	31.7,	36.1,	42.6,	46.9,	50.3,	61.0,	72.9,	80.6,	91.4,	100.8,	108.1,	119.2,	127.7,	134.7,	159.0,
2 days	29.2,	38.6,	43.5,	50.6,	55.2,	58.8,	70.1,	82.5,	90.4,	101.3,	110.8,	118.1,	129.1,	137.4,	144.3,	167.9,
3 days	34.0,	44.3,	49.5,	57.1,	62.0,	65.8,	77.7,	90.6,	98.8,	110.0,	119.7,	127.0,	138.1,	146.6,	153.5,	177.0,
4 days	38.3,	49.3,	54.8,	62.8,	68.0,	72.0,	84.4,	97.7,	106.2,	117.7,	127.6,	135.1,	146.3,	154.9,	161.8,	185.5,
6 days	45.8,	58.1,	64.2,	72.9,	78.5,	82.8,	96.1,	110.2,	119.1,	131.2,	141.5,	149.2,	160.9,	169.7,	176.8,	200.9,
8 days	52.6,	65.8,	72.4,	81.8,	87.8,	92.3,	106.3,	121.2,	130.5,	143.0,	153.7,	161.7,	173.7,	182.7,	190.0,	214.6,
10 days	58.8,	73.0,	80.0,	89.9,	96.2,	101.0,	115.7,	131.2,	140.8,	153.8,	164.8,	173.1,	185.4,	194.6,	202.1,	227.1,
12 days	64.6,	79.7,	87.0,	97.4,	104.0,	109.0,	124.4,	140.4,	150.4,	163.8,	175.1,	183.6,	196.2,	205.6,	213.2,	238.7,
16 days	75.6,	92.1,	100.1,	111.4,	118.5,	123.9,	140.3,	157.4,	167.9,	182.0,	193.9,	202.8,	215.9,	225.7,	233.6,	259.9,
20 days	85.8,	103.6,	112.2,	124.2,	131.9,	137.5,	154.9,	172.9,	183.9,	198.6,	211.0,	220.2,	233.8,	244.0,	252.1,	279.2,
25 days	97.8,	117.1,	126.4,	139.3,	147.4,	153.4,	171.8,	190.8,	202.4,	217.8,	230.7,	240.3,	254.4,	264.9,	273.4,	301.3,

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

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.850	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for SW_1

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	14.288	0.193	74.0	0.032	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	60.838	0.365	166.7	0.076	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.000	10.337	0.330	31.3	0.101	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	7.384	0.076	97.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	10.908	0.078	139.8	0.044	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	24.200	0.142	170.4	0.035	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	100.00	5.16	53.966	0.032	0.0	0.0	1.9	1.52	60.5	11.7
S2.000	100.00	6.00	54.484	0.076	0.0	0.0	4.6	1.01	40.2	27.8
S3.000	100.00	5.07	54.450	0.101	0.0	0.0	6.2	2.35	93.3	37.2
S2.001	100.00	6.08	54.044	0.176	0.0	0.0	10.8	1.60	112.8	65.0
S1.001	100.00	6.22	53.698	0.252	0.0	0.0	15.5	1.33	93.8	92.9
S4.000	100.00	5.40	54.267	0.035	0.0	0.0	2.1	1.00	39.7	12.8

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Network Design Table for SW_1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.001	28.946	0.121	239.2	0.153	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.002	38.228	0.159	240.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	28.203	0.108	260.0	0.099	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	14.925	0.057	260.0	0.006	0.00	0.0	0.600	o	450	Pipe/Conduit	
S5.000	25.888	0.336	77.0	0.074	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	14.422	0.087	165.8	0.023	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	37.286	0.107	348.5	0.022	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.004	5.023	0.013	400.0	0.019	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	10.291	0.103	99.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.001	100.00	5.88	54.050	0.188	0.0	0.0	11.5	1.01	71.5	69.2
S4.002	100.00	6.51	53.929	0.188	0.0	0.0	11.5	1.01	71.4	69.2
S1.002	99.64	6.89	53.620	0.539	0.0	0.0	33.0	1.26	199.8	198.0
S1.003	98.59	7.08	53.512	0.545	0.0	0.0	33.0	1.26	199.8	198.0
S5.000	100.00	5.29	54.123	0.074	0.0	0.0	4.5	1.49	59.3	27.2
S6.000	100.00	5.24	53.874	0.023	0.0	0.0	1.4	1.01	40.3	8.6
S5.001	100.00	5.86	53.562	0.120	0.0	0.0	7.3	1.08	172.3	44.1
S1.004	98.16	7.17	53.455	0.684	0.0	0.0	41.2	1.01	160.7«	247.2
S1.005	97.49	7.30	53.442	0.684	0.0	0.0	41.2	1.31	52.0«	247.2

Free Flowing Outfall Details for SW_1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	SS00A	54.810	53.339	53.400	0	0

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Online Controls for SW_1

Hydro-Brake® Optimum Manhole: SS02A-ATN, DS/PN: S1.004, Volume (m³): 10.2

Unit Reference	MD-SHE-0067-2500-1645-2500
Design Head (m)	1.645
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	53.455
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.645	2.5
Flush-Flo™	0.294	2.0
Kick-Flo®	0.600	1.6
Mean Flow over Head Range	-	1.9

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	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	2.0	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Storage Structures for SW_1

Tank or Pond Manhole: SS02A-ATN, DS/PN: S1.004

Invert Level (m) 53.455

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.6	0.500	2.6	1.000	2.6	1.500	794.2
0.100	2.6	0.600	2.6	1.100	607.0	1.600	844.9
0.200	2.6	0.700	2.6	1.200	651.4	1.645	868.3
0.300	2.6	0.800	2.6	1.300	697.4		
0.400	2.6	0.900	2.6	1.400	745.0		

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Summary of Critical Results by Maximum Level (Rank 1) for SW_1

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS06A	120 Winter	100	+20%	1/15 Summer			
S2.000	SS05A-3	15 Winter	100	+20%	5/30 Winter			
S3.000	SS05A-1-1-ATN	15 Winter	100	+20%	5/30 Winter			
S2.001	SS05A-1	15 Winter	100	+20%	1/30 Summer			
S1.001	SS05A	240 Winter	100	+20%	1/15 Summer			
S4.000	SS04A-3	30 Summer	100	+20%	1/30 Winter			
S4.001	SS04A-2	30 Summer	100	+20%	1/30 Summer			
S4.002	SS04A-1	240 Winter	100	+20%	1/15 Winter			
S1.002	SS04A	240 Winter	100	+20%	1/15 Summer			
S1.003	SS03A	360 Winter	100	+20%	1/15 Summer			
S5.000	SS02A-2	360 Winter	100	+20%	1/30 Summer			
S6.000	SS02A-1-1	360 Winter	100	+20%	1/15 Summer			
S5.001	SS02A-1	360 Winter	100	+20%	1/15 Summer			
S1.004	SS02A-ATN	360 Winter	100	+20%	1/15 Summer			
S1.005	SS01A-HB	360 Winter	100	+20%				

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Summary of Critical Results by Maximum Level (Rank 1) for SW_1

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SS06A	55.025	0.834	0.000	0.08			4.3
S2.000	SS05A-3	55.222	0.513	0.000	0.65			25.3
S3.000	SS05A-1-1-ATN	55.197	0.522	0.000	0.51			39.7
S2.001	SS05A-1	55.077	0.733	0.000	0.92			63.5
S1.001	SS05A	55.021	1.023	0.000	0.30			20.8
S4.000	SS04A-3	55.079	0.587	0.000	0.33			12.1
S4.001	SS04A-2	55.053	0.703	0.000	0.96			62.4
S4.002	SS04A-1	55.024	0.795	0.000	0.24			16.1
S1.002	SS04A	55.012	0.942	0.000	0.27			45.5
S1.003	SS03A	54.946	0.984	0.000	0.23			35.3
S5.000	SS02A-2	54.946	0.598	0.000	0.09			4.8
S6.000	SS02A-1-1	54.945	0.846	0.000	0.04			1.5
S5.001	SS02A-1	54.945	0.933	0.000	0.05			7.7
S1.004	SS02A-ATN	54.945	1.040	0.000	0.02			2.4
S1.005	SS01A-HB	53.476	-0.191	0.000	0.05			2.4

PN	US/MH Name	Status	Level Exceeded
S1.000	SS06A	SURCHARGED	
S2.000	SS05A-3	SURCHARGED	
S3.000	SS05A-1-1-ATN	SURCHARGED	
S2.001	SS05A-1	SURCHARGED	
S1.001	SS05A	SURCHARGED	
S4.000	SS04A-3	SURCHARGED	
S4.001	SS04A-2	SURCHARGED	
S4.002	SS04A-1	SURCHARGED	
S1.002	SS04A	FLOOD RISK	
S1.003	SS03A	FLOOD RISK	
S5.000	SS02A-2	SURCHARGED	
S6.000	SS02A-1-1	FLOOD RISK	
S5.001	SS02A-1	SURCHARGED	
S1.004	SS02A-ATN	FLOOD RISK	
S1.005	SS01A-HB	OK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.850	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for SW_2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	41.764	0.274	152.4	0.078	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	55.601	0.291	191.1	0.162	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	26.261	0.066	397.9	0.123	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.002	38.345	0.096	399.4	0.070	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	53.551	0.490	109.3	0.131	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	67.825	0.172	394.3	0.106	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	100.00	5.66	54.473	0.078	0.0	0.0	4.8	1.06	42.0	28.6
S2.000	100.00	5.82	54.415	0.162	0.0	0.0	9.9	1.13	80.2	59.6
S1.001	100.00	6.25	53.974	0.363	0.0	0.0	22.3	1.01	161.1	133.7
S1.002	99.66	6.88	53.908	0.433	0.0	0.0	26.5	1.01	160.8	158.8
S3.000	100.00	5.71	54.527	0.131	0.0	0.0	8.1	1.25	49.7	48.4
S1.003	94.99	7.81	53.662	0.670	0.0	0.0	39.0	1.22	345.0	234.3

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Network Design Table for SW_2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.000	44.080	0.304	145.0	0.065	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	7.791	0.048	162.3	0.045	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	11.747	0.023	510.7	0.082	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	14.553	0.032	454.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.000	50.429	0.210	240.1	0.095	5.00	0.0	0.600	o	300	Pipe/Conduit	
S5.001	9.463	0.039	242.6	0.047	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	59.767	0.247	242.0	0.141	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.001	60.588	0.252	240.4	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.000	23.754	0.396	60.0	0.134	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	17.657	0.106	166.6	0.059	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.002	91.076	0.294	309.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.006	9.837	0.018	546.5	0.055	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	87.377	0.364	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	12.804	0.053	241.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.000	100.00	5.68	54.217	0.065	0.0	0.0	4.0	1.08	43.1	24.1
S4.001	100.00	5.80	53.913	0.111	0.0	0.0	6.8	1.02	40.7«	40.8
S1.004	94.14	7.99	53.490	0.862	0.0	0.0	49.8	1.07	302.7	298.9
S1.005	93.16	8.20	53.467	0.862	0.0	0.0	49.8	1.14	321.0	298.9
S5.000	100.00	5.83	54.278	0.095	0.0	0.0	5.8	1.01	71.4	35.0
S5.001	100.00	5.99	54.068	0.142	0.0	0.0	8.7	1.00	71.0	52.1
S6.000	100.00	5.99	54.634	0.141	0.0	0.0	8.6	1.01	71.1	51.8
S6.001	99.08	6.99	54.387	0.201	0.0	0.0	12.2	1.01	71.4«	73.3
S7.000	100.00	5.23	55.570	0.134	0.0	0.0	8.3	1.69	67.3	49.5
S6.002	97.99	7.20	54.060	0.395	0.0	0.0	23.7	1.40	154.7	142.5
S5.002	91.76	8.52	53.879	0.536	0.0	0.0	30.2	1.15	182.9	181.2
S1.006	91.08	8.68	53.435	1.453	0.0	0.0	81.3	1.03	292.5«	487.5
S1.007	85.41	10.12	53.417	1.453	0.0	0.0	81.3	1.01	71.4«	487.5
S1.008	84.65	10.33	53.053	1.453	0.0	0.0	81.3	1.01	71.2«	487.5

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Free Flowing Outfall Details for SW_2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.008	SS00B	54.500	53.000	53.000	1200	0

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Online Controls for SW_2

Hydro-Brake® Optimum Manhole: SS02.1B-ATN1, DS/PN: S1.006, Volume (m³): 21.5

Unit Reference	MD-SHE-0121-8200-1800-8200
Design Head (m)	1.800
Design Flow (l/s)	8.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	121
Invert Level (m)	53.435
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	8.2
Flush-Flo™	0.532	8.1
Kick-Flo®	1.084	6.5
Mean Flow over Head Range	-	7.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.3	1.200	6.8	3.000	10.4	7.000	15.6
0.200	7.0	1.400	7.3	3.500	11.2	7.500	16.1
0.300	7.7	1.600	7.8	4.000	11.9	8.000	16.6
0.400	8.0	1.800	8.2	4.500	12.6	8.500	17.1
0.500	8.1	2.000	8.6	5.000	13.3	9.000	17.6
0.600	8.1	2.200	9.0	5.500	13.9	9.500	18.1
0.800	7.8	2.400	9.4	6.000	14.5		
1.000	7.1	2.600	9.7	6.500	15.1		

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Storage Structures for SW_2

Tank or Pond Manhole: SS02B-1-2-ATN2, DS/PN: S7.000

Invert Level (m) 55.580

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	281.2	0.200	343.8	0.400	412.7
0.100	311.7	0.300	377.4		

Tank or Pond Manhole: SS02.1B-ATN1, DS/PN: S1.006

Invert Level (m) 53.435

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.6	0.600	2.5	1.200	2.5	1.800	2335.9
0.100	2.5	0.700	2.5	1.300	2.5	1.900	2422.4
0.200	2.5	0.800	2.5	1.400	2005.8	2.000	2510.4
0.300	2.5	0.900	2.5	1.500	2086.0	2.019	2527.3
0.400	2.5	1.000	2.5	1.600	2167.7		
0.500	2.5	1.100	2.5	1.700	2251.0		

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Summary of Critical Results by Maximum Level (Rank 1) for SW_2

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.000	SS08B	15 Winter	100	+20%	1/60 Winter		
S2.000	SS07B-1	15 Winter	100	+20%	1/60 Winter		
S1.001	SS07B	15 Winter	100	+20%	1/30 Winter		
S1.002	SS06B	15 Winter	100	+20%	1/30 Winter		
S3.000	SS05B-1	15 Winter	100	+20%	1/60 Winter		
S1.003	SS05B	360 Winter	100	+20%	1/30 Summer		
S4.000	SS04B-3	15 Winter	100	+20%	1/30 Winter		
S4.001	SS04B-2	360 Winter	100	+20%	1/15 Summer		
S1.004	SS04B	360 Winter	100	+20%	1/15 Summer		
S1.005	SS03B	360 Winter	100	+20%	1/15 Summer		
S5.000	SS02B-3	30 Winter	100	+20%	1/60 Winter		
S5.001	SS02B-2	240 Winter	100	+20%	1/30 Winter		
S6.000	SS02B-1-3	15 Winter	100	+20%	30/15 Winter		
S6.001	SS02B-1-2	15 Summer	100	+20%	1/60 Winter		
S7.000	SS02B-1-2-ATN2	60 Winter	100	+20%			
S6.002	SS02B-1-1	180 Winter	100	+20%	1/30 Winter		
S5.002	SS02B-1	240 Winter	100	+20%	1/30 Summer		
S1.006	SS02.1B-ATN1	360 Winter	100	+20%	1/15 Summer		
S1.007	SS02B-HB	10080 Summer	100	+20%			
S1.008	SS01B	10080 Summer	100	+20%			

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Summary of Critical Results by Maximum Level (Rank 1) for SW_2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SS08B		55.229	0.531	0.000	0.64			25.5
S2.000	SS07B-1		55.276	0.561	0.000	0.69			52.7
S1.001	SS07B		55.108	0.684	0.000	0.77			105.4
S1.002	SS06B		55.088	0.730	0.000	0.82			116.8
S3.000	SS05B-1		55.324	0.572	0.000	0.89			42.3
S1.003	SS05B		55.066	0.804	0.000	0.14			44.1
S4.000	SS04B-3		55.076	0.634	0.000	0.51			21.0
S4.001	SS04B-2		55.066	0.928	0.000	0.24			7.3
S1.004	SS04B		55.065	0.975	0.000	0.37			56.7
S1.005	SS03B		55.064	0.997	0.000	0.31			56.6
S5.000	SS02B-3		55.128	0.550	0.000	0.41			27.7
S5.001	SS02B-2		55.094	0.726	0.000	0.22			12.3
S6.000	SS02B-1-3		55.392	0.458	0.000	0.71			48.0
S6.001	SS02B-1-2		55.280	0.593	0.000	0.77			52.6
S7.000	SS02B-1-2-ATN2		55.651	-0.144	0.000	0.28			17.2
S6.002	SS02B-1-1		55.168	0.733	0.000	0.30			38.4
S5.002	SS02B-1		55.090	0.761	0.000	0.26			44.4
S1.006	SS02.1B-ATN1		55.063	1.028	0.000	0.05			8.1
S1.007	SS02B-HB		53.485	-0.232	0.000	0.12			8.1
S1.008	SS01B		53.127	-0.226	0.000	0.14			8.1

PN	US/MH Name	Status	Level Exceeded
S1.000	SS08B	SURCHARGED	
S2.000	SS07B-1	SURCHARGED	
S1.001	SS07B	SURCHARGED	
S1.002	SS06B	SURCHARGED	
S3.000	SS05B-1	SURCHARGED	
S1.003	SS05B	SURCHARGED	
S4.000	SS04B-3	SURCHARGED	
S4.001	SS04B-2	FLOOD RISK	
S1.004	SS04B	FLOOD RISK	
S1.005	SS03B	SURCHARGED	
S5.000	SS02B-3	SURCHARGED	
S5.001	SS02B-2	SURCHARGED	
S6.000	SS02B-1-3	SURCHARGED	
S6.001	SS02B-1-2	SURCHARGED	
S7.000	SS02B-1-2-ATN2	OK	
S6.002	SS02B-1-1	SURCHARGED	
S5.002	SS02B-1	SURCHARGED	
S1.006	SS02.1B-ATN1	SURCHARGED	
S1.007	SS02B-HB	OK	
S1.008	SS01B	OK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.850	Min Slope for Optimisation (1:X)	600

Designed with Level Soffits

Network Design Table for SW_3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	19.770	0.247	80.0	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	22.385	1.119	20.0	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	43.202	0.259	166.8	0.058	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	56.534	0.523	108.1	0.077	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.002	56.534	0.269	210.0	0.076	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	56.927	0.139	410.0	0.093	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	35.285	0.181	194.9	0.087	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	57.442	0.287	200.1	0.123	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	100.00	5.23	55.869	0.045	0.0	0.0	2.7	1.46	58.2	16.5
S1.001	100.00	5.35	55.622	0.083	0.0	0.0	5.1	2.94	116.9	30.6
S2.000	100.00	5.71	55.207	0.058	0.0	0.0	3.6	1.01	40.1	21.5
S2.001	100.00	6.46	54.948	0.136	0.0	0.0	8.3	1.26	50.0	49.9
S2.002	97.31	7.33	54.350	0.212	0.0	0.0	12.6	1.08	76.4	75.9
S1.002	92.80	8.29	53.931	0.388	0.0	0.0	22.1	1.00	158.7	132.5
S3.000	100.00	5.63	55.075	0.087	0.0	0.0	5.3	0.93	37.1	32.0
S3.001	100.00	6.49	54.819	0.210	0.0	0.0	12.9	1.11	78.3	77.2

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Network Design Table for SW_3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.002	57.442	0.590	97.4	0.142	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	43.755	0.327	134.0	0.092	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.000	17.848	0.105	170.0	0.029	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	25.517	0.051	500.3	0.054	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.000	18.045	0.108	167.1	0.061	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	19.037	0.398	47.8	0.086	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	12.729	0.636	20.0	0.061	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	37.585	0.268	140.0	0.042	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.002	20.268	0.135	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	26.336	0.066	399.0	0.055	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.006	25.115	0.063	398.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S7.000	69.801	1.482	47.1	0.044	5.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	29.010	0.431	67.3	0.060	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	11.556	0.077	150.1	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.002	99.24	6.96	54.382	0.352	0.0	0.0	21.4	2.06	327.7	128.5
S1.003	90.98	8.70	53.792	0.831	0.0	0.0	46.4	1.75	279.1	278.6
S4.000	100.00	5.30	54.099	0.029	0.0	0.0	1.8	1.00	39.8	10.7
S1.004	89.35	9.09	53.348	0.914	0.0	0.0	50.1	1.08	305.9	300.8
S5.000	100.00	5.30	54.084	0.061	0.0	0.0	3.7	1.01	40.1	22.5
S6.000	100.00	5.17	55.190	0.086	0.0	0.0	5.3	1.90	75.4	31.5
S6.001	100.00	5.24	54.792	0.146	0.0	0.0	9.0	2.94	116.9	53.9
S5.001	100.00	5.77	53.901	0.250	0.0	0.0	15.3	1.33	93.8	92.0
S5.002	100.00	6.03	53.633	0.250	0.0	0.0	15.3	1.28	90.6«	92.0
S1.005	87.91	9.46	53.297	1.219	0.0	0.0	65.8	1.21	342.9«	394.7
S1.006	86.59	9.80	53.231	1.219	0.0	0.0	65.8	1.21	343.1«	394.7
S7.000	100.00	5.61	55.533	0.044	0.0	0.0	2.7	1.91	76.0	16.1
S7.001	100.00	5.91	54.051	0.104	0.0	0.0	6.4	1.60	63.5	38.3
S7.002	100.00	6.09	53.620	0.119	0.0	0.0	7.3	1.06	42.3«	43.7

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Network Design Table for SW_3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.007	2.382	0.005	476.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.008	5.150	0.026	198.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	5.150	0.037	139.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.007	86.45	9.84	53.168	1.338	0.0	0.0	71.0	1.11	313.6«	426.0
S1.008	86.11	9.93	53.163	1.338	0.0	0.0	71.0	0.93	36.8«	426.0
S1.009	85.82	10.01	53.137	1.338	0.0	0.0	71.0	1.11	44.0«	426.0

Free Flowing Outfall Details for SW_3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.009	SS00C	54.572	53.100	0.000	1200	0

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Online Controls for SW_3

Hydro-Brake® Optimum Manhole: SS03C-HB, DS/PN: S1.007, Volume (m³): 10.3

Unit Reference	MD-SHE-0105-6000-1700-6000
Design Head (m)	1.700
Design Flow (l/s)	6.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	105
Invert Level (m)	53.168
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	6.0
Flush-Flo™	0.459	5.7
Kick-Flo®	0.932	4.5
Mean Flow over Head Range	-	5.1

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	3.5	1.200	5.1	3.000	7.8	7.000	11.7
0.200	5.1	1.400	5.5	3.500	8.4	7.500	12.1
0.300	5.5	1.600	5.8	4.000	9.0	8.000	12.5
0.400	5.7	1.800	6.2	4.500	9.5	8.500	12.8
0.500	5.7	2.000	6.5	5.000	10.0	9.000	13.2
0.600	5.6	2.200	6.8	5.500	10.4	9.500	13.5
0.800	5.2	2.400	7.0	6.000	10.9		
1.000	4.7	2.600	7.3	6.500	11.3		

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Storage Structures for SW_3

Tank or Pond Manhole: SS03C-HB, DS/PN: S1.007

Invert Level (m) 53.168

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.500	2.5	1.000	1247.7	1.500	1580.4
0.100	2.5	0.600	2.5	1.100	1311.1	1.528	1600.2
0.200	2.5	0.700	2.5	1.200	1376.1	1.600	1651.7
0.300	2.5	0.800	2.5	1.300	1442.6	1.703	1726.7
0.400	2.5	0.900	2.5	1.400	1510.7		

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Summary of Critical Results by Maximum Level (Rank 1) for SW_3

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS10C	15 Winter	100	+20%				
S1.001	SS9C	15 Winter	100	+20%				
S2.000	SS08C-3	15 Winter	100	+20%				
S2.001	SS08C-2	15 Winter	100	+20%	100/15 Summer			
S2.002	SS08C-1	15 Winter	100	+20%	100/15 Summer			
S1.002	SS08C	30 Summer	100	+20%	5/15 Winter			
S3.000	SS07C-3	15 Winter	100	+20%				
S3.001	SS07C-2	15 Winter	100	+20%	100/15 Winter			
S3.002	SS07C-1	30 Summer	100	+20%	100/15 Winter			
S1.003	SS07C	30 Summer	100	+20%	1/30 Winter			
S4.000	SS06C-1	360 Winter	100	+20%	30/120 Winter			
S1.004	SS06C	360 Winter	100	+20%	1/15 Summer			
S5.000	SS05C-3	15 Winter	100	+20%	5/30 Winter			
S6.000	SS05C-2-2	15 Winter	100	+20%				
S6.001	SS05C-2-1	15 Winter	100	+20%				
S5.001	SS05C-2	15 Winter	100	+20%	1/180 Winter			
S5.002	SS05C-1	360 Winter	100	+20%	1/15 Summer			
S1.005	SS05C-ATN	360 Winter	100	+20%	1/15 Summer			
S1.006	SS04C	360 Winter	100	+20%	1/15 Summer			
S7.000	SS03C-3	15 Winter	100	+20%				

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Summary of Critical Results by Maximum Level (Rank 1) for SW_3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SS10C	55.958	-0.136	0.000	0.33			17.2	OK
S1.001	SS9C	55.708	-0.139	0.000	0.31			32.8	OK
S2.000	SS08C-3	55.350	-0.082	0.000	0.57			21.7	OK
S2.001	SS08C-2	55.292	0.119	0.000	0.91			44.0	SURCHARGED
S2.002	SS08C-1	54.950	0.300	0.000	0.82			59.2	SURCHARGED
S1.002	SS08C	54.777	0.396	0.000	0.72			105.3	SURCHARGED
S3.000	SS07C-3	55.270	-0.030	0.000	0.91			31.9	OK
S3.001	SS07C-2	55.121	0.002	0.000	0.99			73.9	SURCHARGED
S3.002	SS07C-1	54.852	0.020	0.000	0.37			110.0	SURCHARGED
S1.003	SS07C	54.700	0.458	0.000	0.89			223.0	SURCHARGED
S4.000	SS06C-1	54.561	0.237	0.000	0.05			1.9	SURCHARGED
S1.004	SS06C	54.560	0.612	0.000	0.24			59.3	SURCHARGED
S5.000	SS05C-3	54.812	0.503	0.000	0.56			20.2	SURCHARGED
S6.000	SS05C-2-2	55.301	-0.114	0.000	0.48			32.8	OK
S6.001	SS05C-2-1	54.915	-0.102	0.000	0.57			57.4	OK
S5.001	SS05C-2	54.756	0.555	0.000	0.99			86.3	SURCHARGED
S5.002	SS05C-1	54.561	0.628	0.000	0.21			16.4	SURCHARGED
S1.005	SS05C-ATN	54.559	0.662	0.000	0.29			79.2	SURCHARGED
S1.006	SS04C	54.557	0.726	0.000	0.29			79.1	SURCHARGED
S7.000	SS03C-3	55.606	-0.152	0.000	0.22			16.4	OK

PN	US/MH Name	Level Exceeded
S1.000	SS10C	
S1.001	SS9C	
S2.000	SS08C-3	
S2.001	SS08C-2	
S2.002	SS08C-1	
S1.002	SS08C	
S3.000	SS07C-3	
S3.001	SS07C-2	
S3.002	SS07C-1	
S1.003	SS07C	
S4.000	SS06C-1	
S1.004	SS06C	
S5.000	SS05C-3	
S6.000	SS05C-2-2	
S6.001	SS05C-2-1	
S5.001	SS05C-2	
S5.002	SS05C-1	
S1.005	SS05C-ATN	
S1.006	SS04C	
S7.000	SS03C-3	

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Summary of Critical Results by Maximum Level (Rank 1) for SW_3

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S7.001	SS03C-2	360 Winter	100	+20%	5/360 Winter			
S7.002	SS03C-1	360 Winter	100	+20%	1/15 Summer			
S1.007	SS03C-HB	360 Winter	100	+20%	1/15 Summer			
S1.008	SS02C-PI	10080 Winter	100	+20%				
S1.009	SS01C	10080 Summer	100	+20%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S7.001	SS03C-2	54.558	0.282	0.000	0.11			6.7	SURCHARGED
S7.002	SS03C-1	54.556	0.711	0.000	0.21			7.6	SURCHARGED
S1.007	SS03C-HB	54.556	0.788	0.000	0.02			5.7	SURCHARGED
S1.008	SS02C-PI	53.233	-0.155	0.000	0.21			5.7	OK
S1.009	SS01C	53.203	-0.159	0.000	0.19			5.7	OK

PN	US/MH Name	Level Exceeded
S7.001	SS03C-2	
S7.002	SS03C-1	
S1.007	SS03C-HB	
S1.008	SS02C-PI	
S1.009	SS01C	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_4

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.850	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for SW_4

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	39.274	0.258	152.2	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	17.913	0.107	167.4	0.037	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	41.125	0.171	240.5	0.048	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	24.417	0.146	167.2	0.041	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	23.584	0.141	167.3	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	16.626	0.104	159.9	0.047	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.000	17.710	0.466	38.0	0.072	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	100.00	5.62	53.832	0.055	0.0	0.0	3.4	1.06	42.0	20.3
S2.000	100.00	5.30	53.681	0.037	0.0	0.0	2.3	1.01	40.1	13.6
S1.001	100.00	6.30	53.506	0.140	0.0	0.0	8.6	1.01	71.4	51.4
S3.000	100.00	5.40	53.948	0.041	0.0	0.0	2.5	1.01	40.1	15.1
S3.001	100.00	5.79	53.802	0.064	0.0	0.0	3.9	1.01	40.1	23.4
S3.002	100.00	6.06	53.661	0.111	0.0	0.0	6.8	1.03	41.0	40.8
S4.000	100.00	5.14	54.023	0.072	0.0	0.0	4.4	2.13	84.6	26.6

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Network Design Table for SW_4

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.003	58.632	0.147	400.0	0.101	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.002	27.356	0.054	506.6	0.175	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.003	13.458	0.026	517.6	0.050	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	29.680	0.058	511.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	41.410	0.081	511.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.006	39.928	0.078	511.9	0.027	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	7.316	0.030	240.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	68.839	0.287	239.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.009	18.955	0.135	140.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.003	98.88	7.03	53.332	0.284	0.0	0.0	17.3	1.01	160.7	103.5
S1.002	96.71	7.45	53.035	0.599	0.0	0.0	35.6	1.08	304.0	213.5
S1.003	95.68	7.66	52.981	0.650	0.0	0.0	38.2	1.06	300.7	228.9
S1.004	93.51	8.13	52.955	0.650	0.0	0.0	38.2	1.07	302.4	228.9
S1.005	90.68	8.77	52.897	0.650	0.0	0.0	38.2	1.07	302.6	228.9
S1.006	88.15	9.39	52.816	0.677	0.0	0.0	38.2	1.07	302.4	228.9
S1.007	87.68	9.51	52.738	0.677	0.0	0.0	38.2	1.01	71.4«	228.9
S1.008	83.54	10.65	52.708	0.677	0.0	0.0	38.2	1.01	71.4«	228.9
S1.009	82.73	10.89	52.421	0.677	0.0	0.0	38.2	1.32	93.7«	228.9

Free Flowing Outfall Details for SW_4

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.009	SS00D	53.421	52.286	53.100	0	0

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Online Controls for SW_4

Hydro-Brake® Optimum Manhole: SS04D-ATN, DS/PN: S1.006, Volume (m³): 15.9

Unit Reference	MD-SHE-0081-3100-1200-3100
Design Head (m)	1.200
Design Flow (l/s)	3.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	81
Invert Level (m)	52.816
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	3.1
Flush-Flo™	0.356	3.1
Kick-Flo®	0.723	2.5
Mean Flow over Head Range	-	2.7

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	2.3	1.200	3.1	3.000	4.7	7.000	7.1
0.200	2.9	1.400	3.3	3.500	5.1	7.500	7.3
0.300	3.0	1.600	3.5	4.000	5.4	8.000	7.5
0.400	3.0	1.800	3.7	4.500	5.7	8.500	7.7
0.500	3.0	2.000	3.9	5.000	6.0	9.000	7.9
0.600	2.8	2.200	4.1	5.500	6.3	9.500	8.2
0.800	2.6	2.400	4.3	6.000	6.6		
1.000	2.8	2.600	4.4	6.500	6.8		

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Storage Structures for SW_4

Tank or Pond Manhole: SS04D-ATN, DS/PN: S1.006

Invert Level (m) 52.816

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.700	2.5	1.400	2.5	2.100	1076.4
0.100	2.5	0.800	2.5	1.500	2.5	2.184	1125.8
0.200	2.5	0.900	2.5	1.600	2.5	2.200	1135.3
0.300	2.5	1.000	2.5	1.700	2.5	2.300	1195.8
0.400	2.5	1.100	2.5	1.800	909.0	2.400	1257.9
0.500	2.5	1.200	2.5	1.900	963.2	2.500	1321.6
0.600	2.5	1.300	2.5	2.000	1019.0	2.595	1383.5

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Summary of Critical Results by Maximum Level (Rank 1) for SW_4

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS10D	60 Winter	100	+20%	1/180 Winter			
S2.000	SS09D-1	360 Winter	100	+20%	1/120 Winter			
S1.001	SS09D	360 Winter	100	+20%	1/120 Winter			
S3.000	SS08D-4	30 Winter	100	+20%	5/60 Summer			
S3.001	SS08D-3	30 Winter	100	+20%	1/180 Winter			
S3.002	SS08D-2	30 Winter	100	+20%	1/120 Winter			
S4.000	SS08D-1-1	360 Winter	100	+20%	5/60 Winter			
S3.003	SS08D-1	360 Winter	100	+20%	1/120 Winter			
S1.002	SS08D	360 Winter	100	+20%	1/60 Winter			
S1.003	SS07D	360 Winter	100	+20%	1/60 Summer			
S1.004	SS06D	360 Winter	100	+20%	1/60 Summer			
S1.005	SS05D	360 Winter	100	+20%	1/30 Winter			
S1.006	SS04D-ATN	360 Winter	100	+20%	1/30 Summer			
S1.007	SS03D-HB	360 Winter	100	+20%				
S1.008	SS02D-PI	360 Winter	100	+20%				
S1.009	SS01D	360 Winter	100	+20%				

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Summary of Critical Results by Maximum Level (Rank 1) for SW_4

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SS10D	54.834	0.777	0.000	0.28			11.0	FLOOD RISK
S2.000	SS09D-1	54.822	0.916	0.000	0.07			2.4	FLOOD RISK
S1.001	SS09D	54.821	1.015	0.000	0.14			9.1	FLOOD RISK
S3.000	SS08D-4	54.890	0.717	0.000	0.31			11.6	FLOOD RISK
S3.001	SS08D-3	54.866	0.839	0.000	0.47			17.3	FLOOD RISK
S3.002	SS08D-2	54.832	0.946	0.000	0.76			27.5	SURCHARGED
S4.000	SS08D-1-1	54.822	0.574	0.000	0.06			4.7	SURCHARGED
S3.003	SS08D-1	54.821	1.039	0.000	0.13			18.6	SURCHARGED
S1.002	SS08D	54.819	1.184	0.000	0.16			39.3	SURCHARGED
S1.003	SS07D	54.818	1.237	0.000	0.27			42.6	SURCHARGED
S1.004	SS06D	54.817	1.262	0.000	0.17			42.5	SURCHARGED
S1.005	SS05D	54.816	1.319	0.000	0.16			42.4	SURCHARGED
S1.006	SS04D-ATN	54.815	1.399	0.000	0.02			3.9	SURCHARGED
S1.007	SS03D-HB	52.792	-0.246	0.000	0.07			3.9	OK
S1.008	SS02D-PI	52.754	-0.254	0.000	0.06			3.9	OK
S1.009	SS01D	52.463	-0.258	0.000	0.05			3.9	OK

PN	US/MH Name	Level Exceeded
S1.000	SS10D	
S2.000	SS09D-1	
S1.001	SS09D	
S3.000	SS08D-4	
S3.001	SS08D-3	
S3.002	SS08D-2	
S4.000	SS08D-1-1	
S3.003	SS08D-1	
S1.002	SS08D	
S1.003	SS07D	
S1.004	SS06D	
S1.005	SS05D	
S1.006	SS04D-ATN	
S1.007	SS03D-HB	
S1.008	SS02D-PI	
S1.009	SS01D	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_5

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.200
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.850	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for SW_5

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	41.481	0.277	149.8	0.080	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	37.527	0.208	180.4	0.105	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	16.422	0.097	169.3	0.036	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	19.324	0.114	169.5	0.033	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.002	13.906	0.082	169.6	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.003	12.227	0.072	169.8	0.012	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	8.549	0.036	240.0	0.024	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	8.549	0.036	237.5	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	5.016	0.050	100.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.65	53.460	0.080	0.0	0.0	2.5	1.07	42.4	14.8
S1.001	50.00	6.29	53.183	0.185	0.0	0.0	5.7	0.97	38.6	34.1
S2.000	50.00	5.27	53.340	0.036	0.0	0.0	1.1	1.00	39.8	6.6
S2.001	50.00	5.59	53.243	0.069	0.0	0.0	2.1	1.00	39.8	12.7
S2.002	50.00	5.83	53.129	0.079	0.0	0.0	2.4	1.00	39.8	14.6
S2.003	50.00	6.03	53.047	0.092	0.0	0.0	2.8	1.00	39.8	16.9
S1.002	50.00	6.43	52.900	0.300	0.0	0.0	9.2	1.01	71.4	55.3
S1.003	50.00	6.57	52.864	0.314	0.0	0.0	9.6	1.02	71.8	57.8
S1.004	50.00	6.63	52.828	0.314	0.0	0.0	9.6	1.57	111.0	57.8

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Free Flowing Outfall Details for SW_5

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.004	SS00E	54.210	52.778	52.750	1200	0

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Online Controls for SW_5

Hydro-Brake® Optimum Manhole: SS02E-ATN, DS/PN: S1.003, Volume (m³): 2.1

Unit Reference	MD-SHE-0071-2400-1200-2400
Design Head (m)	1.200
Design Flow (l/s)	2.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	71
Invert Level (m)	52.864
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.4
Flush-Flo™	0.312	2.2
Kick-Flo®	0.631	1.8
Mean Flow over Head Range	-	2.0

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	1.8	1.200	2.4	3.000	3.7	7.000	5.4
0.200	2.1	1.400	2.6	3.500	3.9	7.500	5.6
0.300	2.2	1.600	2.7	4.000	4.2	8.000	5.8
0.400	2.2	1.800	2.9	4.500	4.4	8.500	6.0
0.500	2.1	2.000	3.0	5.000	4.6	9.000	6.1
0.600	1.9	2.200	3.2	5.500	4.9	9.500	6.3
0.800	2.0	2.400	3.3	6.000	5.1		
1.000	2.2	2.600	3.4	6.500	5.2		

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Storage Structures for SW_5

Tank or Pond Manhole: SS02E-ATN, DS/PN: S1.003

Invert Level (m) 52.864

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.400	2.5	0.800	2.5	1.200	813.3
0.100	2.5	0.500	2.5	0.900	2.5	1.300	864.7
0.200	2.5	0.600	2.5	1.000	2.5	1.376	904.7
0.300	2.5	0.700	2.5	1.100	763.6		

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Summary of Critical Results by Maximum Level (Rank 1) for SW_5

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS05E	15 Winter	100	+20%	1/30 Summer			
S1.001	SS04E	15 Winter	100	+20%	1/15 Summer			
S2.000	SS03E-4	30 Summer	100	+20%	1/15 Winter			
S2.001	SS03E-3	30 Summer	100	+20%	1/15 Summer			
S2.002	SS03E-2	30 Summer	100	+20%	1/15 Summer			
S2.003	SS03E-1	30 Summer	100	+20%	1/15 Summer			
S1.002	SS03E	120 Winter	100	+20%	1/15 Summer			
S1.003	SS02E-ATN	360 Winter	100	+20%	1/15 Summer			
S1.004	SS01E-HB	360 Winter	100	+20%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SS05E	54.693	1.008	0.000	0.64			25.8	SURCHARGED
S1.001	SS04E	54.579	1.171	0.000	1.51			55.1	FLOOD RISK
S2.000	SS03E-4	54.315	0.750	0.000	0.32			11.4	SURCHARGED
S2.001	SS03E-3	54.294	0.826	0.000	0.59			21.4	SURCHARGED
S2.002	SS03E-2	54.228	0.874	0.000	0.70			24.4	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for SW_5

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S2.003	SS03E-1	54.157	0.885	0.000	0.82			27.9	SURCHARGED
S1.002	SS03E	54.087	0.887	0.000	0.77			41.8	SURCHARGED
S1.003	SS02E-ATN	54.072	0.908	0.000	0.04			2.4	FLOOD RISK
S1.004	SS01E-HB	52.866	-0.262	0.000	0.04			2.4	OK

PN	US/MH Name	Level Exceeded
S1.000	SS05E	
S1.001	SS04E	
S2.000	SS03E-4	
S2.001	SS03E-3	
S2.002	SS03E-2	
S2.003	SS03E-1	
S1.002	SS03E	
S1.003	SS02E-ATN	
S1.004	SS01E-HB	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW_6

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	16.300	Add Flow / Climate Change (%)	20
Ratio R	0.277	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for SW_6

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	37.488	0.301	124.5	0.073	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	32.433	0.246	131.8	0.064	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	30.120	0.125	241.0	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	34.530	0.144	239.8	0.101	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	53.925	0.225	239.7	0.151	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	57.640	0.773	74.6	0.135	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	16.699	0.119	140.3	0.077	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	19.132	0.043	444.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	100.00	5.53	54.857	0.073	0.0	0.0	4.0	1.17	46.5	23.9
S1.001	100.00	6.01	54.556	0.137	0.0	0.0	7.4	1.14	45.2	44.5
S1.002	100.00	6.51	54.235	0.171	0.0	0.0	9.3	1.01	71.3	55.6
S1.003	98.63	7.08	54.110	0.272	0.0	0.0	14.6	1.01	71.5«	87.3
S2.000	100.00	5.89	54.191	0.151	0.0	0.0	8.2	1.01	71.5	49.2
S3.000	100.00	5.63	54.814	0.135	0.0	0.0	7.3	1.52	60.3	43.8
S1.004	97.79	7.24	53.816	0.636	0.0	0.0	33.7	1.71	272.7	202.1
S1.005	96.40	7.52	53.547	0.636	0.0	0.0	33.7	1.15	324.6	202.1

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Network Design Table for SW_6

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.006	27.316	0.057	479.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	15.174	0.032	480.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S4.000	39.839	0.234	170.3	0.134	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	14.264	0.085	167.8	0.039	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	26.782	0.112	239.1	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.002	18.140	0.076	238.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.003	43.392	0.181	239.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	21.591	0.048	449.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.009	6.465	0.038	170.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	7.948	0.079	100.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.006	94.43	7.93	53.504	0.636	0.0	0.0	33.7	1.11	312.6	202.1
S1.007	93.37	8.16	53.447	0.636	0.0	0.0	33.7	1.10	312.4	202.1
S4.000	100.00	5.66	54.243	0.134	0.0	0.0	7.3	1.00	39.7«	43.5
S5.000	100.00	5.24	54.094	0.039	0.0	0.0	2.1	1.01	40.0	12.7
S4.001	100.00	6.11	53.934	0.204	0.0	0.0	11.0	1.01	71.6	66.2
S4.002	100.00	6.40	53.822	0.204	0.0	0.0	11.0	1.01	71.6	66.2
S4.003	98.41	7.12	53.746	0.204	0.0	0.0	11.0	1.01	71.5	66.2
S1.008	91.97	8.47	53.415	0.840	0.0	0.0	41.8	1.14	322.8	250.9
S1.009	91.50	8.58	53.367	0.840	0.0	0.0	41.8	1.00	39.7«	250.9
S1.010	91.07	8.68	53.329	0.840	0.0	0.0	41.8	1.30	51.8«	250.9

Free Flowing Outfall Details for SW_6

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.010	SOF-6F	55.500	53.250	53.250	0	0

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Online Controls for SW_6

Hydro-Brake® Optimum Manhole: SS02F-ATN, DS/PN: S1.008, Volume (m³): 10.2

Unit Reference	MD-SHE-0093-5000-1890-5000
Design Head (m)	1.890
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	93
Invert Level (m)	53.415
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.890	5.0
Flush-Flo™	0.408	4.3
Kick-Flo®	0.832	3.4
Mean Flow over Head Range	-	4.0

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	2.9	1.200	4.0	3.000	6.2	7.000	9.3
0.200	3.9	1.400	4.3	3.500	6.7	7.500	9.6
0.300	4.2	1.600	4.6	4.000	7.1	8.000	9.9
0.400	4.3	1.800	4.9	4.500	7.5	8.500	10.2
0.500	4.2	2.000	5.1	5.000	7.9	9.000	10.4
0.600	4.1	2.200	5.4	5.500	8.3	9.500	10.7
0.800	3.6	2.400	5.6	6.000	8.6		
1.000	3.7	2.600	5.8	6.500	8.9		

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Storage Structures for SW_6

Complex Manhole: SS02F-ATN, DS/PN: S1.008

Tank or Pond

Invert Level (m) 53.410

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.500	2.5	1.000	2.5	1.500	134.8
0.100	2.5	0.600	2.5	1.100	65.0	1.600	156.1
0.200	2.5	0.700	2.5	1.200	80.1	1.700	179.1
0.300	2.5	0.800	2.5	1.300	96.8	1.800	203.6
0.400	2.5	0.900	2.5	1.400	115.0	1.890	227.0

Tank or Pond

Invert Level (m) 53.410

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.500	2.5	1.000	2.5	1.500	36.8
0.100	2.5	0.600	2.5	1.100	6.4	1.600	48.4
0.200	2.5	0.700	2.5	1.200	11.6	1.700	61.5
0.300	2.5	0.800	2.5	1.300	18.4	1.800	76.1
0.400	2.5	0.900	2.5	1.400	26.8	1.890	90.7

Tank or Pond

Invert Level (m) 53.410

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.500	2.5	1.000	2.5	1.500	241.4
0.100	2.5	0.600	2.5	1.100	143.8	1.600	269.7
0.200	2.5	0.700	2.5	1.200	165.9	1.700	299.6
0.300	2.5	0.800	2.5	1.300	189.5	1.800	331.1
0.400	2.5	0.900	2.5	1.400	214.7	1.890	360.8

Tank or Pond

Invert Level (m) 53.410

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2.5	0.500	2.5	1.000	2.5	1.500	26.6
0.100	2.5	0.600	2.5	1.100	2.6	1.600	36.5
0.200	2.5	0.700	2.5	1.200	6.2	1.700	48.0
0.300	2.5	0.800	2.5	1.300	11.5	1.800	61.1
0.400	2.5	0.900	2.5	1.400	18.2	1.890	74.2

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Summary of Critical Results by Maximum Level (Rank 1) for SW_6

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 10080
Return Period(s) (years)	1, 5, 30, 100
Climate Change (%)	0, 0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SS10F	30 Winter	100	+20%	100/15 Summer			
S1.001	SS09F	30 Winter	100	+20%	30/30 Summer			
S1.002	SS08F	240 Winter	100	+20%	1/120 Winter			
S1.003	SS07F	360 Winter	100	+20%	1/60 Summer			
S2.000	SS06F-1	360 Winter	100	+20%	1/60 Winter			
S3.000	SS06F-0-1	360 Winter	100	+20%	100/15 Summer			
S1.004	SS06F	360 Winter	100	+20%	1/30 Winter			
S1.005	SS05F	360 Winter	100	+20%	1/30 Summer			
S1.006	SS04F	360 Winter	100	+20%	1/15 Winter			
S1.007	SS03F	360 Winter	100	+20%	1/15 Summer			
S4.000	SS02F-4	360 Winter	100	+20%	1/60 Winter			
S5.000	SS02F-3-1	360 Winter	100	+20%	1/30 Winter			
S4.001	SS02F-3	360 Winter	100	+20%	1/30 Summer			
S4.002	SS02F-2	360 Winter	100	+20%	1/15 Winter			
S4.003	SS02F-1	360 Winter	100	+20%	1/15 Summer			
S1.008	SS02F-ATN	360 Winter	100	+20%	1/15 Summer			
S1.009	SS01A-PI-F	360 Winter	100	+20%				

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Summary of Critical Results by Maximum Level (Rank 1) for SW_6

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SS10F	55.293	0.211	0.000	0.46			20.4	SURCHARGED
S1.001	SS09F	55.238	0.457	0.000	0.84			35.8	SURCHARGED
S1.002	SS08F	55.218	0.683	0.000	0.22			14.1	SURCHARGED
S1.003	SS07F	55.215	0.805	0.000	0.26			17.1	SURCHARGED
S2.000	SS06F-1	55.214	0.723	0.000	0.14			9.7	SURCHARGED
S3.000	SS06F-0-1	55.216	0.177	0.000	0.15			8.6	SURCHARGED
S1.004	SS06F	55.212	0.946	0.000	0.21			40.1	SURCHARGED
S1.005	SS05F	55.211	1.064	0.000	0.18			39.9	SURCHARGED
S1.006	SS04F	55.210	1.106	0.000	0.16			39.7	SURCHARGED
S1.007	SS03F	55.209	1.162	0.000	0.23			39.5	SURCHARGED
S4.000	SS02F-4	55.217	0.749	0.000	0.23			8.6	SURCHARGED
S5.000	SS02F-3-1	55.214	0.895	0.000	0.07			2.4	FLOOD RISK
S4.001	SS02F-3	55.214	0.980	0.000	0.20			12.8	FLOOD RISK
S4.002	SS02F-2	55.212	1.090	0.000	0.21			12.7	FLOOD RISK
S4.003	SS02F-1	55.210	1.164	0.000	0.19			12.6	FLOOD RISK
S1.008	SS02F-ATN	55.208	1.193	0.000	0.02			4.9	FLOOD RISK
S1.009	SS01A-PI-F	53.427	-0.165	0.000	0.16			4.9	OK

PN	US/MH Name	Level Exceeded
S1.000	SS10F	
S1.001	SS09F	
S1.002	SS08F	
S1.003	SS07F	
S2.000	SS06F-1	
S3.000	SS06F-0-1	
S1.004	SS06F	
S1.005	SS05F	
S1.006	SS04F	
S1.007	SS03F	
S4.000	SS02F-4	
S5.000	SS02F-3-1	
S4.001	SS02F-3	
S4.002	SS02F-2	
S4.003	SS02F-1	
S1.008	SS02F-ATN	
S1.009	SS01A-PI-F	

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Summary of Critical Results by Maximum Level (Rank 1) for SW_6

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.010	SS01F	360 Winter	100	+20%					53.381

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.010	SS01F	-0.173	0.000	0.12			4.9	OK	

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Appendix G : Foul Water Calculations

FOUL SEWERAGE DESIGN

Design Criteria for FS_1

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Calculation Method	EN 752	Maximum Backdrop Height (m)	2.300
Frequency Factor	0.50	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	300

Designed with Level Soffits

Network Design Table for FS_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	18.914	0.172	110.0	0.000	50.4	0.0	0.600	o	150	Pipe/Conduit	
F1.001	48.900	0.326	150.0	0.000	84.0	0.0	0.600	o	150	Pipe/Conduit	
F2.000	7.610	0.147	51.8	0.000	47.0	0.0	0.600	o	150	Pipe/Conduit	
F1.002	75.910	0.506	150.0	0.000	67.2	0.0	0.600	o	150	Pipe/Conduit	
F1.003	2.639	0.018	150.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F3.000	44.960	0.483	93.1	0.000	29.4	0.0	0.600	o	150	Pipe/Conduit	
F4.000	15.847	0.469	33.8	0.000	16.8	0.0	0.600	o	150	Pipe/Conduit	
F3.001	21.616	0.145	149.0	0.000	54.6	0.0	0.600	o	150	Pipe/Conduit	
F3.002	38.646	0.214	180.6	0.000	46.2	0.0	0.600	o	150	Pipe/Conduit	
F3.003	16.471	0.214	77.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F1.004	67.989	0.360	189.1	0.000	67.2	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	54.335	0.000	0.0	50.4	0.0	47	0.76	0.96	16.9	3.5
F1.001	54.163	0.000	0.0	134.4	0.0	66	0.77	0.82	14.5	5.8
F2.000	53.983	0.000	0.0	47.0	0.0	38	0.99	1.40	24.8	3.4
F1.002	53.836	0.000	0.0	248.6	0.0	79	0.84	0.82	14.5	7.9
F1.003	53.330	0.000	0.0	248.6	0.0	79	0.84	0.82	14.5	7.9
F3.000	54.388	0.000	0.0	29.4	0.0	39	0.75	1.04	18.4	2.7
F4.000	54.373	0.000	0.0	16.8	0.0	26	0.99	1.74	30.7	2.0
F3.001	53.905	0.000	0.0	100.8	0.0	61	0.75	0.82	14.5	5.0
F3.002	53.760	0.000	0.0	147.0	0.0	71	0.73	0.74	13.2	6.1
F3.003	53.546	0.000	0.0	147.0	0.0	56	1.00	1.15	20.3	6.1
F1.004	53.257	0.000	0.0	462.8	0.0	82	0.82	0.95	37.7	10.8

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Network Design Table for FS_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F5.000	34.147	0.557	61.3	0.000	21.0	0.0	0.600	o	150	Pipe/Conduit	
F6.000	39.269	0.823	47.7	0.000	25.2	0.0	0.600	o	150	Pipe/Conduit	
F5.001	39.968	0.307	130.2	0.000	42.0	0.0	0.600	o	150	Pipe/Conduit	
F5.002	37.525	0.376	99.8	0.000	16.8	0.0	0.600	o	150	Pipe/Conduit	
F1.005	71.534	0.359	199.5	0.000	67.2	0.0	0.600	o	225	Pipe/Conduit	
F7.000	50.552	0.842	60.0	0.000	29.4	0.0	0.600	o	150	Pipe/Conduit	
F7.001	18.662	0.487	38.3	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F1.006	7.285	0.036	200.0	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F8.000	42.894	0.536	80.0	0.000	180.0	0.0	0.600	o	225	Pipe/Conduit	
F1.007	15.293	0.256	59.7	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F1.008	75.833	0.880	86.2	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F1.009	51.667	0.397	130.3	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F9.000	51.433	0.959	53.6	0.000	16.8	0.0	0.600	o	150	Pipe/Conduit	
F9.001	83.742	0.761	110.0	0.000	46.2	0.0	0.600	o	150	Pipe/Conduit	
F9.002	61.927	0.563	110.0	0.000	100.8	0.0	0.600	o	150	Pipe/Conduit	
F9.003	32.234	0.396	81.4	0.000	4.2	0.0	0.600	o	150	Pipe/Conduit	
F9.004	6.929	0.111	62.4	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F5.000	54.215	0.000	0.0	21.0	0.0	32	0.83	1.29	22.7	2.3
F6.000	54.481	0.000	0.0	25.2	0.0	32	0.93	1.46	25.8	2.5
F5.001	53.658	0.000	0.0	88.2	0.0	56	0.77	0.88	15.5	4.7
F5.002	53.351	0.000	0.0	105.0	0.0	55	0.87	1.01	17.8	5.1
F1.005	52.897	0.000	0.0	635.0	0.0	91	0.84	0.92	36.7	12.6
F7.000	53.949	0.000	0.0	29.4	0.0	35	0.88	1.30	23.0	2.7
F7.001	53.107	0.000	0.0	29.4	0.0	31	1.03	1.63	28.8	2.7
F1.006	52.538	0.000	0.0	664.4	0.0	92	0.84	0.92	36.6	12.9
F8.000	53.851	0.000	0.0	180.0	0.0	51	0.98	1.46	58.2	6.7
F1.007	52.508	0.000	0.0	844.4	0.0	71	1.36	1.70	67.4	14.5
F1.008	52.252	0.000	0.0	844.4	0.0	78	1.19	1.41	56.0	14.5
F1.009	51.372	0.000	0.0	844.4	0.0	87	1.02	1.14	45.5	14.5
F9.000	55.084	0.000	0.0	16.8	0.0	29	0.84	1.38	24.3	2.0
F9.001	54.125	0.000	0.0	63.0	0.0	49	0.78	0.96	16.9	4.0
F9.002	53.364	0.000	0.0	163.8	0.0	64	0.89	0.96	16.9	6.4
F9.003	52.801	0.000	0.0	168.0	0.0	59	1.00	1.12	19.7	6.5
F9.004	52.405	0.000	0.0	168.0	0.0	55	1.10	1.28	22.5	6.5

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Network Design Table for FS_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.010	5.332	0.036	148.1	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F10.000	21.153	0.353	59.9	0.000	16.8	0.0	0.600	o	150	Pipe/Conduit	
F11.000	22.494	0.439	51.2	0.000	25.2	0.0	0.600	o	150	Pipe/Conduit	
F10.001	21.141	0.151	140.0	0.000	42.0	0.0	0.600	o	150	Pipe/Conduit	
F10.002	38.563	0.247	156.1	0.000	67.2	0.0	0.600	o	150	Pipe/Conduit	
F12.000	18.306	0.574	31.9	0.000	25.2	0.0	0.600	o	150	Pipe/Conduit	
F10.003	41.509	0.277	150.0	0.000	25.2	0.0	0.600	o	150	Pipe/Conduit	
F10.004	39.269	0.785	50.0	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F10.005	33.224	0.711	46.7	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F13.000	33.195	0.300	110.7	0.000	50.4	0.0	0.600	o	150	Pipe/Conduit	
F13.001	42.048	0.284	148.1	0.000	50.4	0.0	0.600	o	150	Pipe/Conduit	
F13.002	21.991	0.220	100.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F13.003	26.177	0.524	50.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F10.006	11.962	0.505	23.7	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F10.007	23.676	0.118	200.0	0.000	0.0	0.0	0.600	o	225	Pipe/Conduit	
F10.008	82.387	0.412	200.0	0.000	67.2	0.0	0.600	o	225	Pipe/Conduit	
F10.009	12.503	0.063	198.5	0.000	16.8	0.0	0.600	o	225	Pipe/Conduit	
F10.010	23.365	0.111	210.5	0.000	0.0	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.010	50.975	0.000	0.0	1012.4	0.0	95	1.00	1.07	42.6	15.9
F10.000	54.021	0.000	0.0	16.8	0.0	30	0.81	1.30	23.0	2.0
F11.000	54.107	0.000	0.0	25.2	0.0	32	0.90	1.41	24.9	2.5
F10.001	53.668	0.000	0.0	84.0	0.0	57	0.75	0.85	15.0	4.6
F10.002	53.517	0.000	0.0	151.2	0.0	69	0.77	0.80	14.2	6.1
F12.000	53.844	0.000	0.0	25.2	0.0	29	1.07	1.79	31.6	2.5
F10.003	53.270	0.000	0.0	201.6	0.0	74	0.81	0.82	14.5	7.1
F10.004	52.919	0.000	0.0	201.6	0.0	47	1.18	1.85	73.7	7.1
F10.005	52.134	0.000	0.0	201.6	0.0	46	1.21	1.92	76.3	7.1
F13.000	53.040	0.000	0.0	50.4	0.0	47	0.76	0.95	16.9	3.5
F13.001	52.740	0.000	0.0	100.8	0.0	61	0.75	0.82	14.6	5.0
F13.002	52.456	0.000	0.0	100.8	0.0	55	0.87	1.00	17.8	5.0
F13.003	52.236	0.000	0.0	100.8	0.0	45	1.12	1.43	25.2	5.0
F10.006	51.423	0.000	0.0	302.4	0.0	43	1.64	2.70	107.3	8.7
F10.007	50.918	0.000	0.0	302.4	0.0	74	0.76	0.92	36.6	8.7
F10.008	50.800	0.000	0.0	369.6	0.0	79	0.78	0.92	36.6	9.6
F10.009	50.388	0.000	0.0	386.4	0.0	79	0.79	0.92	36.8	9.8
F10.010	50.250	0.000	0.0	386.4	0.0	72	0.75	1.08	76.3	9.8

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Network Design Table for FS_1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F10.011	28.095	0.128	219.5	0.000	50.4	0.0	0.600	o	300	Pipe/Conduit	
F10.012	83.995	0.382	219.9	0.000	12.6	0.0	0.600	o	300	Pipe/Conduit	
F10.013	70.289	0.306	229.7	0.000	25.2	0.0	0.600	o	300	Pipe/Conduit	
F10.014	17.534	0.076	230.7	0.000	4.2	0.0	0.600	o	300	Pipe/Conduit	
F10.015	20.105	0.087	231.1	0.000	0.0	0.0	0.600	o	300	Pipe/Conduit	
F10.016	32.231	0.138	233.6	0.000	8.4	0.0	0.600	o	300	Pipe/Conduit	
F14.000	43.195	0.781	55.3	0.000	16.8	0.0	0.600	o	150	Pipe/Conduit	
F14.001	24.609	0.333	73.9	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F14.002	59.399	0.424	140.1	0.000	67.2	0.0	0.600	o	150	Pipe/Conduit	
F14.003	61.413	0.409	150.2	0.000	67.2	0.0	0.600	o	150	Pipe/Conduit	
F14.004	24.613	0.308	79.9	0.000	21.0	0.0	0.600	o	150	Pipe/Conduit	
F14.005	14.347	0.179	80.0	0.000	0.0	0.0	0.600	o	150	Pipe/Conduit	
F10.017	38.074	0.159	239.5	0.000	8.4	0.0	0.600	o	300	Pipe/Conduit	
F10.018	21.072	0.088	239.5	0.000	8.4	0.0	0.600	o	300	Pipe/Conduit	
F1.011	8.274	0.055	150.4	0.000	0.0	0.0	0.600	o	300	Pipe/Conduit	
F1.012	5.489	0.037	150.0	0.000	0.0	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.011	50.139	0.000	0.0	436.8	0.0	75	0.75	1.06	74.7	10.4
F10.012	50.011	0.000	0.0	449.4	0.0	76	0.75	1.06	74.7	10.6
F10.013	49.629	0.000	0.0	474.6	0.0	78	0.75	1.03	73.0	10.9
F10.014	49.323	0.000	0.0	478.8	0.0	78	0.75	1.03	72.9	10.9
F10.015	49.247	0.000	0.0	478.8	0.0	78	0.75	1.03	72.8	10.9
F10.016	49.160	0.000	0.0	487.2	0.0	79	0.75	1.02	72.4	11.0
F14.000	56.219	0.000	0.0	16.8	0.0	30	0.83	1.36	24.0	2.0
F14.001	55.438	0.000	0.0	16.8	0.0	32	0.75	1.17	20.7	2.0
F14.002	55.105	0.000	0.0	84.0	0.0	57	0.75	0.85	15.0	4.6
F14.003	54.681	0.000	0.0	151.2	0.0	68	0.78	0.82	14.5	6.1
F14.004	53.548	0.000	0.0	172.2	0.0	59	1.01	1.13	19.9	6.6
F14.005	50.940	0.000	0.0	172.2	0.0	59	1.01	1.12	19.9	6.6
F10.017	49.022	0.000	0.0	667.8	0.0	86	0.77	1.01	71.5	12.9
F10.018	48.863	0.000	0.0	676.2	0.0	86	0.77	1.01	71.5	13.0
F1.011	48.775	0.000	0.0	1688.6	0.0	97	1.04	1.28	90.4	20.5
F1.012	48.720	0.000	0.0	1688.6	0.0	97	1.04	1.28	90.6	20.5

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Manhole Schedules for FS_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FFP13	55.485	1.150	Open Manhole	1200	F1.000	54.335	150				
FFP12	55.594	1.431	Open Manhole	1200	F1.001	54.163	150	F1.000	54.163	150	
FFP11-1	55.225	1.242	Open Manhole	1200	F2.000	53.983	150				
FFP11	55.476	1.640	Open Manhole	1200	F1.002	53.836	150	F1.001	53.837	150	1
								F2.000	53.836	150	
FFP10	55.767	2.437	Open Manhole	1200	F1.003	53.330	150	F1.002	53.330	150	
FFP9-3	55.738	1.350	Open Manhole	1200	F3.000	54.388	150				
FFP9-2-1	55.933	1.560	Open Manhole	1200	F4.000	54.373	150				
FFP9-2	56.006	2.102	Open Manhole	1200	F3.001	53.905	150	F3.000	53.905	150	
								F4.000	53.904	150	
FFP9-1	55.864	2.104	Open Manhole	1200	F3.002	53.760	150	F3.001	53.760	150	
F10	55.730	2.184	Open Manhole	1200	F3.003	53.546	150	F3.002	53.546	150	
FFP9	55.777	2.520	Open Manhole	1200	F1.004	53.257	225	F1.003	53.312	150	
								F3.003	53.332	150	
FFP8-3	55.568	1.353	Open Manhole	1200	F5.000	54.215	150				
FFP8-2-1	55.827	1.346	Open Manhole	1200	F6.000	54.481	150				
FFP8-2	55.533	1.875	Open Manhole	1200	F5.001	53.658	150	F5.000	53.658	150	
								F6.000	53.658	150	
FFP8-1	55.868	2.517	Open Manhole	1200	F5.002	53.351	150	F5.001	53.351	150	
FFP8	55.823	2.926	Open Manhole	1200	F1.005	52.897	225	F1.004	52.897	225	
								F5.002	52.975	150	3
FFP7-2	55.299	1.350	Open Manhole	1200	F7.000	53.949	150				
FFP7-1	55.839	2.732	Open Manhole	1200	F7.001	53.107	150	F7.000	53.107	150	
FFP7	56.035	3.497	Open Manhole	1200	F1.006	52.538	225	F1.005	52.538	225	
								F7.001	52.620	150	7
FFP6-1	56.276	2.425	Open Manhole	1200	F8.000	53.851	225				
FFP6	56.098	3.596	Open Manhole	1200	F1.007	52.508	225	F1.006	52.502	225	
								F8.000	53.315	225	807
FFP5	56.023	3.771	Open Manhole	1200	F1.008	52.252	225	F1.007	52.252	225	
FFP4	55.527	4.155	Open Manhole	1200	F1.009	51.372	225	F1.008	51.372	225	
FFP3-5	56.434	1.350	Open Manhole	1200	F9.000	55.084	150				
FFP3-4	55.475	1.350	Open Manhole	1200	F9.001	54.125	150	F9.000	54.125	150	
FFP3-3	55.731	2.367	Open Manhole	1200	F9.002	53.364	150	F9.001	53.364	150	
FFP3-2	55.550	2.749	Open Manhole	1200	F9.003	52.801	150	F9.002	52.801	150	
FFP3-1	55.858	3.453	Open Manhole	1200	F9.004	52.405	150	F9.003	52.405	150	
FFP3	55.734	4.759	Open Manhole	1200	F1.010	50.975	225	F1.009	50.975	225	
								F9.004	52.294	150	1244
FFP119	55.171	1.150	Open Manhole	1200	F10.000	54.021	150				
FFP118-1	55.457	1.350	Open Manhole	1200	F11.000	54.107	150				
FFP118	55.306	1.638	Open Manhole	1200	F10.001	53.668	150	F10.000	53.668	150	
								F11.000	53.668	150	
FFP117	55.316	1.799	Open Manhole	1200	F10.002	53.517	150	F10.001	53.517	150	
FFP116-1	55.276	1.432	Open Manhole	1200	F12.000	53.844	150				

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Manhole Schedules for FS_1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FFP116	55.238	1.968	Open Manhole	1200	F10.003	53.270	150	F10.002	53.270	150	
								F12.000	53.270	150	
FFP115	55.103	2.184	Open Manhole	1200	F10.004	52.919	225	F10.003	52.993	150	
FFP114	54.708	2.574	Open Manhole	1200	F10.005	52.134	225	F10.004	52.134	225	
FFP113-4	54.290	1.250	Open Manhole	1200	F13.000	53.040	150				
FFP113-3	53.990	1.250	Open Manhole	1200	F13.001	52.740	150	F13.000	52.740	150	
FFP113-2	54.329	1.873	Open Manhole	1200	F13.002	52.456	150	F13.001	52.456	150	
FFP113-1	54.521	2.285	Open Manhole	1200	F13.003	52.236	150	F13.002	52.236	150	
FFP113	54.756	3.333	Open Manhole	1200	F10.006	51.423	225	F10.005	51.423	225	
								F13.003	51.712	150	214
FFP112	55.250	4.332	Open Manhole	1200	F10.007	50.918	225	F10.006	50.918	225	
FFP111	55.446	4.646	Open Manhole	1200	F10.008	50.800	225	F10.007	50.800	225	
FFP110	57.108	6.720	Open Manhole	1200	F10.009	50.388	225	F10.008	50.388	225	
FFP109	57.419	7.169	Open Manhole	1200	F10.010	50.250	300	F10.009	50.325	225	
FFP108	57.639	7.500	Open Manhole	1200	F10.011	50.139	300	F10.010	50.139	300	
FFP107	57.776	7.765	Open Manhole	1200	F10.012	50.011	300	F10.011	50.011	300	
FFP106	57.183	7.554	Open Manhole	1200	F10.013	49.629	300	F10.012	49.629	300	
FFP105	56.608	7.285	Open Manhole	1200	F10.014	49.323	300	F10.013	49.323	300	
FFP104	56.474	7.227	Open Manhole	1200	F10.015	49.247	300	F10.014	49.247	300	
FFP103	56.312	7.152	Open Manhole	1200	F10.016	49.160	300	F10.015	49.160	300	
FFP102-6	57.569	1.350	Open Manhole	1200	F14.000	56.219	150				
FFP102-5	56.788	1.350	Open Manhole	1200	F14.001	55.438	150	F14.000	55.438	150	
FFP102-4	56.479	1.374	Open Manhole	1200	F14.002	55.105	150	F14.001	55.105	150	
FFP102-3	56.737	2.056	Open Manhole	1200	F14.003	54.681	150	F14.002	54.681	150	
FFP102-2	56.239	2.691	Open Manhole	1200	F14.004	53.548	150	F14.003	54.272	150	724
FFP102-1	55.813	4.873	Open Manhole	1200	F14.005	50.940	150	F14.004	53.240	150	2300
FFP102	56.053	7.031	Open Manhole	1200	F10.017	49.022	300	F10.016	49.022	300	
								F14.005	50.761	150	1589
FFP101	55.762	6.899	Open Manhole	1200	F10.018	48.863	300	F10.017	48.863	300	
FFP2	55.606	6.831	Open Manhole	1200	F1.011	48.775	300	F1.010	50.939	225	2089
								F10.018	48.775	300	
FFP1	55.470	6.750	Open Manhole	1200	F1.012	48.720	300	F1.011	48.720	300	
FFP0	55.523	6.839	Open Manhole	1800		OUTFALL		F1.012	48.683	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FFP13	697910.030	732848.327	697910.030	732848.327	Required	
FFP12	697913.341	732866.949	697913.341	732866.949	Required	

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Manhole Schedules for FS_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FFP11-1	697915.654	732919.161	697915.654	732919.161	Required	
FFP11	697922.067	732915.065	697922.067	732915.065	Required	
FFP10	697996.757	732901.507	697996.757	732901.507	Required	
FFP9-3	697938.712	732832.446	697938.712	732832.446	Required	
FFP9-2-1	697998.558	732821.721	697998.558	732821.721	Required	
FFP9-2	697983.039	732824.928	697983.039	732824.928	Required	
FFP9-1	697986.724	732846.228	697986.724	732846.228	Required	
F10	697993.411	732884.291	697993.411	732884.291	Required	
FFP9	697998.812	732899.851	697998.812	732899.851	Required	
FFP8-3	698085.958	732805.345	698085.958	732805.345	Required	
FFP8-2-1	698013.643	732817.994	698013.643	732817.994	Required	
FFP8-2	698052.376	732811.528	698052.376	732811.528	Required	
FFP8-1	698059.412	732850.872	698059.412	732850.872	Required	
FFP8	698065.735	732887.859	698065.735	732887.859	Required	
FFP7-2	698121.363	732808.403	698121.363	732808.403	Required	
FFP7-1	698129.728	732858.259	698129.728	732858.259	Required	
FFP7	698136.236	732875.748	698136.236	732875.748	Required	
FFP6-1	698099.963	732899.351	698099.963	732899.351	Required	

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Manhole Schedules for FS_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FFP6	698139.339	732882.339	698139.339	732882.339	Required	
FFP5	698154.052	732878.167	698154.052	732878.167	Required	
FFP4	698229.037	732866.853	698229.037	732866.853	Required	
FFP3-5	698373.415	733010.543	698373.415	733010.543	Required	
FFP3-4	698323.958	733024.662	698323.958	733024.662	Required	
FFP3-3	698300.745	732944.202	698300.745	732944.202	Required	
FFP3-2	698283.814	732884.634	698283.814	732884.634	Required	
FFP3-1	698278.022	732852.924	698278.022	732852.924	Required	
FFP3	698276.391	732846.190	698276.391	732846.190	Required	
FFP119	698328.816	733273.362	698328.816	733273.362	Required	
FFP118-1	698287.784	733258.480	698287.784	733258.480	Required	
FFP118	698308.882	733266.282	698308.882	733266.282	Required	
FFP117	698316.115	733246.417	698316.115	733246.417	Required	
FFP116-1	698312.261	733203.987	698312.261	733203.987	Required	
FFP116	698329.467	733210.239	698329.467	733210.239	Required	
FFP115	698368.344	733224.783	698368.344	733224.783	Required	
FFP114	698381.970	733187.953	698381.970	733187.953	Required	
FFP113-4	698301.112	733076.411	698301.112	733076.411	Required	

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Manhole Schedules for FS_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FFP113-3	698324.582	733099.885	698324.582	733099.885	Required	
FFP113-2	698353.342	733130.559	698353.342	733130.559	Required	
FFP113-1	698366.431	733148.231	698366.431	733148.231	Required	
FFP113	698391.399	733156.096	698391.399	733156.096	Required	
FFP112	698394.744	733144.611	698394.744	733144.611	Required	
FFP111	698405.750	733123.648	698405.750	733123.648	Required	
FFP110	698447.574	733052.667	698447.574	733052.667	Required	
FFP109	698451.639	733040.843	698451.639	733040.843	Required	
FFP108	698450.720	733017.496	698450.720	733017.496	Required	
FFP107	698442.906	732990.509	698442.906	732990.509	Required	
FFP106	698419.658	732909.796	698419.658	732909.796	Required	
FFP105	698400.247	732842.240	698400.247	732842.240	Required	
FFP104	698389.086	732828.716	698389.086	732828.716	Required	
FFP103	698369.446	732824.414	698369.446	732824.414	Required	
FFP102-6	698430.024	732994.451	698430.024	732994.451	Required	
FFP102-5	698388.476	733006.262	698388.476	733006.262	Required	
FFP102-4	698381.392	732982.695	698381.392	732982.695	Required	
FFP102-3	698364.954	732925.616	698364.954	732925.616	Required	

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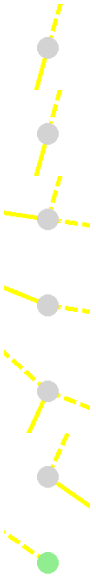
Manhole Schedules for FS_1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
FFP102-2	698347.977	732866.596	698347.977	732866.596	Required	
FFP102-1	698341.414	732842.874	698341.414	732842.874	Required	
FFP102	698337.552	732829.057	698337.552	732829.057	Required	
FFP101	698299.908	732834.771	698299.908	732834.771	Required	
FFP2	698280.353	732842.621	698280.353	732842.621	Required	
FFP1	698276.935	732835.086	698276.935	732835.086	Required	
FFP0	698281.437	732831.946			No Entry	



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PIPELINE SCHEDULES for FS_1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	o	150	FFP13	55.485	54.335	1.000	Open Manhole	1200
F1.001	o	150	FFP12	55.594	54.163	1.281	Open Manhole	1200
F2.000	o	150	FFP11-1	55.225	53.983	1.092	Open Manhole	1200
F1.002	o	150	FFP11	55.476	53.836	1.490	Open Manhole	1200
F1.003	o	150	FFP10	55.767	53.330	2.287	Open Manhole	1200
F3.000	o	150	FFP9-3	55.738	54.388	1.200	Open Manhole	1200
F4.000	o	150	FFP9-2-1	55.933	54.373	1.410	Open Manhole	1200
F3.001	o	150	FFP9-2	56.006	53.905	1.951	Open Manhole	1200
F3.002	o	150	FFP9-1	55.864	53.760	1.954	Open Manhole	1200
F3.003	o	150	F10	55.730	53.546	2.034	Open Manhole	1200
F1.004	o	225	FFP9	55.777	53.257	2.295	Open Manhole	1200
F5.000	o	150	FFP8-3	55.568	54.215	1.203	Open Manhole	1200
F6.000	o	150	FFP8-2-1	55.827	54.481	1.196	Open Manhole	1200
F5.001	o	150	FFP8-2	55.533	53.658	1.725	Open Manhole	1200
F5.002	o	150	FFP8-1	55.868	53.351	2.367	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	18.914	110.0	FFP12	55.594	54.163	1.281	Open Manhole	1200
F1.001	48.900	150.0	FFP11	55.476	53.837	1.489	Open Manhole	1200
F2.000	7.610	51.8	FFP11	55.476	53.836	1.490	Open Manhole	1200
F1.002	75.910	150.0	FFP10	55.767	53.330	2.287	Open Manhole	1200
F1.003	2.639	150.0	FFP9	55.777	53.312	2.315	Open Manhole	1200
F3.000	44.960	93.1	FFP9-2	56.006	53.905	1.951	Open Manhole	1200
F4.000	15.847	33.8	FFP9-2	56.006	53.904	1.952	Open Manhole	1200
F3.001	21.616	149.0	FFP9-1	55.864	53.760	1.954	Open Manhole	1200
F3.002	38.646	180.6	F10	55.730	53.546	2.034	Open Manhole	1200
F3.003	16.471	77.0	FFP9	55.777	53.332	2.295	Open Manhole	1200
F1.004	67.989	189.1	FFP8	55.823	52.897	2.700	Open Manhole	1200
F5.000	34.147	61.3	FFP8-2	55.533	53.658	1.725	Open Manhole	1200
F6.000	39.269	47.7	FFP8-2	55.533	53.658	1.725	Open Manhole	1200
F5.001	39.968	130.2	FFP8-1	55.868	53.351	2.367	Open Manhole	1200
F5.002	37.525	99.8	FFP8	55.823	52.975	2.698	Open Manhole	1200

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PIPELINE SCHEDULES for FS_1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.005	o	225	FFP8	55.823	52.897	2.701	Open Manhole	1200
F7.000	o	150	FFP7-2	55.299	53.949	1.200	Open Manhole	1200
F7.001	o	150	FFP7-1	55.839	53.107	2.582	Open Manhole	1200
F1.006	o	225	FFP7	56.035	52.538	3.272	Open Manhole	1200
F8.000	o	225	FFP6-1	56.276	53.851	2.200	Open Manhole	1200
F1.007	o	225	FFP6	56.098	52.508	3.365	Open Manhole	1200
F1.008	o	225	FFP5	56.023	52.252	3.546	Open Manhole	1200
F1.009	o	225	FFP4	55.527	51.372	3.930	Open Manhole	1200
F9.000	o	150	FFP3-5	56.434	55.084	1.200	Open Manhole	1200
F9.001	o	150	FFP3-4	55.475	54.125	1.200	Open Manhole	1200
F9.002	o	150	FFP3-3	55.731	53.364	2.217	Open Manhole	1200
F9.003	o	150	FFP3-2	55.550	52.801	2.599	Open Manhole	1200
F9.004	o	150	FFP3-1	55.858	52.405	3.303	Open Manhole	1200
F1.010	o	225	FFP3	55.734	50.975	4.534	Open Manhole	1200
F10.000	o	150	FFP119	55.171	54.021	1.000	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.005	71.534	199.5	FFP7	56.035	52.538	3.272	Open Manhole	1200
F7.000	50.552	60.0	FFP7-1	55.839	53.107	2.582	Open Manhole	1200
F7.001	18.662	38.3	FFP7	56.035	52.620	3.265	Open Manhole	1200
F1.006	7.285	200.0	FFP6	56.098	52.502	3.371	Open Manhole	1200
F8.000	42.894	80.0	FFP6	56.098	53.315	2.558	Open Manhole	1200
F1.007	15.293	59.7	FFP5	56.023	52.252	3.546	Open Manhole	1200
F1.008	75.833	86.2	FFP4	55.527	51.372	3.930	Open Manhole	1200
F1.009	51.667	130.3	FFP3	55.734	50.975	4.533	Open Manhole	1200
F9.000	51.433	53.6	FFP3-4	55.475	54.125	1.200	Open Manhole	1200
F9.001	83.742	110.0	FFP3-3	55.731	53.364	2.217	Open Manhole	1200
F9.002	61.927	110.0	FFP3-2	55.550	52.801	2.599	Open Manhole	1200
F9.003	32.234	81.4	FFP3-1	55.858	52.405	3.303	Open Manhole	1200
F9.004	6.929	62.4	FFP3	55.734	52.294	3.290	Open Manhole	1200
F1.010	5.332	148.1	FFP2	55.606	50.939	4.442	Open Manhole	1200
F10.000	21.153	59.9	FFP118	55.306	53.668	1.488	Open Manhole	1200

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PIPELINE SCHEDULES for FS_1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F11.000	o	150	FFP118-1	55.457	54.107	1.200	Open Manhole	1200
F10.001	o	150	FFP118	55.306	53.668	1.488	Open Manhole	1200
F10.002	o	150	FFP117	55.316	53.517	1.649	Open Manhole	1200
F12.000	o	150	FFP116-1	55.276	53.844	1.282	Open Manhole	1200
F10.003	o	150	FFP116	55.238	53.270	1.818	Open Manhole	1200
F10.004	o	225	FFP115	55.103	52.919	1.959	Open Manhole	1200
F10.005	o	225	FFP114	54.708	52.134	2.349	Open Manhole	1200
F13.000	o	150	FFP113-4	54.290	53.040	1.100	Open Manhole	1200
F13.001	o	150	FFP113-3	53.990	52.740	1.100	Open Manhole	1200
F13.002	o	150	FFP113-2	54.329	52.456	1.723	Open Manhole	1200
F13.003	o	150	FFP113-1	54.521	52.236	2.135	Open Manhole	1200
F10.006	o	225	FFP113	54.756	51.423	3.108	Open Manhole	1200
F10.007	o	225	FFP112	55.250	50.918	4.107	Open Manhole	1200
F10.008	o	225	FFP111	55.446	50.800	4.421	Open Manhole	1200
F10.009	o	225	FFP110	57.108	50.388	6.495	Open Manhole	1200
F10.010	o	300	FFP109	57.419	50.250	6.869	Open Manhole	1200
F10.011	o	300	FFP108	57.639	50.139	7.200	Open Manhole	1200
F10.012	o	300	FFP107	57.776	50.011	7.465	Open Manhole	1200
F10.013	o	300	FFP106	57.183	49.629	7.254	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F11.000	22.494	51.2	FFP118	55.306	53.668	1.488	Open Manhole	1200
F10.001	21.141	140.0	FFP117	55.316	53.517	1.649	Open Manhole	1200
F10.002	38.563	156.1	FFP116	55.238	53.270	1.818	Open Manhole	1200
F12.000	18.306	31.9	FFP116	55.238	53.270	1.818	Open Manhole	1200
F10.003	41.509	150.0	FFP115	55.103	52.993	1.960	Open Manhole	1200
F10.004	39.269	50.0	FFP114	54.708	52.134	2.349	Open Manhole	1200
F10.005	33.224	46.7	FFP113	54.756	51.423	3.108	Open Manhole	1200
F13.000	33.195	110.7	FFP113-3	53.990	52.740	1.100	Open Manhole	1200
F13.001	42.048	148.1	FFP113-2	54.329	52.456	1.723	Open Manhole	1200
F13.002	21.991	100.0	FFP113-1	54.521	52.236	2.135	Open Manhole	1200
F13.003	26.177	50.0	FFP113	54.756	51.712	2.894	Open Manhole	1200
F10.006	11.962	23.7	FFP112	55.250	50.918	4.107	Open Manhole	1200
F10.007	23.676	200.0	FFP111	55.446	50.800	4.421	Open Manhole	1200
F10.008	82.387	200.0	FFP110	57.108	50.388	6.495	Open Manhole	1200
F10.009	12.503	198.5	FFP109	57.419	50.325	6.869	Open Manhole	1200
F10.010	23.365	210.5	FFP108	57.639	50.139	7.200	Open Manhole	1200
F10.011	28.095	219.5	FFP107	57.776	50.011	7.465	Open Manhole	1200
F10.012	83.995	219.9	FFP106	57.183	49.629	7.254	Open Manhole	1200
F10.013	70.289	229.7	FFP105	56.608	49.323	6.985	Open Manhole	1200

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PIPELINE SCHEDULES for FS_1

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F10.014	o	300	FFP105	56.608	49.323	6.985	Open Manhole	1200
F10.015	o	300	FFP104	56.474	49.247	6.927	Open Manhole	1200
F10.016	o	300	FFP103	56.312	49.160	6.852	Open Manhole	1200
F14.000	o	150	FFP102-6	57.569	56.219	1.200	Open Manhole	1200
F14.001	o	150	FFP102-5	56.788	55.438	1.200	Open Manhole	1200
F14.002	o	150	FFP102-4	56.479	55.105	1.224	Open Manhole	1200
F14.003	o	150	FFP102-3	56.737	54.681	1.906	Open Manhole	1200
F14.004	o	150	FFP102-2	56.239	53.548	2.541	Open Manhole	1200
F14.005	o	150	FFP102-1	55.813	50.940	4.723	Open Manhole	1200
F10.017	o	300	FFP102	56.053	49.022	6.731	Open Manhole	1200
F10.018	o	300	FFP101	55.762	48.863	6.599	Open Manhole	1200
F1.011	o	300	FFP2	55.606	48.775	6.531	Open Manhole	1200
F1.012	o	300	FFP1	55.470	48.720	6.450	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F10.014	17.534	230.7	FFP104	56.474	49.247	6.927	Open Manhole	1200
F10.015	20.105	231.1	FFP103	56.312	49.160	6.852	Open Manhole	1200
F10.016	32.231	233.6	FFP102	56.053	49.022	6.731	Open Manhole	1200
F14.000	43.195	55.3	FFP102-5	56.788	55.438	1.200	Open Manhole	1200
F14.001	24.609	73.9	FFP102-4	56.479	55.105	1.224	Open Manhole	1200
F14.002	59.399	140.1	FFP102-3	56.737	54.681	1.906	Open Manhole	1200
F14.003	61.413	150.2	FFP102-2	56.239	54.272	1.817	Open Manhole	1200
F14.004	24.613	79.9	FFP102-1	55.813	53.240	2.423	Open Manhole	1200
F14.005	14.347	80.0	FFP102	56.053	50.761	5.142	Open Manhole	1200
F10.017	38.074	239.5	FFP101	55.762	48.863	6.599	Open Manhole	1200
F10.018	21.072	239.5	FFP2	55.606	48.775	6.531	Open Manhole	1200
F1.011	8.274	150.4	FFP1	55.470	48.720	6.450	Open Manhole	1200
F1.012	5.489	150.0	FFP0	55.523	48.683	6.539	Open Manhole	1800

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Appendix H : Topographical Survey

LAND SURVEYS
22 Mellifont Avenue, Dun Laoghaire, Co. Dublin.
Ph: 2805212 Fax: 2302535 info@landsurveys.ie

Site at: Donaghcumper, Celbridge
Co. Kildare

Client: DBFL Consulting Engineers

Scale:	1:500 (A1)
Contour:	0.5m Interval
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Sheet 1 of 10 (A1)

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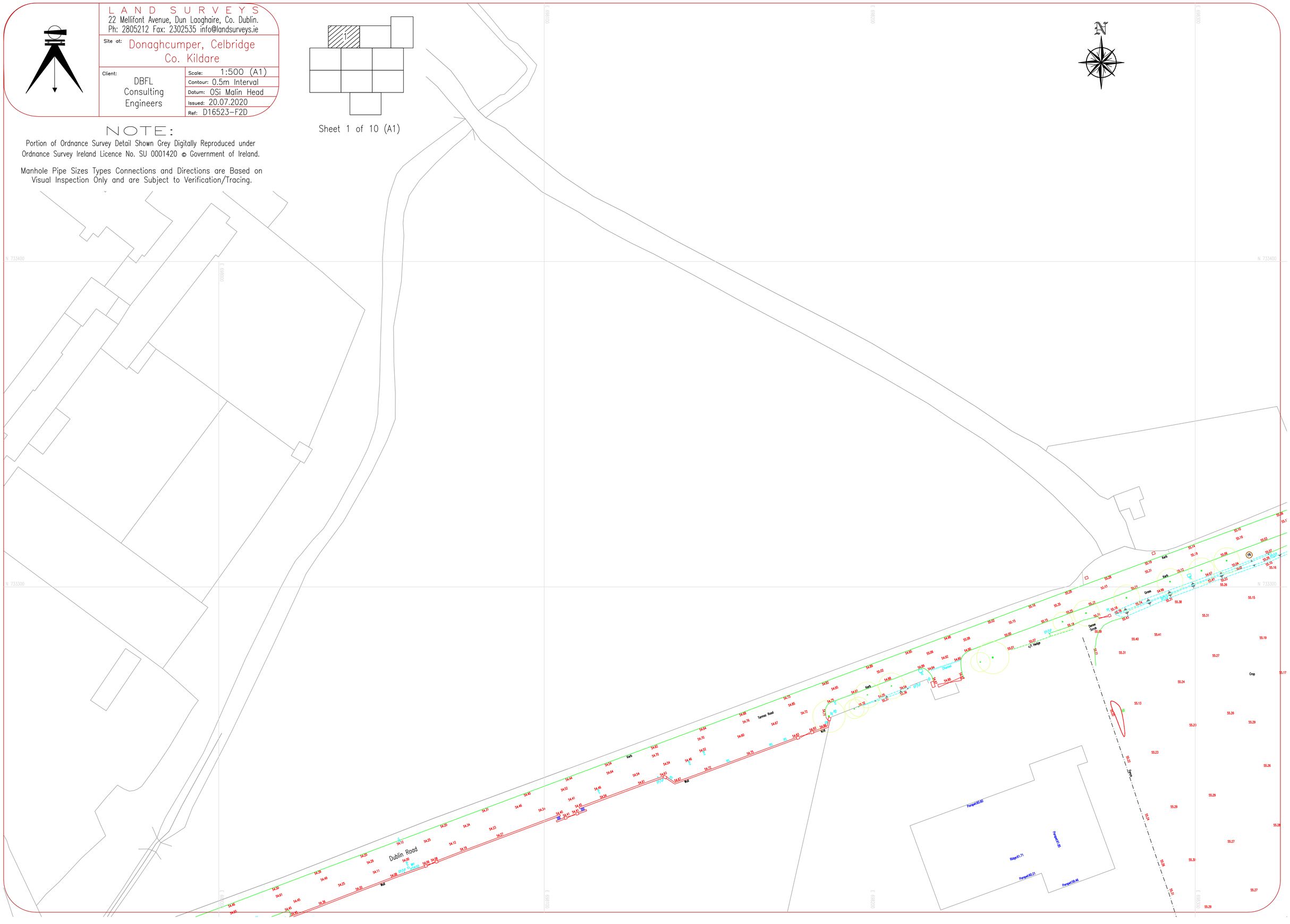

L A N D S U R V E Y S
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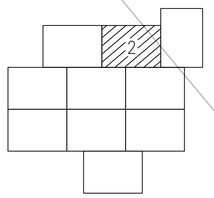

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E 698800

E 698900

N 733500

N 733400

N 733300

Dublin Road

Kerb

Tarmac Road

Paving

Concrete

Post & Wire

c/l Hedge

Line of Trees

Wall

Gravel

Tarmac Road

Railing

Kerb

Timber Fence

Timber Fence

Sheet 3 of 10 (A1)

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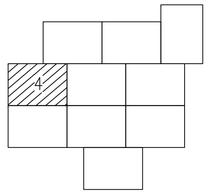

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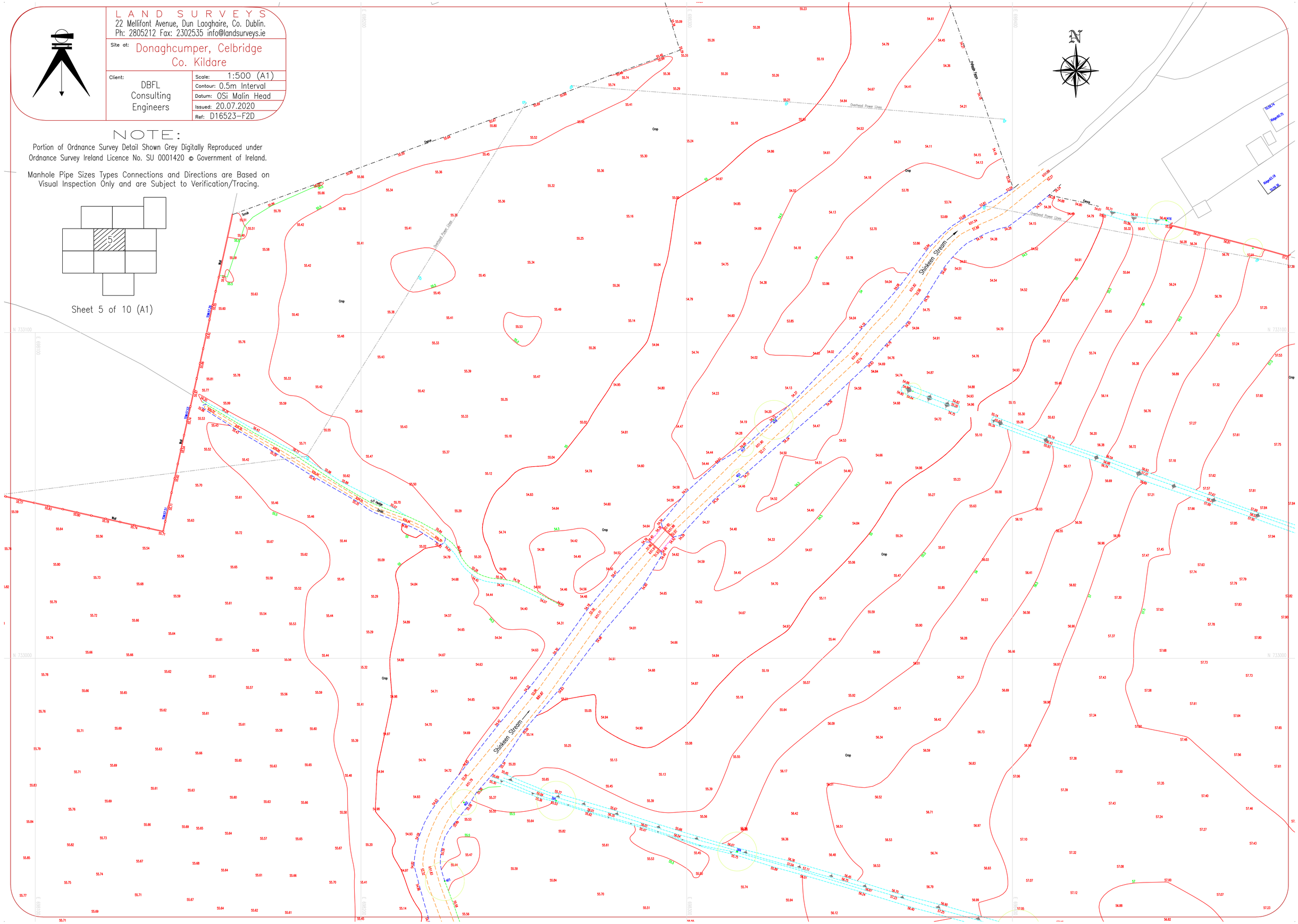

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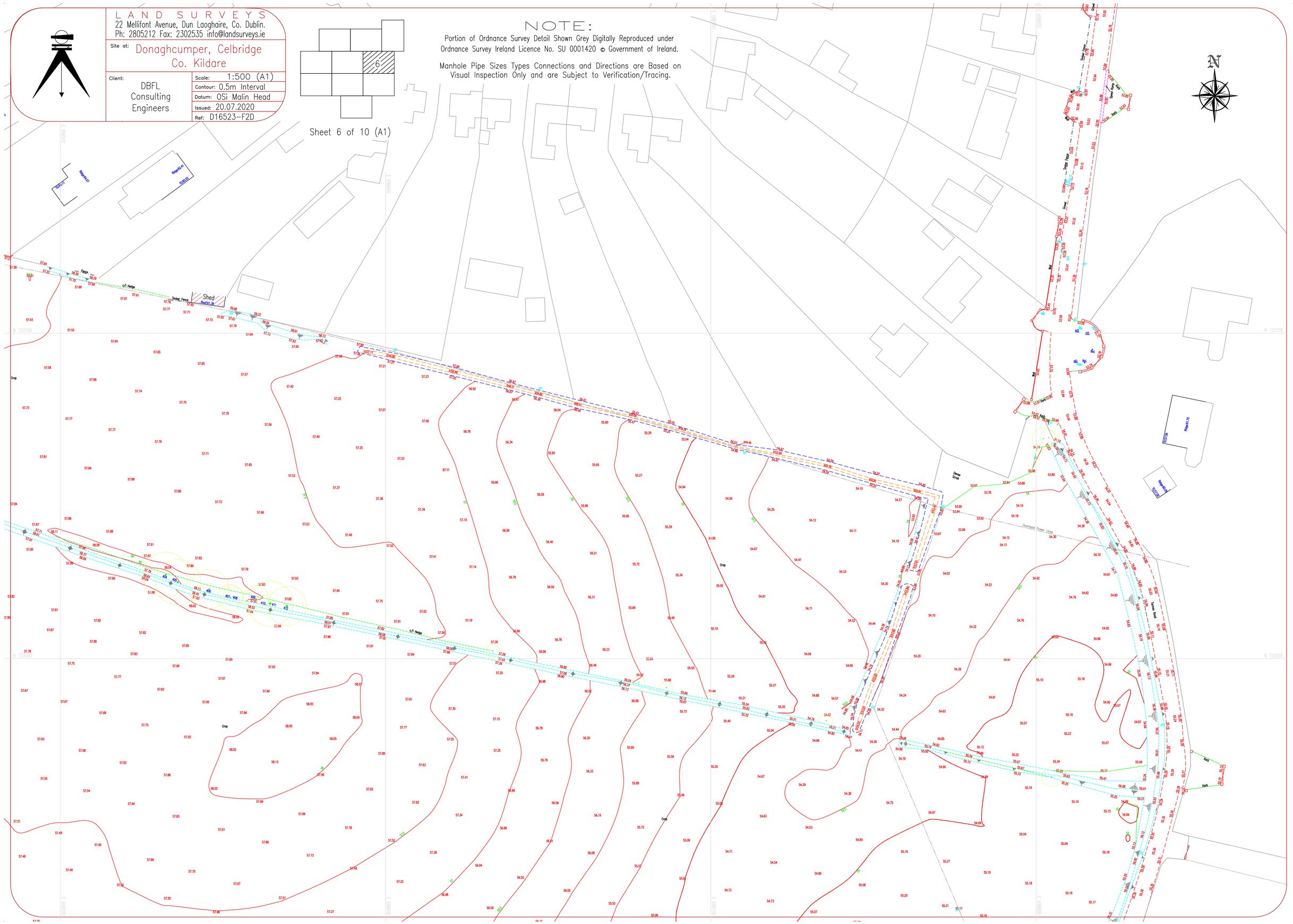
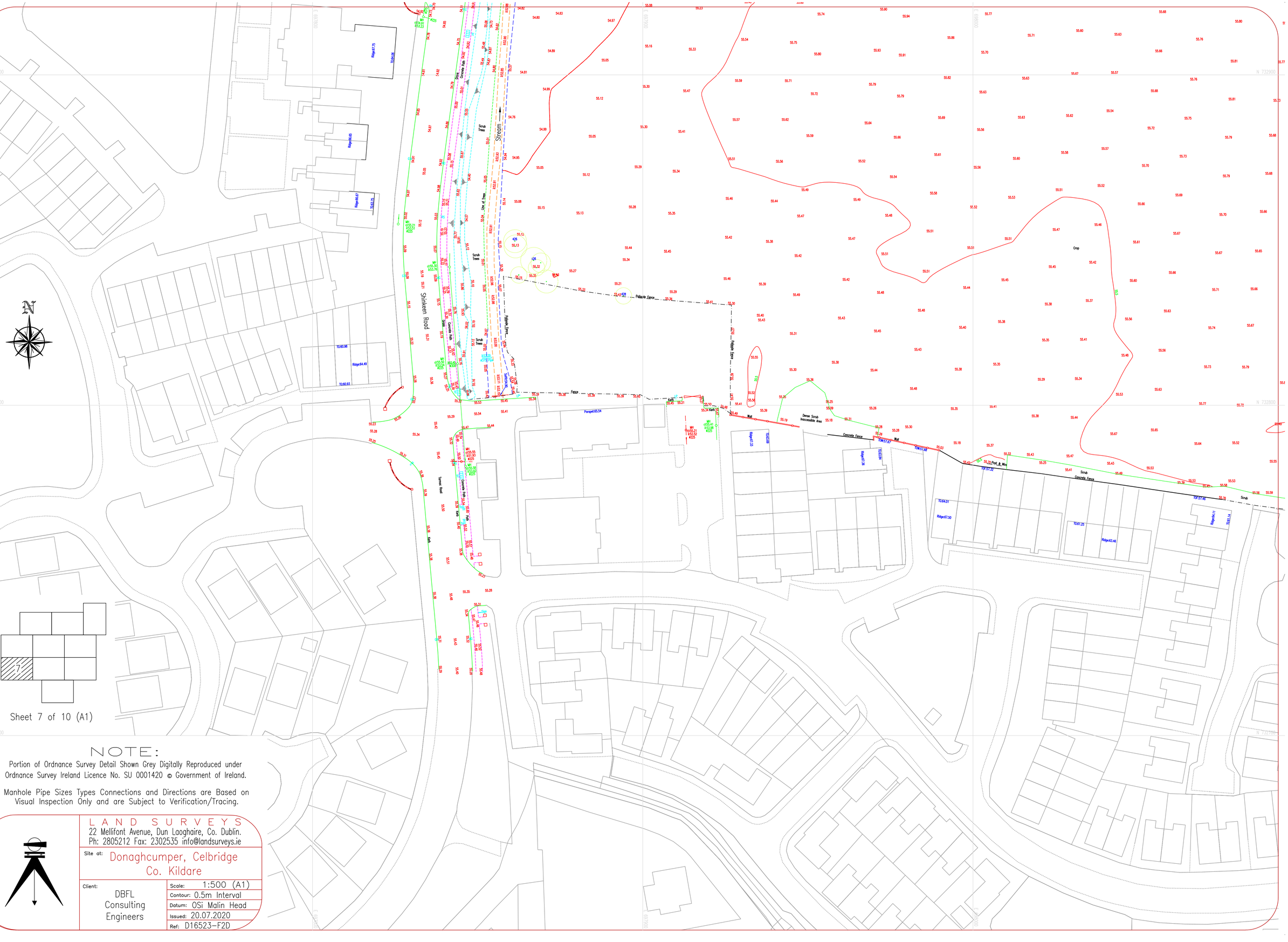

N
E 689600
E 689650
N 733100
N 733050
N 733000
Fence
s/l Hedge
Timber Fence
Shed
Ridge 61.30
Ridge 61.41
Ridge 61.70
Ridge 61.97
Ridge 62.07
Crop
Dense Scrub
Overhead Power Lines
Timber Post
Timber Fence
Kerb
Bollard
Bollard
Bollard



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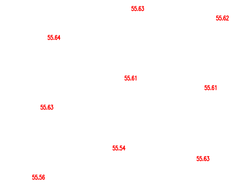

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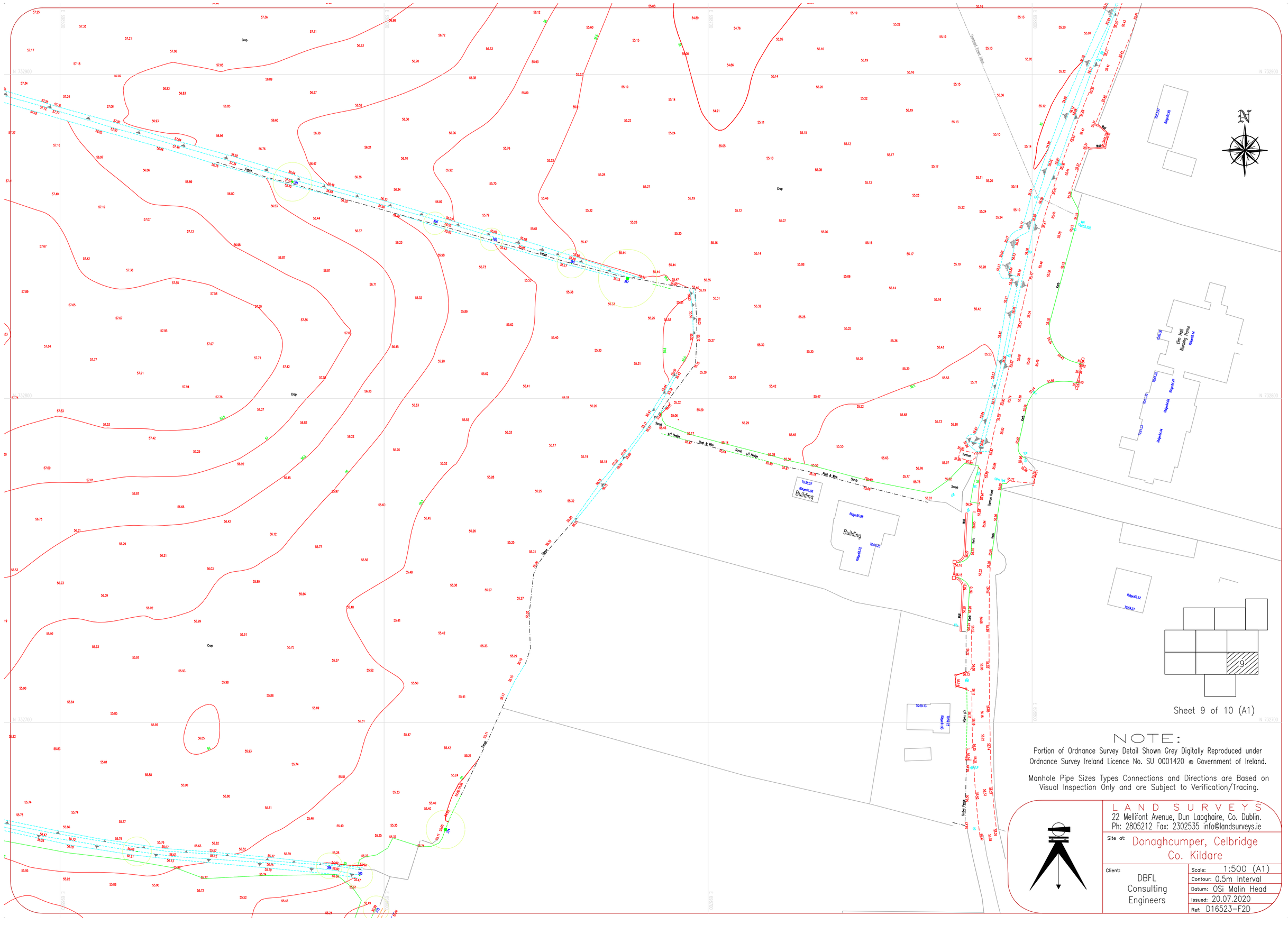

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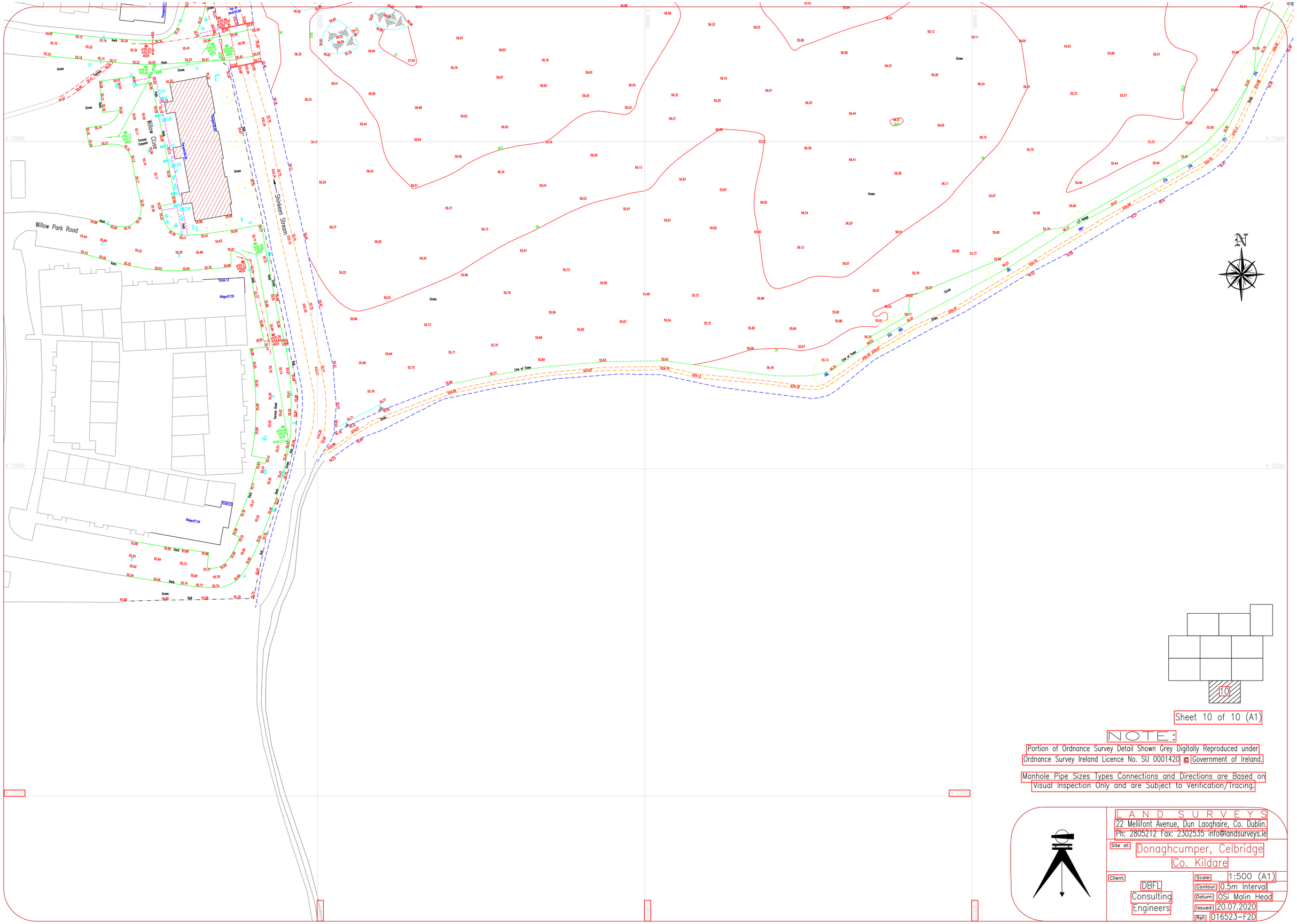

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Ref: D16523-F2D

Appendix I : SI Over Proposed Development

IGSL Limited

HWBC Ltd.
DBFL Consulting Engineers

Ballyoulster
Celbridge,
Co. Kildare

Ground Investigation Report

Report No. 23679

January 2022

Report

M7 Business Park
Naas
Co. Kildare
Ireland

T: +353 (45) 846176
E: info @igsl.ie
W: www.igsl.ie

Project: Ballyoulster, Celbridge

Project No. 23679

Revision	**Date**	**Title**		
Rev 0	21/01/2022	Preliminary Ground Investigation Report		
	Copies	Document Format	Prepared By	Reviewed By
		PDF	David Green	Brian Green
	To	DBFL Consulting Engineers		
Revision	**Date**	**Title**		
Rev 0	19/5/2022	Ground Investigation Report		
	Copies	Document Format	Prepared By	Reviewed By
		PDF	David Green	Brian Green
	To	DBFL Consulting Engineers		
Revision	**Date**	**Title**		
	Copies	Document Format	Prepared By	Reviewed By
	To			
Revision	**Date**	**Title**		
	Copies	Document Format	Prepared By	Reviewed By
	To			

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2.5 Groundwater Monitoring
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3.0 Laboratory Testing (Geotechnical)

4.0 Laboratory Testing (Environmental)

5.0 Discussion

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5.2 Pavement Design
5.3 Soakaway Requirements
5.4 Environmental Issues

6.0 References

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Waste Classification Report (O'Callaghan Moran)

FOREWORD

The following conditions and notes on the geotechnical site investigation procedures should be read in conjunction with this report.

Standards

The ground investigation works for this project have been carried out by IGSL in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as BS 5930 (1999), BS 1377 (Parts 1 to 9) and Engineers Ireland Specification & Related Documents for Ground Investigation in Ireland (2006). A new National Annex for use in the Republic of Ireland is currently in circulation for comment and will be adopted in the near future. In the meantime, the following Irish (IS) and European Standards or Norms are referenced:

- IS EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing
- IS EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- IS EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- IS EN ISO 14688-2:2004 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles
- IS EN ISO 14689-1:2004 Geotechnical Investigation and Testing - Identification & Classification of Rock, Part 1: Identification & Description

Reporting

Recommendations made and opinions expressed in this report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held by IGSL Ltd for ground conditions between exploratory hole locations.

The engineering logs provide ground profiles and configuration of strata relevant to the investigation depths achieved and caution should be taken when extrapolating between exploratory points. No liability is accepted for ground conditions extraneous to the investigation points.

This report has been prepared for DBFL Consulting Engineers and the information should not be used without prior written permission. The recommendations developed in this report specifically relate to the proposed development. IGSL Ltd accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

In-Situ Testing

Standard penetration tests were conducted strictly in accordance with Section 4.6 of IS EN 1997-2:2007. The SPT equipment (hammer energy test) has been calibrated in accordance with EN ISO 22476-3:2005 and the Energy Ratio (E_r). A calibration certificate is available upon request. The E_r is defined as the ratio of the actual energy E_{meas} (measured energy during calibration) delivered to the drive weight assembly into the drive rod below the anvil, to the theoretical energy (E_{theor}) as calculated from the drive weight assembly. The measured number of blows (N) reported on the engineering logs are uncorrected. In sands, the energy losses due to rod length and the effect of the overburden pressure should be taken into account (see IS EN ISO 22476-3:2005).

Groundwater

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level. Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are

subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc.

Engineering Logging

Soil and rock identification has been based on the examination of the samples recovered and conforms with IS EN ISO 14688-1:2002 and IS EN ISO 14689-1:2004. Rock weathering classification conforms to IS EN ISO 14689-1:2003 while discontinuities (bedding planes, joints, cleavages, faults etc) are classified in accordance with 4.3.3 of IS EN ISO 14689-1:2003. Rock mechanical indices (TCR, SCR, RQD) are defined in accordance with IS EN ISO 22475-1:2006.

Retention of Samples

Samples shall be retained for a period of 60 days following approval of the final factual report, as detailed in the Scope of Works.

1.0 Introduction

It is proposed to construct a residential development at Ballyoulster, Celbridge, County Kildare.

An investigation of ground conditions was undertaken to relate the ground conditions to foundation requirements for the proposed structures and pavements. Also required was information on groundwater conditions, and recovery of samples for environmental analysis.

Fieldwork for this investigation entailed the following:

- Dynamic probing techniques were employed in 24 locations to obtain a resistance profile.
- Trial pits were excavated in 25 locations to permit close examination of the upper soils.
- Rotary drilling and coring techniques were employed in 8 locations, primarily to form monitor wells
- Plate Bearing Tests were performed in 8 locations to obtain a measure of CBR values.
- Infiltration testing was performed in selected locations to assess the suitability of the sub-soils for soakaway purposes.
- Standpipes were installed to facilitate monitoring of groundwater levels and gas emissions
- Data loggers were installed in all coreholes to permit continuous recording of groundwater levels

This report presents an assessment of the ground conditions with respect to the proposed development.

The environmental elements of the investigation were interpreted by O'Callaghan Moran and discussed in their Waste Characterisation Assessment, which is presented under separate cover.

2.0 Ground Conditions

2.1 Dynamic Probing

The dynamic probe utilised by IGSL Ltd complies with the requirements of ISO 22476-2: 2005+A1: 2011 – Geotechnical Investigation and testing – Field testing - Part 2: Dynamic probing. DPH probing comprises a 50 kg drop weight, 500mm drop height and a 43.7mm diameter (90°) cone.

In accordance with the standards, the number of blows required to drive the probe through each 100mm increment of penetration is recorded. Probing is generally terminated when blow counts, N100 values, exceed 25, in order to avoid damage to equipment. Detailed probe records are provided on which the blow counts are recorded both numerically and graphically.

Probe results are used primarily in conjunction with known information on soil composition and stratification, to define more accurately the soil profile, and to detect any soft or loose zones.

Most of the probes recorded high resistance from nominal depth, and, in some locations, refusal was recorded within a metre of ground level. Notable exceptions were DP01 to DP05 where zones of low to moderate resistance were detected within the upper 1.5 to 2.0 metres.

2.2 Trial Pits

Trial pits were excavated in the locations indicated on the site plan, while the descriptions and depths of the soils encountered are shown on the trial pit records enclosed in Appendix 2. Also shown o these records are the depths at which samples were recovered, and the groundwater conditions observed during the course of excavation operations.

The trial pits revealed mottled brown and grey sandy gravelly clay, initially in a soft to firm condition, becoming firm to stiff with depth. The soils became more structured with depth, and graded to angular to sub-angular gravel, cobbles and boulders of limestone. Refusal depths varied from place to place depending on the degree of weathering. For example, a maximum depth of 3.0 metres was achieved by TP23, while refusal was recorded at a depth of 0.8 metres in TP22. No groundwater was observed to the excavated depths.

2.3 Rotary Drilling and Coring

Rotary coreholes RC01 to RC08 were drilled in order to investigate for the presence of bedrock and to form wells for groundwater and gas monitoring.

A tracked Beretta BT-44 coring rig was used. Symmetrix open hole techniques were used to advance through the overburden deposits, reverting to rotary coring in bedrock. It is noted that Symmetrix drilling produces highly pulverised drill returns and therefore, soil descriptions based on these returns are very approximate.

Rotary coring of bedrock was carried out using an air/mist flush to maximise recovery. Cores of 78 mm diameter were recovered and placed securely in wooden storage boxes. The recovered core was inspected by a qualified engineering geologist and logged in detail at IGSL's laboratory.

All cores were labelled and photographed for inclusion in the report. Photographs are presented digitally for ease of browsing and to permit close examination at high resolution. Corehole records and photographs are included in Appendix 3 of this report.

The coring records are presented in Appendix 3 and show the descriptions and depths of the soils encountered and the ground water depths observed on completion of coring operations. The findings are summarised in Table 1.

The records also include a detailed description of the bedrock including the rock structure, strength, and degree of weathering. In accordance with BS 5930: 2015, the records include the total core recovery (TCR), solid core recovery (SCR) and the rock quality designation (RQD). Also shown graphically is the fracture spacing.

Location	Depth to bedrock (m bgl)	Final Depth (mbgl)	Depth to water (m bgl)
RC01	1.30	4.30	3.40
RC02	3.00	6.00	5.60
RC03	2.50	5.50	5.10
RC04	no bedrock	8.00	3.40
RC05	4.00	7.00	2.80
RC06	2.60	5.60	2.40
RC07	no bedrock	8.00	2.40
RC08	4.00	7.00	3.20

Table 1 – Summary of Rock Drilling and Coring

The rock is described as grey-black, strong, becoming locally weak, medium to thinly bedded, fine grained limestone with subordinate shaley mudstone. A measure of the strength of the bedrock was obtained from Point Load Index tests as described in Section 3.4.

Standard Penetration Tests (SPT) were undertaken within the overburden soils and these are summarised on Table 2.

Corehole No.	SPT Test Depth (m bgl)	SPT Blowcounts (per 75 mm)	SPT "N" Value
RC01	1.0	9-17-21-26-25-R	>100
RC02	1.0	11-8-6-4-4-5	19
	2.0	4-5-7-6-6-9	28
	3.0	R	R
RC03	1.0	3-5-4-8-14-29	55
	2.0	7-14-19-20-28-23	90
RC04	1.0	3-4-4-3-4-5	16
	2.0	4-9-11-18-21-22	62
	3.0	5-8-9-24-27-25	85
	4.0	R	R
	5.0	R	R
	6.0	14-23-25-R	R
	7.0	7-R	R
	8.0	21-R	R
RC05	1.0	3-3-3-3-3-3	12
	2.0	4-9-5-7-7-7	26
	3.0	10-10-17-14-11-8	50
	4.0	R	R
RC06	1.0	3-4-4-4-5-6	19
	2.0	2-12-6-9-9-9	33
RC07	1.0	9-17-13-15-17-17	62
	2.0	4-6-9-5-7-6	27
	3.0	3-4-3-4-4-7	18
	4.0	3-4-19-R	R
	5.0	6-9-10-17-25-R	R
	7.0	6-19-26-18-17-20	81
	8.0	8-10-12-14-14-15	55
RC08	1.0	6-12-17-16-24-21	78
	2.0	7-10-14-17-15-14	62
	3.0	9-14-28-32-21-23	104
	4.0	25-R	R

Table 2 – Summary of SPT Results

Photo 1 shows the core recovery of the upper Limestone at RC01 (1.3 – 4.3 m). The degree of weathering varies significantly, with heavily fractured material evident at the bedrock horizon and below approximately 2.5 m BGL.

Photo 1 – Core recovery at RC01 (1.3 to 4.3 m BGL)

Photo 2 shows the core recovery of the upper bedrock at RC06 (2.6 – 5.6m). When compared to RC01, the recovery is considerably less weathered throughout and the degree of fracturing is significantly reduced.

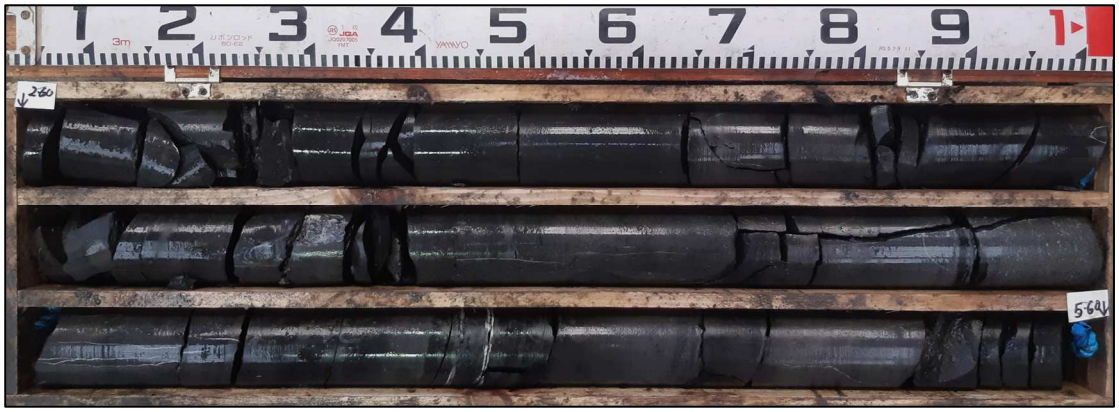


Photo 2 – Core recovery at RC06 (2.6 – 5.6 m BGL)

2.4 Plate Bearing Tests

Plate bearing tests were performed in eight locations to obtain a measure of the CBR values. A 450 mm diameter plate was used, and tests were performed at a depth of 0.35 metres below existing ground level. Tests were performed in accordance with BS 1377 Part 9: 1990. “In-situ Tests”. The incremental loading test (4.1.6.4.2) was used. The maximum applied load was estimated on the basis of obtaining an accumulative displacement of at least 1.25 mm. The load was then applied in five approximately equal increments to the design load. To measure recovery the load was removed in three increments.

A second phase of loading and unloading was performed to assess the benefits of further compaction. The settlement under each increment was measured against time until movement had effectively ceased and the results are presented as graphs of applied pressure against settlement. Calculation of Modulus of Sub-grade Reaction (k) and

CBR values are in accordance with NRA HD25-26/10 Volume7: Pavement Design and Maintenance.

The test records from the initial and reload stages are enclosed in Appendix 4, while the results are summarised in Table 3 below.

Location	Depth (m bgl)	Soil Type	CBR%	
			First Cycle	Reload Cycle
PBT01	0.35	Sandy gravelly CLAY	1.9	2.2
PBT02	0.35	Sandy gravelly CLAY	1.9	2.0
PBT03	0.35	Sandy gravelly CLAY	1.1	1.6
PBT04	0.35	Sandy gravelly CLAY	0.9	1.3
PBT05	0.35	Sandy gravelly CLAY	2.2	3.7
PBT06	0.35	Sandy gravelly CLAY	1.3	3.4
PBT07	0.35	Sandy gravelly CLAY	2.4	7.8
PBT08	0.35	Sandy gravelly CLAY	7.7	24.5

Table 3 – Summary of Plate Bearing Tests

2.5 Infiltration Testing

Infiltration tests were performed in accordance with BRE Digest 365 'Soakaway Design'. Test locations are shown as SA01 to SA24 on the site plan.

To obtain a measure of the infiltration rate of the sub-soils, water is poured into the test pit, and records taken of the fall in water level against time. This procedure is repeated twice more to ensure saturation of the sub-soils. Normally the results for the final stage of testing, following the saturation periods, are used for soakaway design purposes.

The tests were performed at the refusal depths, and the results for the final stages of each test are enclosed in Appendix 5.

2.6 Groundwater Monitoring

Standpipes were installed in eight locations to facilitate monitoring of water levels.

The construction details of the installations are shown in Table 4. Also shown are the most recent set of groundwater levels as recorded on 13th January 2022.

Location	Depth (m bgl)	Gravel pack	Bentonite Seal	Concrete Cap	Response Zone (50mm)	Depth to water 13/01/2022 (m bgl)
RC01	4.3	4.3 to 1.0	1.0 to 0.5	0.5 to GL	4.3 to 1.0	2.67
RC02	6.0	6.0 to 1.0	1.0 to 0.5	0.5 to GL	6.0 to 1.0	0.54
RC03	5.5	5.5 to 1.0	1.0 to 0.5	0.5 to GL	5.5 to 1.0	1.53
RC04	8.0	8.0 to 1.0	1.0 to 0.5	0.5 to GL	8.0 to 1.0	2.60
RC05	7.0	7.0 to 1.0	1.0 to 0.6	0.5 to GL	7.0 to 1.0	2.02
RC06	5.6	5.6 to 1.0	1.0 to 0.7	0.5 to GL	5.6 to 1.0	1.40
RC07	8.0	8.0 to 1.0	1.0 to 0.8	0.5 to GL	8.0 to 1.0	1.88
RC08	7.0	7.0 to 1.0	1.0 to 0.9	0.5 to GL	7.0 to 1.0	3.95

Table 4 – Summary of Groundwater Monitoring (13/01/2022)

Data loggers were installed in coreholes RC01 to RC08 in order to continuously monitor the variations in the groundwater level with time. The loggers remained in place between 20th January and 9th May 2022.

The data loggers were interrogated on three dates up to 9th May 2022 and a plot of Depth to Groundwater vs Time was generated for each time interval. These plots are presented in Appendix 6.

The plots show that the depth to water was mostly in the range 1.5 to 2.5 m BGL during the monitoring period. However, a sharp rise in water levels was observed in mid to late February, attributed to exceptionally high rainfall intensity. During this period, water levels rose to less than a metre below ground level in 4 locations (RC02, 03, 06 and 08).

2.7 Gas Monitoring

The standpipes were fitted with rubber bungs to permit gas monitoring. Gas readings were recorded on 1st December 2021 and 13th January 2022 using a GA5000 infra-red gas detector. The most recent set of results are shown on Table 5.

Location	Groundwater Depth (m BGL)	Carbon Dioxide (%)	Methane (%)	Oxygen (%)	Barometric Pressure (mBar)
RC01	2.67	1.5	0.0	16.8	1034
RC02	0.54	0.1	0.0	19.1	1034
RC03	1.53	1.8	0.0	14.5	1034
RC04	2.60	2.1	0.0	14.2	1034
RC05	2.02	0.1	0.0	20.2	1034
RC06	1.40	0.1	0.0	22.2	1034
RC07	1.88	0.0	0.0	20.5	1034
RC08	3.95	0.2	0.0	20.1	1034

Table 5 – Summary of Gas Monitoring (01/12/2021)

3.0 Laboratory Testing (Geotechnical)

3.1 Particle Size Distributions

Grading curves for selected samples suggest that the sub-soils are generally well-graded with a fines content of approximately 50%. However, a sample from TP23 shows the presence of finer material.

3.2 Index Properties

The results of plastic and liquid limit tests generally classify the fine material as clay of low to medium plasticity.

3.3 Chemical analysis

The results of chemical testing showed low concentrations of soluble sulphates with a maximum concentration of 0.16 g/l SO_4 recorded. In addition, the pH values (7.8 to 8.9) indicated near neutral conditions.

Four samples of coarse granular material (weathered bedrock) as recovered from the base of trial pits TP05, 11, 15 and 24 were tested for Total Sulphur and Acid Soluble Sulphate in accordance with EN 1744. The tests revealed Total Sulphur contents in the range <0.01 to 0.08% in association with Acid Soluble Sulphate contents of 0.04 to 0.06% SO_4.

3.4 Point Load Tests (Rock Core Samples)

The Point Load Index Test provides a rapid strength assessment from rock fragments or cores. The test specimen is compressed between two cones loaded from a hydraulic hand pump. The core fails due to the tensile forces over the diametral area between the points. The strength at failure is expressed as the point load index Is.

For purposes of comparison the Is values are corrected to give the equivalent strength for a 50 mm diameter specimen. The compressive strength of the rock (qc) can be established using a correlation suggested by Goodman where UCS ≈ 18 to 24 x Is50.

The laboratory results are enclosed in Appendix 7, and show equivalent UCS values ranging from 8MPa to 112 MPa. These equate to a wide range of UCS values from Weak to Very Strong, thus reflecting the variations in the degree of weathering of the upper limestone.

4.0 Laboratory Testing (Environmental)

A total of 19 soil samples were tested in accordance with the RILTA Suite, which is used to determine the suitability of soils for disposal to a landfill. The RILTA suite includes Heavy Metals, Polycyclic Aromatic Hydrocarbons (PAH), TPH-CWG, BTEX, PCB and Total Organic Carbon (TOC) carried out on dry soil samples. Also included are leachate analyses, whereby leachate is generated in accordance with CEN 10:1 specification and this is tested for the presence of recognised contaminants including Heavy Metals, Dissolved Organic Carbon (DOC) and Total Dissolved Solids (TDS). An Asbestos Screen is also included in the RILTA Suite.

The analyses were carried out by Eurofins Chemtest Laboratory and their reports are presented in Appendix 8. The results are also included in the Waste Characterisation Assessment, which is presented by OCM under separate cover.

5.0 Discussion

It is understood that this site is to be developed for residential purposes.

The trial pits revealed mottled brown and grey sandy gravelly clay, generally in a soft to firm condition, becoming firm to stiff with depth. The soils became more structured with depth, and graded to angular to sub-angular clayey gravel, cobbles and boulders of limestone. Refusal depths varied from place to place depending on the degree of weathering. For example, a maximum depth of 3.0 metres was achieved by TP23, while refusal was recorded at a depth of 0.8 metres in TP22. No groundwater was observed to the excavated depths.

Most of the dynamic probes recorded high resistance from nominal depth, and, in some locations, refusal was recorded within a metre of ground level. Notable exceptions were DP01 to DP05 where zones of low to moderate resistance were detected within the upper 1.5 to 2.0 metres.

Cores recovered during the construction of the monitoring holes revealed gravelly clay and limestone cobbles and boulders underlain by more structured limestone bedrock. The results of SPT tests performed during the course of rotary operations are summarised in Table 2. While the N-values are generally indicative of a very dense condition, zones of medium dense or firm to stiff material were in evidence.

5.1 Structural Foundations

The investigation revealed upper layers of gravelly clay with angular cobbles and boulders. These soils were in a soft to firm condition, becoming firm to stiff with depth These soils had the appearance of glacial till or residual bedrock. Further coring revealed more structured limestone bedrock.

The firm to stiff gravelly clay will provide a stable founding medium, with a presumed bearing resistance of approximately 150 kN/m^2. However, where foundations are placed on heavily fractured or completely weathered rock (equating to a dense granular soil), the bearing resistance can be increased to 200 to 250 kN/m^2.

Higher bearing pressures (circa 600 kPa) can be applied to the structured rock horizon, subject to close examination.

The prime consideration are the variations in ground conditions over the area of any particular structure, and the consequent differential settlements. For this reason, visual examination of foundation excavations will be of particular importance, with localised deepening where necessary to ensure uniformity of founding medium. Incorporation of steel reinforcing in foundation concrete will also be of importance. When the exact location of a structure has been finalised, additional dynamic probing can be considered to provide a more accurate sub-soil profile.

5.2 Pavement Design

The sub-base requirements should be determined in accordance with NRA HD25-26/10 Volume7: Pavement Design and Maintenance. Figure 4.1of this document shows sub-base requirements in relation to the CBR value of the sub-grade. Designs can be sub-base only or sub-base in conjunction with a capping layer. The minimum permitted design CBR is 2.5%.

Where the CBR value of the sub-grade is less than 2.5%, the options are as follows.

- The soft soil can be removed and replaced with a more suitable material. If there is a limited thickness of soft soil it can be removed in its entirety.

- Where the soil is cohesive, consideration can be given to stabilisation using cement or lime.

The results of plate bearing tests are summarised in Table 3. The results show variations in the initial CBR values. For the second load cycles, the CBR values increased, indicating that the sub-grade can benefit from additional compaction. However, it is noted that 3 of the 8 tests measured CBR values of 2% or lower for the second load cycles. This implies that some removal and replacement of soft material may be required, depending on the proposed formation levels.

The effectiveness of the additional compaction and / or excavate-and-replace operations can be verified from additional plate bearing tests on the prepared formation.

5.3 Groundwater and Trench Stability

Groundwater ingress was not observed within the trial pits. Subsequent manual dipping of standpipes showed standing groundwater levels ranging widely between 0.5 and 4.0 m BGL.

Data loggers that were in place from January to May 2022 showed that the depth to water remained mostly in the range 1.5 to 2.5 m BGL. However, a significant “spike” in water level was observed in February 2022, with 4 locations recording water within the upper metre. This was attributed to a marked increase in the rainfall intensity, as recorded by Met Eireann (Figure 2).

MONTHLY VALUES FOR DUNSANY
UP TO 16-MAY-2022

Total rainfall in millimetres for DUNSANY

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
2022	29.5	118.1	38.2	35.3	34.9			

Figure 2 – Rainfall Data for Dunsany, Co. Meath

The results of groundwater monitoring to date therefore indicates that relatively shallow excavations could intercept the groundwater table. In particular, sharp rises in the groundwater level can be expected during prolonged periods of heavy rainfall.

While water ingress through the clay soils would be expected to be slow, any excavations below the water table will ultimately fill with water as the groundwater table re-establishes to its true level. The rate of water ingress could also increase where the upper highly fractured (more permeable) limestone bedrock is intercepted.

A key consideration if adopting trench / fill techniques for foundations will be the stability of open excavations. All trial pits remained stable during the period of excavation, indicating that temporary excavations should remain stable in the short-term.

Where excavations are left open for extended periods (e.g. drainage trenches), instability is likely to occur as the sidewalls relax, in which case trench control measures (e.g. trench box) will be required.

5.4 Infiltration

The infiltration rate is the volume of water dispersed per unit exposed area per unit of time, and is generally expressed as metres/minute or metres/second.

Soakaways are generally designed in accordance with "BRE Digest 365 - Design of soakaways".

The digest suggests that a soakaway should be designed to accommodate the immediate storm-water run-off and permit infiltration into the surrounding ground sufficiently quickly to provide the necessary capacity to receive run-off from a subsequent storm.

The required soakaway capacity is obtained by calculating the inflow and outflow for a range of storm durations and choosing the storm period which gives the maximum storage requirement. Rainfall statistics are obtained from Met Eireann and calculations are usually carried out for a 30 year return period. However, the local authority may increase this figure to allow for global warming.

The field tests were performed at relatively shallow depths because of the presence of large boulders which had the appearance of residual bedrock. In view of the low infiltration rates, and the shallow rock depths, the use of conventional soakaway systems may be impractical. It may, therefore, be necessary to discharge storm water to an existing surface water system, using attenuation techniques to regulate the flow.

5.5 Chemical Attack on Buried Concrete

The results of Sulphate and pH testing showed low Sulphate and near-neutral pH levels.

With reference to Table C1 of BRE Special Digest 1: 2005, the level of Sulphate suggests a design Sulphate Class of DS-1. Assuming a static groundwater table, an ACEC (Aggressive Chemical Environment for Concrete) Classification of AC-1s is applicable, since the pH levels are greater than 5.5.

In terms of concrete to I.S. EN 206-1:2013, the chemical testing demonstrates that concrete could be manufactured to Class XA1.

5.6 Ground-Generated Gases

Gas monitoring has revealed Carbon Dioxide levels of up to 2.1%, while the levels of Methane were negligible.

The long-term exposure limit for Carbon Dioxide is 0.5% (Ref: *Construction of New Buildings on Gas Contaminated Land – BRE Publication*). It is therefore apparent that the Carbon Dioxide levels at RC01, RC02, RC03 and RC04 are potentially harmful if permitted to enter an occupied building.

Landfill gases can enter buildings through gaps around service pipes, cracks in walls below ground and floor slabs, construction joints and wall cavities. For this site, the risk of gas ingress to structures will be somewhat mitigated by the construction of an under-croft car park, which will support ventilation. Nevertheless, a full risk assessment should be undertaken with regard to all structures, particularly those where no under-croft construction is proposed.

Guidance on the construction of passive soil gas protective measures is provided in the Environment Agency and BRE publication **"***Protective measures for housing on gas-contaminated ground***".**

It will be extremely important to seek advice on the Health and Safety issues relating to construction personnel operating on a site where Carbon Dioxide is present in the ground.

5.7 Chemical Assessment of Basal Granular Material

Chemical analyses of the dense granular material (highly weathered limestone) at the base of the trial pits show very low Sulphate (Acid Soluble) and Sulphur levels. There is therefore no immediate concern regarding the potential for pyritic heave of foundations constructed directly on the limestone bedrock. However, as is good practice, foundation pits in fracture limestone should be blinded without delay in order to minimise the period for potential oxidation.

If this material is proven to be weathered limestone, and subsequently crushed for re-use as capping on this site, the maximum Total Sulphur level of 0.08% satisfies the Upper Limit of 1% for Class 6F Capping, as specified in Table 6/1 of the Series 600 (Specification for Road Works).

Appendix 1 Dynamic Probe Records

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP01
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	5
						0.40	5
						0.50	5
						0.60	6
						0.70	6
						0.80	7
						0.90	6
1.0						1.00	4
						1.10	4
						1.20	3
						1.30	2
						1.40	0
						1.50	0
						1.60	0
						1.70	3
						1.80	3
						1.90	10
2.0						2.00	16
	End of Probe at 2.20 m					2.10	25
3.0							
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP02
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	4
						0.40	5
						0.50	4
						0.60	3
						0.70	3
						0.80	3
						0.90	4
1.0						1.00	3
						1.10	4
						1.20	3
						1.30	3
						1.40	2
						1.50	3
						1.60	3
						1.70	3
						1.80	3
						1.90	8
2.0						2.00	9
						2.10	11
						2.20	12
						2.30	18
						2.40	21
						2.50	25
	End of Probe at 2.60 m						
3.0							
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP03

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	4
						0.40	1
						0.50	2
						0.60	2
						0.70	3
						0.80	4
						0.90	3
1.0						1.00	3
						1.10	3
						1.20	4
						1.30	7
						1.40	25
	End of Probe at 1.50 m						
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP04
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

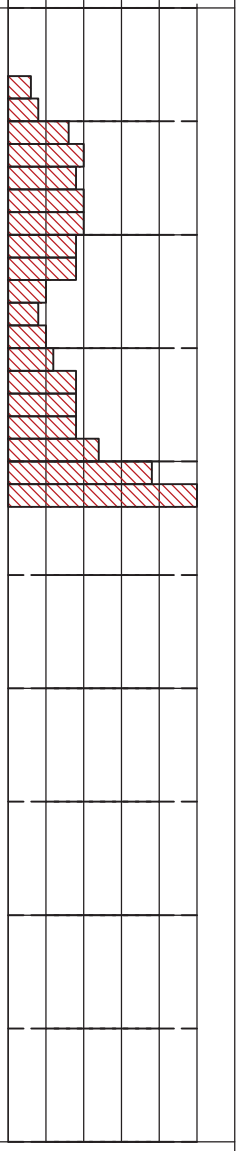
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	3
						0.40	4
						0.50	8
						0.60	10
						0.70	9
						0.80	10
						0.90	10
1.0						1.00	9
						1.10	9
						1.20	5
						1.30	4
						1.40	5
						1.50	6
						1.60	9
						1.70	9
						1.80	9
						1.90	12
2.0						2.00	19
	End of Probe at 2.20 m					2.10	25
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP05**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

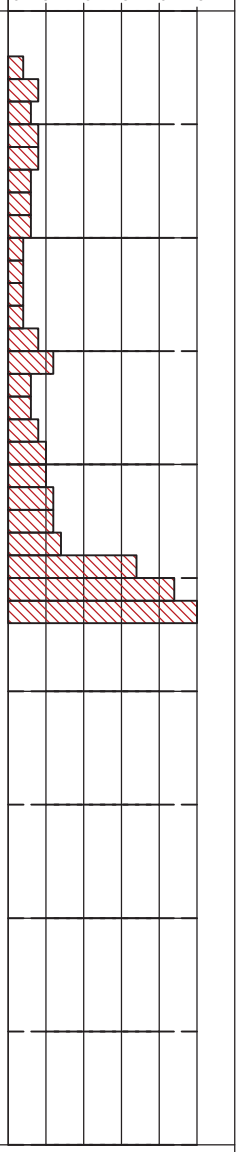
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	4
						0.40	3
						0.50	4
						0.60	4
						0.70	3
						0.80	3
						0.90	3
1.0						1.00	2
						1.10	2
						1.20	2
						1.30	2
						1.40	4
						1.50	6
						1.60	3
						1.70	3
						1.80	4
						1.90	5
2.0						2.00	5
						2.10	6
						2.20	6
						2.30	7
						2.40	17
						2.50	22
						2.60	25
	End of Probe at 2.70 m						
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP06**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

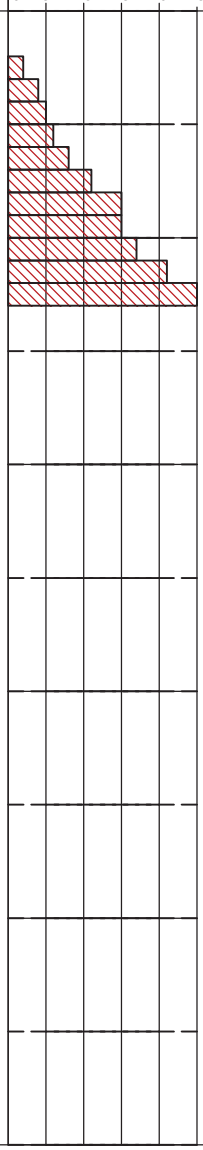
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	4
						0.40	5
						0.50	6
						0.60	8
						0.70	11
						0.80	15
						0.90	15
1.0						1.00	17
						1.10	21
						1.20	25
	End of Probe at 1.30 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP07
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	1
						0.10	4
						0.20	6
						0.30	7
						0.40	8
						0.50	12
						0.60	16
						0.70	15
						0.80	16
						0.90	14
1.0						1.00	12
						1.10	12
						1.20	6
						1.30	5
						1.40	2
						1.50	1
						1.60	1
						1.70	14
						1.80	12
						1.90	8
2.0						2.00	10
	End of Probe at 2.20 m					2.10	25
3.0							
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP08**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	1
						0.20	2
						0.30	4
						0.40	7
						0.50	9
						0.60	17
						0.70	19
						0.80	19
						0.90	20
1.0						1.00	19
	End of Probe at 1.20 m					1.10	25
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP09

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	1
						0.30	3
						0.40	5
						0.50	7
						0.60	10
						0.70	10
						0.80	16
						0.90	21
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP10
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

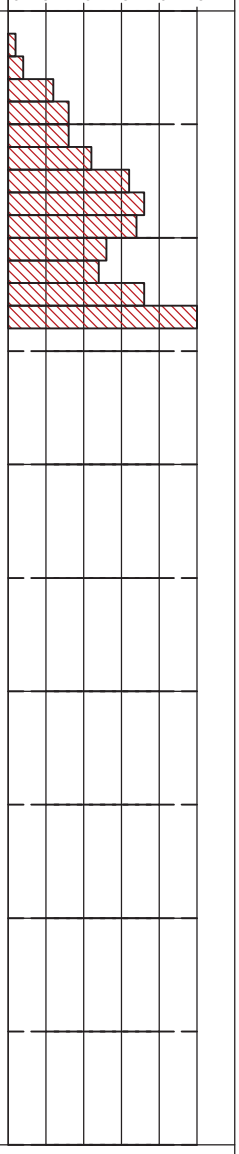
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	1
						0.20	2
						0.30	6
						0.40	8
						0.50	8
						0.60	11
						0.70	16
						0.80	18
						0.90	17
1.0						1.00	13
						1.10	12
						1.20	18
						1.30	25
	End of Probe at 1.40 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP11

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

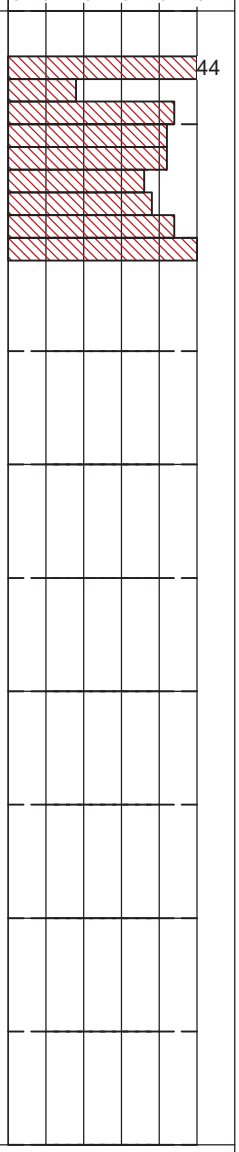
CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	44
						0.30	9
						0.40	22
						0.50	21
						0.60	21
						0.70	18
						0.80	19
						0.90	22
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP12
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

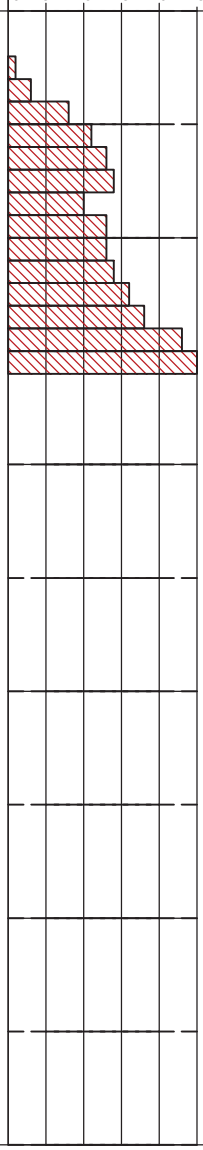
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	1
						0.30	3
						0.40	8
						0.50	11
						0.60	13
						0.70	14
						0.80	10
						0.90	13
1.0						1.00	13
						1.10	14
						1.20	16
						1.30	18
						1.40	23
						1.50	25
	End of Probe at 1.60 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP13
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

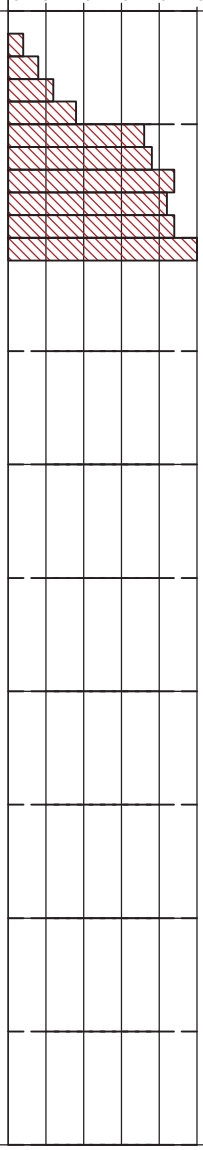
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	2
						0.20	4
						0.30	6
						0.40	9
						0.50	18
						0.60	19
						0.70	22
						0.80	21
						0.90	22
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP14**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

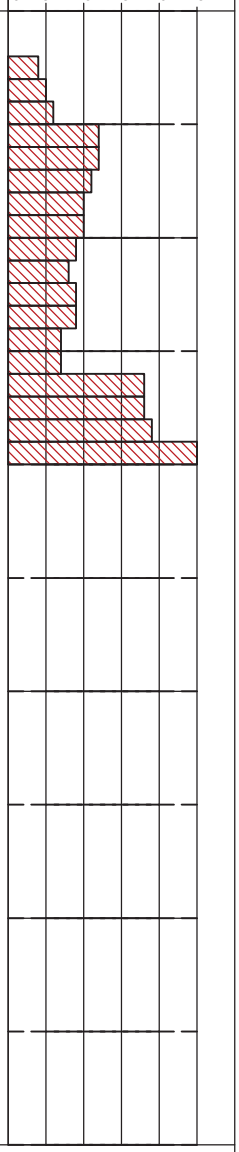
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	4
						0.30	5
						0.40	6
						0.50	12
						0.60	12
						0.70	11
						0.80	10
						0.90	10
1.0						1.00	9
						1.10	8
						1.20	9
						1.30	9
						1.40	7
						1.50	7
						1.60	18
						1.70	18
						1.80	19
						1.90	25
2.0	End of Probe at 2.00 m						
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP15**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

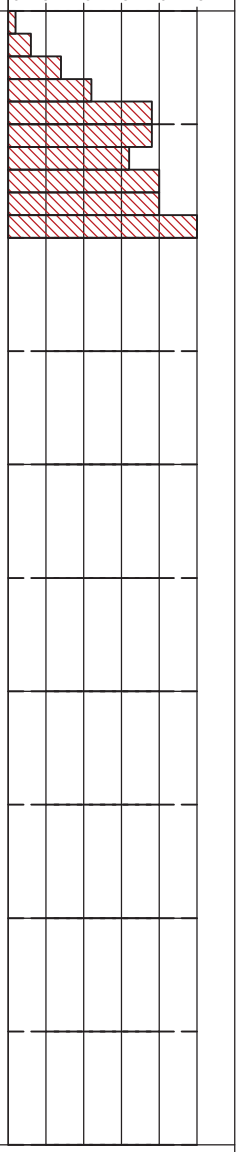
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	1
						0.10	3
						0.20	7
						0.30	11
						0.40	19
						0.50	19
						0.60	16
						0.70	20
						0.80	20
						0.90	25
1.0	End of Probe at 1.00 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP16
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	4
						0.30	3
						0.40	5
						0.50	12
						0.60	13
						0.70	12
						0.80	10
						0.90	9
1.0						1.00	9
						1.10	11
						1.20	12
						1.30	16
						1.40	17
						1.50	19
						1.60	25
	End of Probe at 1.70 m						
2.0							
3.0							
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP17

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	1
						0.10	4
						0.20	12
						0.30	18
						0.40	15
						0.50	16
						0.60	16
						0.70	19
						0.80	22
						0.90	22
1.0	End of Probe at 1.10 m					1.00	25
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP18**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

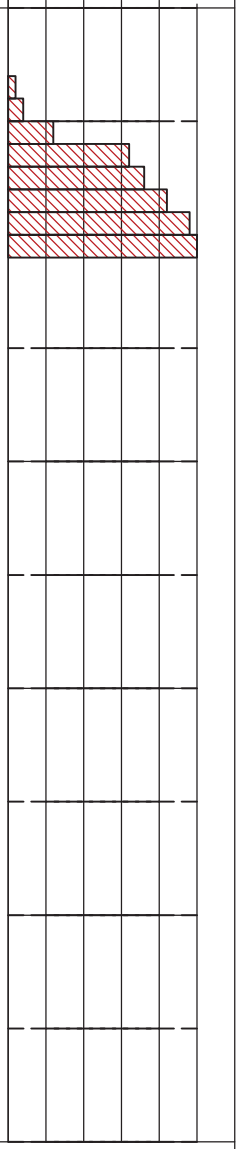
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	1
						0.40	2
						0.50	6
						0.60	16
						0.70	18
						0.80	21
						0.90	24
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP19
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

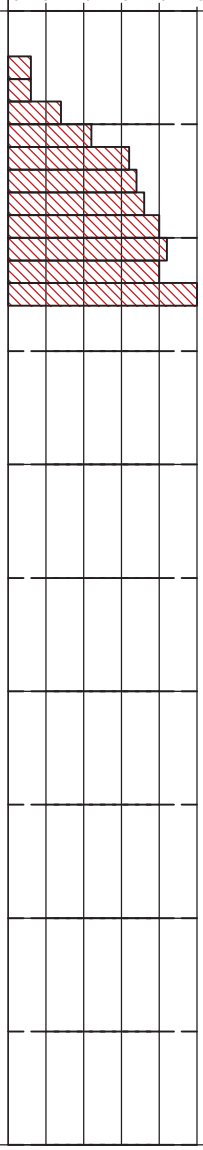
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	3
						0.30	3
						0.40	7
						0.50	11
						0.60	16
						0.70	17
						0.80	18
						0.90	20
1.0						1.00	21
						1.10	20
	End of Probe at 1.30 m					1.20	25
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP20**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

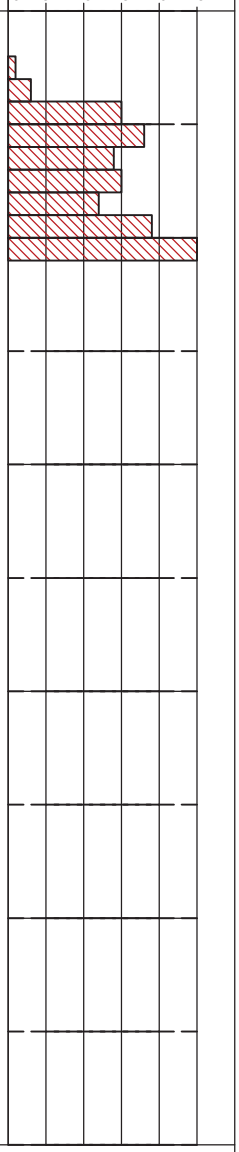
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	1
						0.30	3
						0.40	15
						0.50	18
						0.60	14
						0.70	15
						0.80	12
						0.90	19
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP21
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50
INCREMENT SIZE (mm) 100
FALL HEIGHT (mm) 500

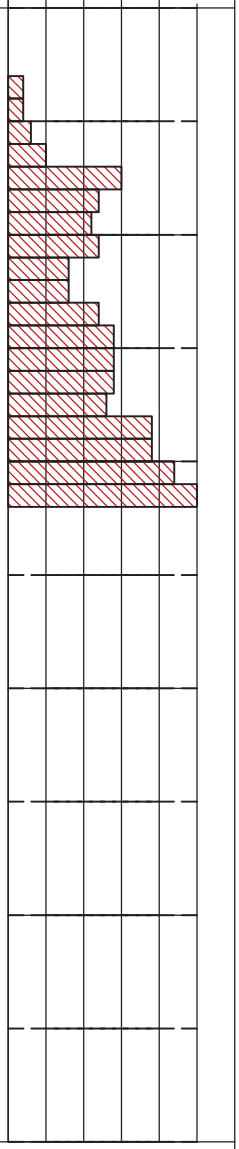
DATE DRILLED 26/10/2021
DATE LOGGED 27/10/2021

CLIENT
ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	2
						0.40	2
						0.50	3
						0.60	5
						0.70	15
						0.80	12
						0.90	11
1.0						1.00	12
						1.10	8
						1.20	8
						1.30	12
						1.40	14
						1.50	14
						1.60	14
						1.70	13
						1.80	19
						1.90	19
2.0						2.00	22
	End of Probe at 2.20 m					2.10	25
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP22

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	1
						0.40	2
						0.50	2
						0.60	4
						0.70	5
						0.80	7
						0.90	12
1.0						1.00	18
	End of Probe at 1.20 m					1.10	25
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. DP23

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

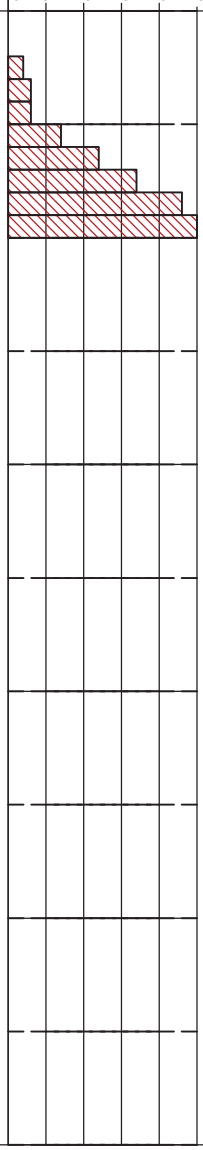
CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	3
						0.40	3
						0.50	7
						0.60	12
						0.70	17
						0.80	23
						0.90	25
1.0	End of Probe at 1.00 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

DYNAMIC PROBE RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyouster , Celbridge,Co.Kildare

PROBE NO. **DP24**

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

INCREMENT SIZE (mm) 100

FALL HEIGHT (mm) 500

DATE DRILLED 26/10/2021

DATE LOGGED 27/10/2021

CLIENT

ENGINEER DBFL

PROBE TYPE DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	3
						0.40	5
						0.50	6
						0.60	8
						0.70	10
						0.80	11
						0.90	20
1.0						1.00	25
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record

0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 23679.GPJ IGSL.GDT 1/11/21

Appendix 2 Trial Pit Records

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP01**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Soft to firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.					AA150903	B	0.40-1.00		
1.0 Firm brownish grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are sub angular to angular and fine to coarse. Refusal at 1.5 m on angular limestone weathered rockhead.		1.00			AA150904	B	1.00-1.50		
End of Trial Pit at 1.50m		1.50							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP02**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Soft brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		0.30			AA150901	B	0.30-0.80		
Firm greyish brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		0.80							
1.0									
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels and cobbles are angular to sub rounded and fine to coarse. Refusal at 1.8 m on angular limestone weathered rockhead.		1.50			AA150902	B	1.50-1.80		
		1.80							
End of Trial Pit at 1.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP03**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
					Sample Ref	Type	Depth		
0.0 TOPSOIL		0.30							
Firm brown slightly gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.					AA150905	B	0.30-0.90		
Firm greyish brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular limestone weathered rockhead.		0.90			AA150906	B	0.90-1.40		
End of Trial Pit at 1.40m		1.40							

1.0 2.0 3.0 4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP04**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Soft to firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA160296	B	0.50		
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.		1.20							
Weathered rockhead recovered as tabular angular cobble and boulder sized blocks of grey limestone. Refusal at 1.5 m.		1.50							
End of Trial Pit at 1.50m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP05**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm greyish brown slightly sandy CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are sub angular to sub rounded and fine to coarse.					AA150911	B	0.30-0.90		
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels and cobbles are angular to sub rounded and fine to coarse. Refusal at 1.2 m on angular limestone weathered rockhead.		0.90			AA150912	B	0.90-1.20		
1.0 End of Trial Pit at 1.20m		1.20							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP06**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.60							
Firm greyish brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular limestone weathered rockhead.		0.90			AA150909	B	0.60-0.90		
1.0 Firm to stiff grey slightly sandy gravelly CLAY with low cobble and low boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal at 1.2 m on angular limestone weathered rockhead.		1.20			AA150910	B	0.90-1.20		
End of Trial Pit at 1.20m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP07**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Soft to firm brown sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA160297	B	0.50		
Firm to stiff brownish grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.									
1.0									
		1.30			AA160298	B	1.20		
Weathered rockhead recovered as tabular angular cobble and boulder sized blocks of grey limestone. Refusal at 1.5 m.		1.50							
End of Trial Pit at 1.50m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP08**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
					Sample Ref	Type	Depth		
0.0 TOPSOIL		0.25							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse. Refusal at 1.6 m on angular tabular limestone weathered rockhead.					AA18359	B	0.50		
1.0									
		1.60			AA18360	B	1.50		
End of Trial Pit at 1.60m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP09**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.					AA160299	B	0.70		
1.0 Weathered rockhead recovered as tabular angular cobble sized blocks of grey limestone. Refusal at 1.5 m.		1.10 1.20							
End of Trial Pit at 1.60m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP10**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	04/11/2021
		DATE COMPLETED	04/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular and fine to coarse.		0.80							
Firm greyish brown slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub rounded and fine to coarse.		1.30			AA150907	B	0.80-1.30		
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble and medium boulder content. Refusal at 1.7 m on angular limestone weathered rockhead.		1.70			AA150908	B	1.30-1.70		
End of Trial Pit at 1.70m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP11**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	29/10/2021
		DATE COMPLETED	29/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm brown sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.60			AA156966	B	0.50		
Firm to stiff light brown slightly sandy very gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		1.20							
1.0 Very weathered rockhead recovered as angular platey gravels with some clay. Refusal at 1.4 m.		1.40							
End of Trial Pit at 1.40m					AA156967	B	1.40		
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP12**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
					Sample Ref	Type	Depth		
0.0 TOPSOIL		0.30							
Firm to stiff brown mottled grey slightly gravelly sandy silty CLAY. Gravels are sub angular to sub rounded and fine to medium.					AA18365	B	0.50		
1.0		1.20							
Firm to stiff brown mottled grey sandy silty very gravelly CLAY. Gravels and cobbles are sub angular to sub rounded and fine to coarse. Refusal 1.4 m on angular tabular limestone weathered rockhead.		1.40			AA18366	B	1.40		
End of Trial Pit at 1.40m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP13**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse.		0.80			AA150913	B	0.30-0.80		
Firm to stiff grey slightly sandy gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are sub angular to to angular and fine to coarse. Refusal at 1.1 m on angular limestone weathered rockhead.		1.10			AA150914	B	0.80-1.10		
End of Trial Pit at 1.10m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP14**
		SHEET	Sheet 1 of 1
LOGGED BY	C.Mattimoe	**CO-ORDINATES**	
		DATE STARTED	05/11/2021
		DATE COMPLETED	05/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Soft brown slightly sandy gravelly CLAY. Gravels are angular to sub angular and fine to coarse.		0.30			AA150915	B	0.30-0.80		
Soft to firm brownish grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse.		0.80			AA150916	B	0.80-1.00		
Firm grey slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub rounded platey and fine to coarse. Refusal at 1.3 m on angular limestone weathered rockhead.		1.00							
End of Trial Pit at 1.30m		1.30							
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP15**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.50							
Very weathered rockhead recovered as angular platey cobbles and boulders of grey limestone with clay. Tough digging. Refusal at 0.8 m.		0.80			AA156977	B	0.60		
1.0 End of Trial Pit at 0.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP16**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy slightly gravelly CLAY. Gravels are sub angular to sub rounded.		0.60			AA156960	B	0.50		
Firm to stiff greyish brown slightly sandy very gravelly CLAY with high cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.1 m on angular tabular limestone weathered rockhead.									
1.0 End of Trial Pit at 1.10m		1.10							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP17**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy slightly gravelly CLAY. Gravels are sub angular to sub rounded.		0.60			AA156973	B	0.50		
Firm grey slightly sandy very gravelly CLAY with high cobble content and medium boulder content. Very weathered angular platey limestone rockhead from 1 m within the clay refusal at 1.8 m.					AA156974	B	1.10		
1.0									
End of Trial Pit at 1.80m		1.80							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP18**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm to stiff brown slightly sandy CLAY.		0.60			AA18361	B	0.50		
Firm to stiff greyish brown slightly sandy very gravelly CLAY with high cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.2 m on angular tabular limestone weathered rockhead.		1.20			AA18362	B	1.10		
End of Trial Pit at 1.20m									

1.0
2.0
3.0
4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP19**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		0.60							
Firm to stiff brownish grey sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular platey weathered rockhead of grey limestone.					AA156957	B	0.60		
1.0					AA156959	B	1.20		
End of Trial Pit at 1.40m		1.40							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP20**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	01/11/2021
		DATE COMPLETED	01/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
					Sample Ref	Type	Depth		
0.0 TOPSOIL		0.25							
Firm to stiff greyish brown slightly sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse.		0.70			AA156970	B	0.50		
1.0 Stiff brownish grey sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular platey and fine to coarse. Refusal at 1.4 on weathered rockhead.		1.40			AA156971	B	1.30		
End of Trial Pit at 1.40m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP21**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25							
Firm to stiff brownish grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse. Refusal at 1.4 m on angular platey weathered rockhead of grey limestone.		0.30			AA156964	B	0.50		
		0.60			AA18363	B	0.50		
Firm grey sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub angular and fine to coarse.		0.70							
1.0									
Stiff greyish brown sandy very gravelly CLAY with high cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal at 1.8 m on angular platey weathered rockhead of grey limestone.		1.10			AA156965	B	1.50		
					AA18364	B	1.50		
Rockhead recovered as angular tabular cobble and boulder sized grey limestone blocks. Refusal at 1.1m.		1.80							
End of Trial Pit at 1.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP22**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY.Gravels are sub angular to sub rounded and fine to coarse.		0.60			AA156972	B	0.50		
Very weathered rock head recovered as angular platey cobbles and boulders of blackish grey limestone.		0.80							
End of Trial Pit at 0.80m									
1.0									
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP23**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm to stiff brown sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		1.00			AA156961	B	0.50		
1.0 Firm grey mottled brown and black sandy silty gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are sub angular to sub rounded and fine to coarse.		1.60			AA156962	B	1.50		
Firm grey mottled brown and black sandy silty gravelly CLAY. Gravels are sub angular to sub rounded and fine to coarse.		2.30							
2.0 Firm black mottled grey and brown sandy silty CLAY.		3.00			AA156963	B	2.80		
3.0 End of Trial Pit at 3.00m									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP24**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	27/10/2021
		DATE COMPLETED	27/10/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20							
Firm brown slightly sandy gravelly CLAY with low cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.50							
Firm to stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are angular to sub rounded and fine to coarse.					AA160294	B	0.50		
1.0									
		1.30							
Very weathered rockhead recovered as angular platey gravels with some clay. Refusal at 1.5 m due to this rock.		1.50							
End of Trial Pit at 1.50m					AA160295	B	1.50		
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP25**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	11/11/2021
		DATE COMPLETED	11/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy gravelly CLAY with medium cobble content. Gravels and cobbles are sub angular to sub rounded and fine to coarse.		0.60							
Stiff brown slightly sandy very gravelly CLAY with medium cobble content and medium boulder content. Gravels cobbles and boulders are angular to sub angular and fine to coarse. Refusal on large boulders/ possible weathered limestone rockhead.									
End of Trial Pit at 1.80m		1.80							

1.0
2.0
3.0
4.0

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

TRIAL PIT RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyouster , Celbridge,Co.Kildare	**TRIAL PIT NO.**	**TP26**
		SHEET	Sheet 1 of 1
LOGGED BY	S.Hannon	**CO-ORDINATES**	
		DATE STARTED	02/11/2021
		DATE COMPLETED	02/11/2021
CLIENT	HWBC LTD	**GROUND LEVEL (m)**	
ENGINEER	DBFL	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm brown slightly sandy slightly gravelly CLAY. Gravels are sub angular to sub rounded.		0.60			AA156975	B	0.50		
Stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Gravels and cobbles ae sub angular to sub rounded and fine to coarse.					AA156976	B	1.70		
2.0 End of Trial Pit at 2.20m		2.20							
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Stable

General Remarks
CAT Scanned location for services.

IGSL TP LOG 23679.GPJ IGSL.GDT 24/1/22

Appendix 3 Rotary Corehole Records

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO **RC01**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 23/11/2021
DATE COMPLETED 23/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy gravelly CLAY with occasional cobbles				
1	1.30								1.30			N = 97/180 mm (9, 17, 21, 26, 25, 25)
2		100	28	8				Medium strong to weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone grading regularly (every approx 0.10-0.40m) into calci-siltite limestone with subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly to moderately weathered (at 2.45-3.65m & 3.85-4.30m).				
3	2.80	100	14	11				Discontinuities are medium to closely spaced, smooth to locally rough, planar to irregular. Apertures are tight to open, commonlyclay-smeared, commonly penetrative iron-oxide stained, locally calcite-veined (1-8mm thick). Dips are irregular to locally 40° & 70°.				
4	4.30							End of Borehole at 4.30 m	4.30			
5												
6												
7												
8												
9												

REMARKS

Hole cased 0.00-1.30m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-11-21	4.30	1.00	4.30	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
23-11-21	4.30	1.30	3.40	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO **RC02**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 23/11/2021
DATE COMPLETED 23/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown cobbly CLAY	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy gravelly CLAY with occasional cobbles				N = 19 (11, 8, 6, 4, 4, 5)
2	3.00								3.00			N = 28 (4, 5, 7, 6, 6, 9)
3		100	23	0				Strong to locally weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone with layers of calci-siltite limestone and subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly weathered to moderately weathered at fissile mudstone/shale zones at (3.94-3.98m, 5.14-5.23m & 5.31-5.33m).				N = 25/10 mm (25, 25)
4	4.50											
5		100	67	53				Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally curviplanar. Apertures are tight to locally open, locally clay-smeared, locally slightly iron-oxide stained, locally calcite-veined (1-15mm thick). Dips are 30-40° & locally 70°.				
6	6.00							End of Borehole at 6.00 m	6.00			
7												
8												
9												

REMARKS

Hole cased 0.00-3.00m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-11-21	6.00	1.00	6.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
23-11-21	6.00	3.00	5.60	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO **RC03**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 22/11/2021
DATE COMPLETED 22/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown cobbly CLAY	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey sandy COBBLES	2.50			N = 55 (3, 5, 4, 8, 14, 29)
2	2.50											N = 100 (7, 14, 19, 20, 28, 33)
3		100	41	15				Strong to locally weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone with layers of calci-siltite limestone and subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly weathered to moderately weathered at fissile mudstone/shale zones at (2.92-2.95m, 3.05-3.07m, 3.21-3.23m & 5.35-5.38m). Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally curviplanar. Apertures are tight to locally open, locally clay-smeared, locally slightly iron-oxide stained, locally calcite-veined (1-20mm thick). Dips are 20-30° & locally 70°.				
4	4.00	100	66	35								
5	5.50								5.50			
6								End of Borehole at 5.50 m				
7												
8												
9												

REMARKS

Hole cased 0.00-2.50m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
22-11-21	5.50	1.00	5.50	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
22-11-21	5.50	2.50	5.10	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO RC04

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 19/11/2021
DATE COMPLETED 19/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown CLAY	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown cobbly CLAY	2.00			N = 16 (3, 4, 4, 3, 4, 5)
2								SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly COBBLES	3.00			N = 72 (4, 9, 11, 18, 21, 22)
3								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey sandy COBBLES	4.00			N = 85 (5, 8, 9, 24, 27, 25)
4	4.00	40	0	0				Returns of MADE GROUND - Consisting of gravelly cobbles with concrete				N = 25/10 mm (25, 25)
5	5.00	30	0	0								N = 25/10 mm (25, 25)
6	6.00	30	0	0								N = 50/30 mm (19, 23, 25, 25)
7	7.00	30	0	0								N = 25/20 mm (7, 25, 25)
8	8.00							End of Borehole at 8.00 m	8.00			N = 25/20 mm (21, 25, 25)
9												

REMARKS

Hole cased 0.00-8.00m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
3.40	3.40				Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
19-11-21	8.00	1.00	8.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
19-11-21	8.00	8.00	6.40	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO RC05
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 24/11/2021
DATE COMPLETED 24/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy gravelly CLAY with occasional cobbles				
1												N = 12 (3, 3, 3, 3, 3, 3)
2												N = 26 (4, 9, 5, 7, 7, 7)
3												N = 50 (10, 10, 17, 14, 11, 8)
4	4.00								4.00			
5	5.50	100	81	23				Strong to locally weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone with layers of calci-siltite limestone and subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly weathered to moderately weathered at fissile mudstone/shale zones at (4.32-4.34m).				N = 25/10 mm (25, 25)
6	7.00	100	86	71				Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally curviplanar. Apertures are tight to locally open, locally clay-smeared, locally slightly iron-oxide stained, locally calcite-veined (1-8mm thick). Dips are 10-20° & locally 70°.	7.00			
7								End of Borehole at 7.00 m				
8												
9												

REMARKS

Hole cased 0.00-4.00m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.80	2.80				Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
24-11-21	7.00	1.00	7.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24-11-21	7.00	4.00	1.40	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT Lands at Ballyoulster, Celbridge,Co.Kildare

DRILLHOLE NO **RC06**
SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE BT - 44
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 78

DATE COMMENCED 24/11/2021
DATE COMPLETED 24/11/2021

CLIENT HWBC LTD
ENGINEER DBFL

DRILLED BY IGSL
LOGGED BY D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy CLAY	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey sandy COBBLES	2.60			N = 19 (3, 4, 4, 4, 5, 6)
2	2.60											N = 33 (2, 12, 6, 9, 9, 9)
3		100	60	27				Strong to locally weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone with layers of calci-siltite limestone and subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly weathered to moderately weathered at fissile mudstone/shale zones at (2.81-2.85m & 5.04-5.07m).				
4	4.10											
5		100	66	34				Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally curviplanar. Apertures are tight to locally open, locally clay-smeared, locally slightly iron-oxide stained, locally calcite-veined (1-5mm thick). Dips are 10° & locally 80°.	5.60			
	5.60							End of Borehole at 5.60 m				
6												
7												
8												
9												

REMARKS

Hole cased 0.00-2.60m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
24-11-21	5.60	1.00	5.60	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24-11-21	5.60	2.60	2.40	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyoulster, Celbridge,Co.Kildare	**DRILLHOLE NO**	**RC07**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**DATE COMMENCED**	17/11/2021
GROUND LEVEL (mOD)		**DATE COMPLETED**	17/11/2021
CLIENT	HWBC LTD	**DRILLED BY**	IGSL
ENGINEER	DBFL	**LOGGED BY**	D.O'Shea
RIG TYPE	BT - 44		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	78		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey COBBLES	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of sandy gravelly CLAY	2.00			N = 62 (9, 17, 13, 15, 17, 17)
2								SYMMETRIX DRILLING: No recovery, observed by driller as returns of sandy GRAVEL	3.00			N = 27 (4, 6, 9, 5, 7, 6)
3								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey gravelly COBBLES	4.20			N = 18 (3, 4, 3, 4, 4, 7)
4	4.20	60	0	0				Returns of clayey gravelly COBBLES - Gravel is angular to subrounded medium to coarse of limestone. Cobbles are subrounded of limestone.	5.20			N = 69/95 mm (3, 4, 19, 25, 25)
5	5.20											
	5.50	0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown clayey gravelly COBBLES	5.50			N = 79/170 mm (6, 9, 10, 19, 25, 25)
6		100	0	0				Returns of clayey gravelly COBBLES - Gravel is angular to subrounded medium to coarse of limestone. Cobbles are subrounded of limestone.	7.00			
7	7.00	0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY	8.00			N = 81 (6, 19, 26, 18, 17, 20)
8	8.00							End of Borehole at 8.00 m				N = 55 (8, 10, 12, 14, 14, 15)
9												

REMARKS

Hole cased 0.00-8.00m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.40	2.40				Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
17-11-21	8.00	1.00	8.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
17-11-21	8.00	8.00	1.90	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 23679

CONTRACT	Lands at Ballyoulster, Celbridge,Co.Kildare	**DRILLHOLE NO**	**RC08**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**DATE COMMENCED**	18/11/2021
GROUND LEVEL (mOD)		**DATE COMPLETED**	18/11/2021
CLIENT	HWBC LTD	**DRILLED BY**	IGSL
ENGINEER	DBFL	**LOGGED BY**	D.O'Shea
		RIG TYPE	BT - 44
		FLUSH	Air/Mist
		INCLINATION (deg)	-90
		CORE DIAMETER (mm)	78

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown CLAY	1.00			
1								SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy gravelly CLAY with occasional cobbles				N = 78 (6, 12, 17, 16, 24, 21)
2												N = 65 (7, 10, 14, 17, 15, 19)
3												N = 104 (9, 19, 28, 32, 21, 23)
4	4.00								4.00			
4		100	67	43				Strong to locally weak, medium to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained, LIMESTONE (argillaceous limestone with layers of calci-siltite limestone and subordinate shaley MUDSTONE, local stylolites, pyrite present), slightly weathered to moderately weathered at fissile mudstone/shale zones at (5.54-5.98m).				N = 25/0 mm (25, 25)
5	5.50											
6		100	52	18				Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally curviplanar. Apertures are tight to locally open, locally clay-smeared, locally slightly iron-oxide stained, locally calcite-veined (1-5mm thick). Dips are 10°, 40° & locally 80° & irregular.				
7	7.00								7.00			
7								End of Borehole at 7.00 m				
8												
9												

REMARKS

Hole cased 0.00-4.00m. Erect Covid-19 Safe Zone - 1hr.

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
3.20	3.20				Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
18-11-21	7.00	1.00	7.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
18-11-21	7.00	4.00	6.20	Water level recorded 5 mins after end of drilling.

IGSL RC FI 10M 23679.GPJ IGSL.GDT 19/1/22

RC01 Box 1 of 1 – 1.30-4.30m

RC02 Box 1 of 1 – 3.00-6.00m

RC03 Box 1 of 1 – 2.50-5.50m

RC04 Box 1 of 1 – 2.50-5.50m

RC05 Box 1 of 1 – 4.00-7.00m

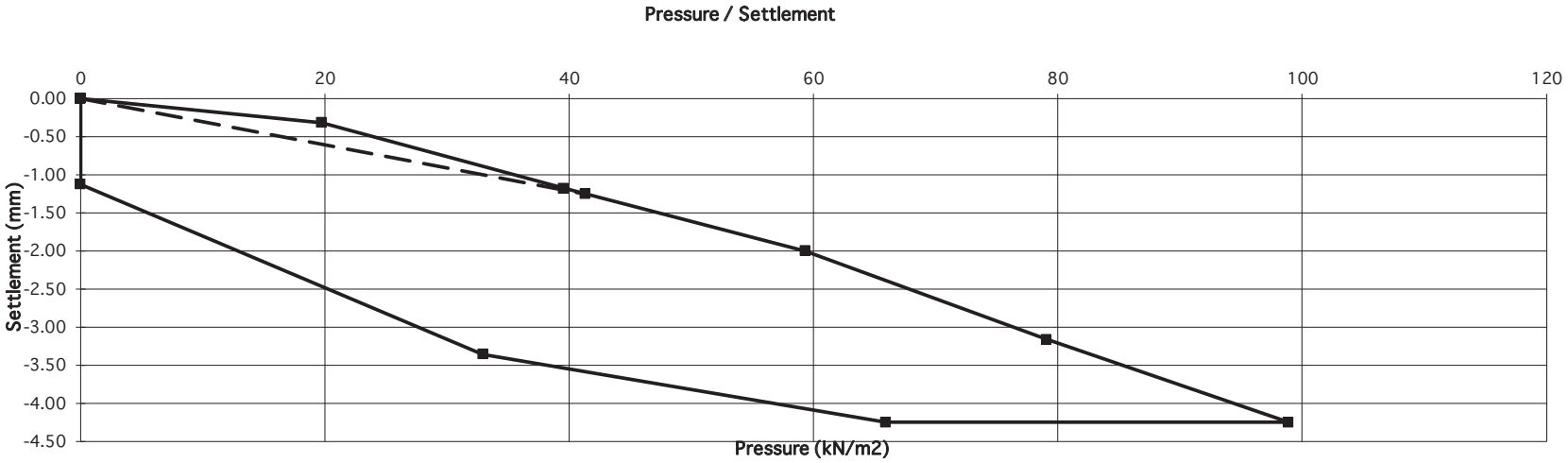
RC06 Box 1 of 1 – 2.60-5.60m

RC07 Box 1 of 1 – 4.20-7.00m

RC08 Box 1 of 1 – 4.00-7.00m

Appendix 4 Plate Bearing Test Results

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127779		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 1 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm		
Client	DBFL	Easting (m)	
Plate Diameter:	450 mm	Northing (m)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Ground Level (mOD)	
Technician	S.Hannon	Sample Ref No. N/A	
Authorised by		Depth 0.00 m bgl	
Date	28/10/2021		



Gradient at 1.25 mm settlement intersection = 33
Modulus of subgrade reaction = 21 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.9 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

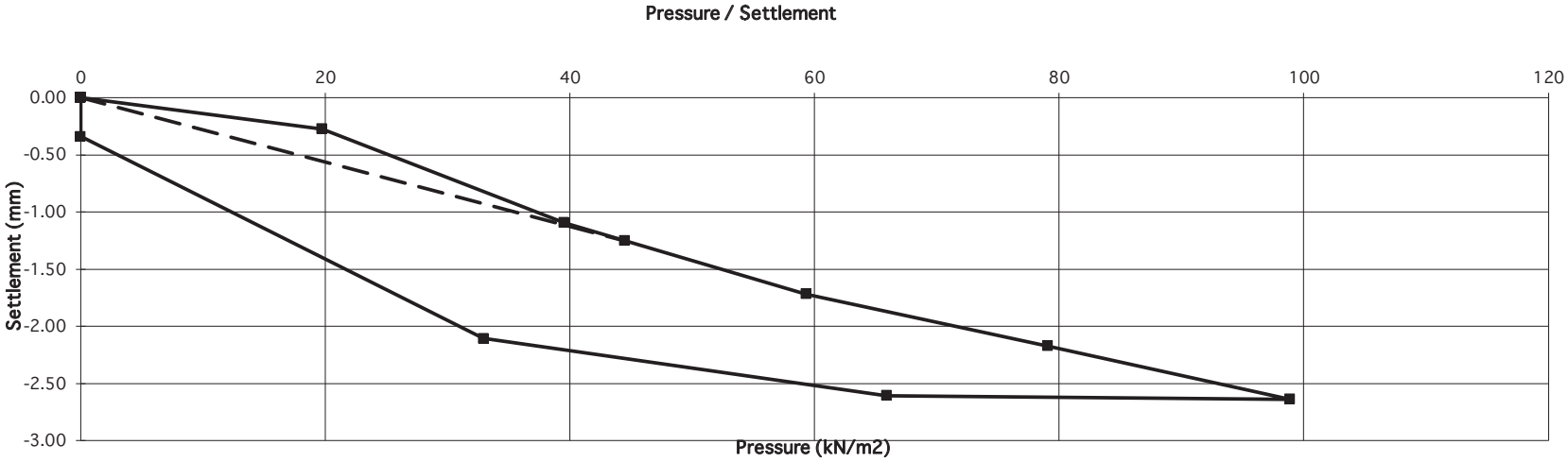
Reference No.	R127779
Contract	Ballyouster
Test No.	PBT 1 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

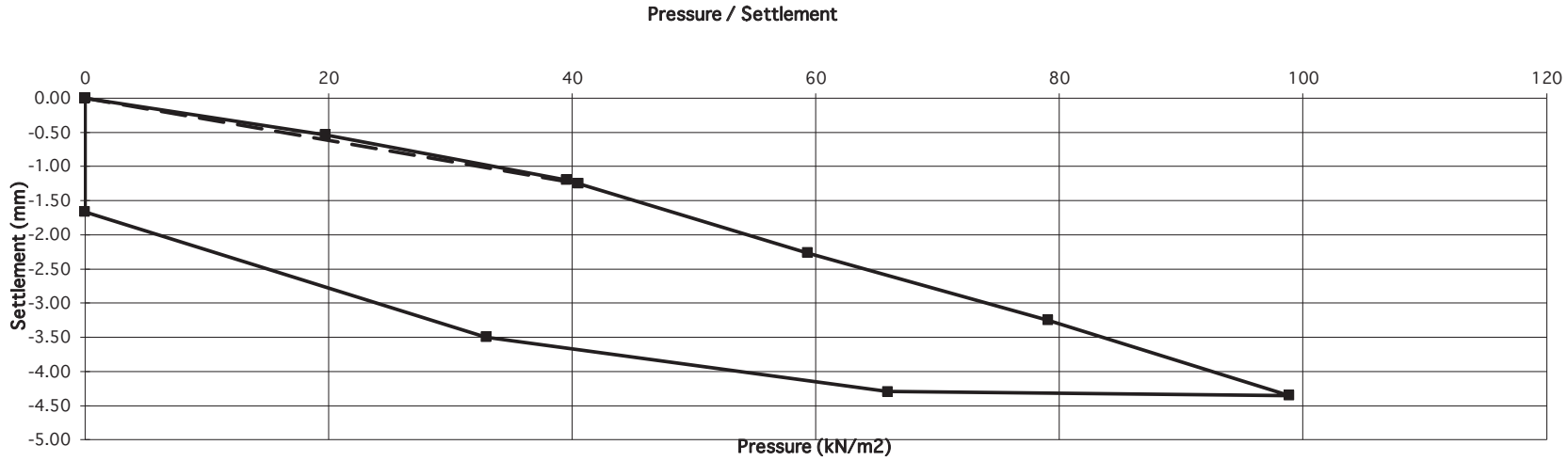
Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 36
Modulus of subgrade reaction = 23 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.2 %

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127780		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 2 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm		
Client	DBFL	Easting (m)	
Plate Diameter:	450 mm	Northing (m)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Ground Level (mOD)	
Technician	S.Hannon	Sample Ref No. N/A	
Authorised by		Depth 0.00 m bgl	
Date	28/10/2021		



Gradient at 1.25 mm settlement intersection = 32
Modulus of subgrade reaction = 21 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.9 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

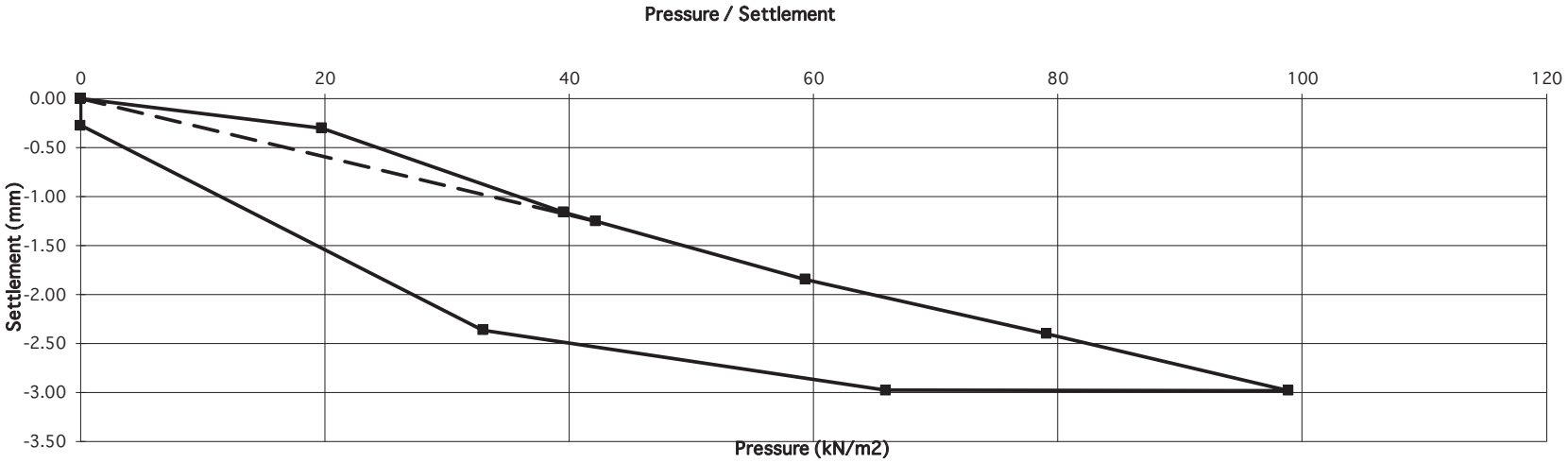
Reference No.	R127780
Contract	Ballyouster
Test No.	PBT 2 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test (natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 34
Modulus of subgrade reaction = 22 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.0 %

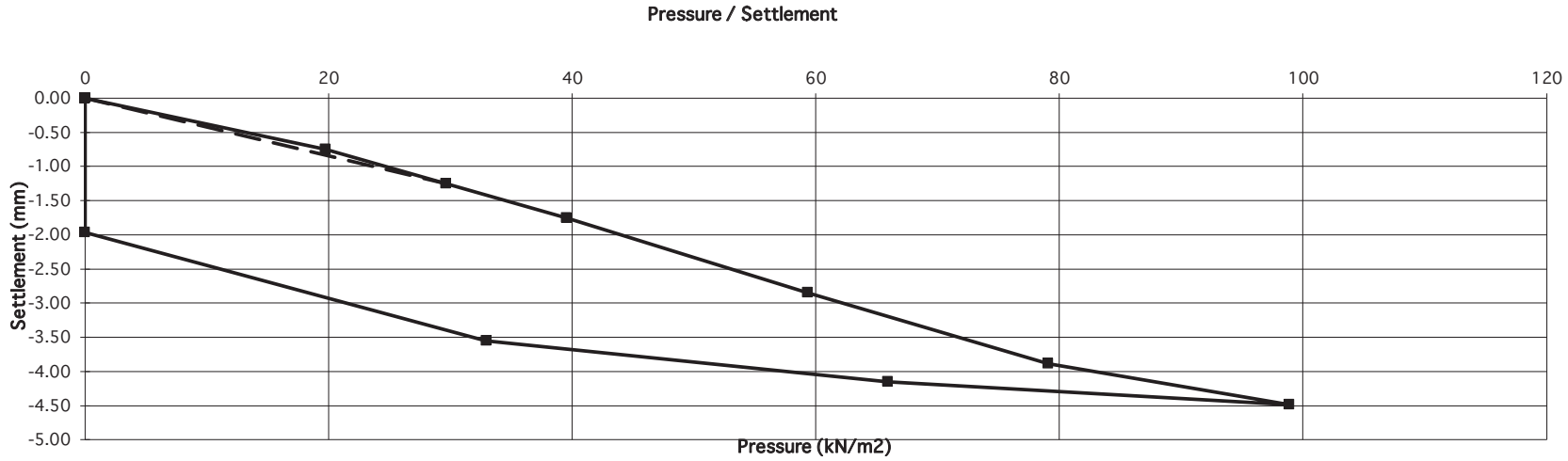
PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve
Reference No.	R127781	
Contract	Ballyouster	
Test No.	PBT 3 Load	
Location	See site map	
Depth	350 mm	
Client	DBFL	
Plate Diameter:	450 mm	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	
Technician	S.Hannon	
Authorised by		
Date	28/10/2021	

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 24
Modulus of subgrade reaction = 15 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.1 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

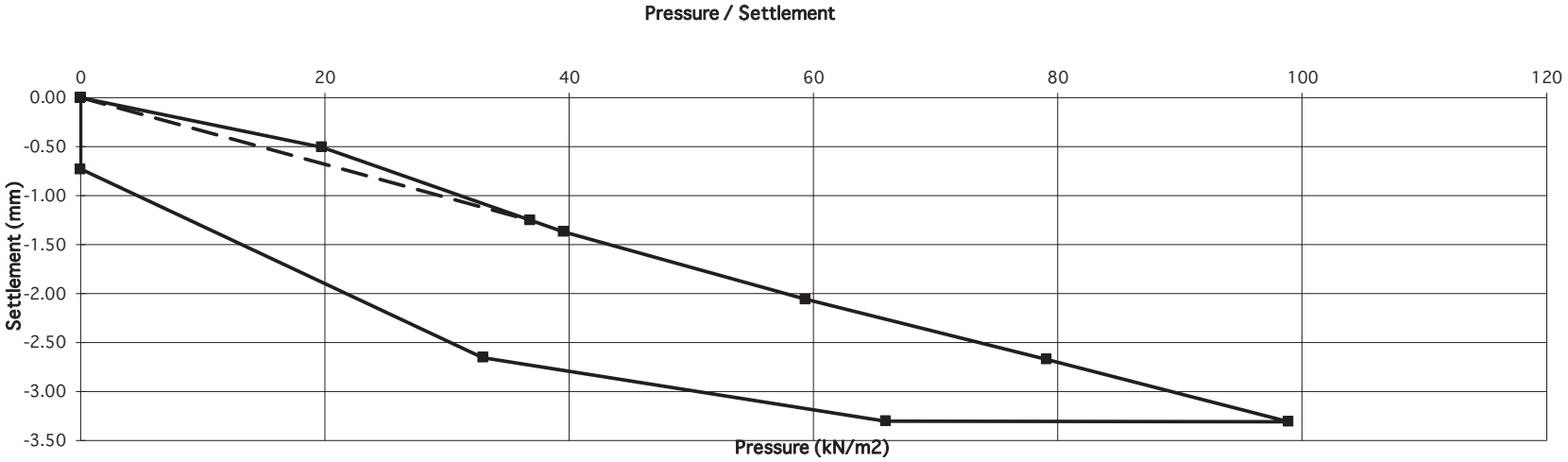
Reference No.	R127781
Contract	Ballyouster
Test No.	PBT 3 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test (natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

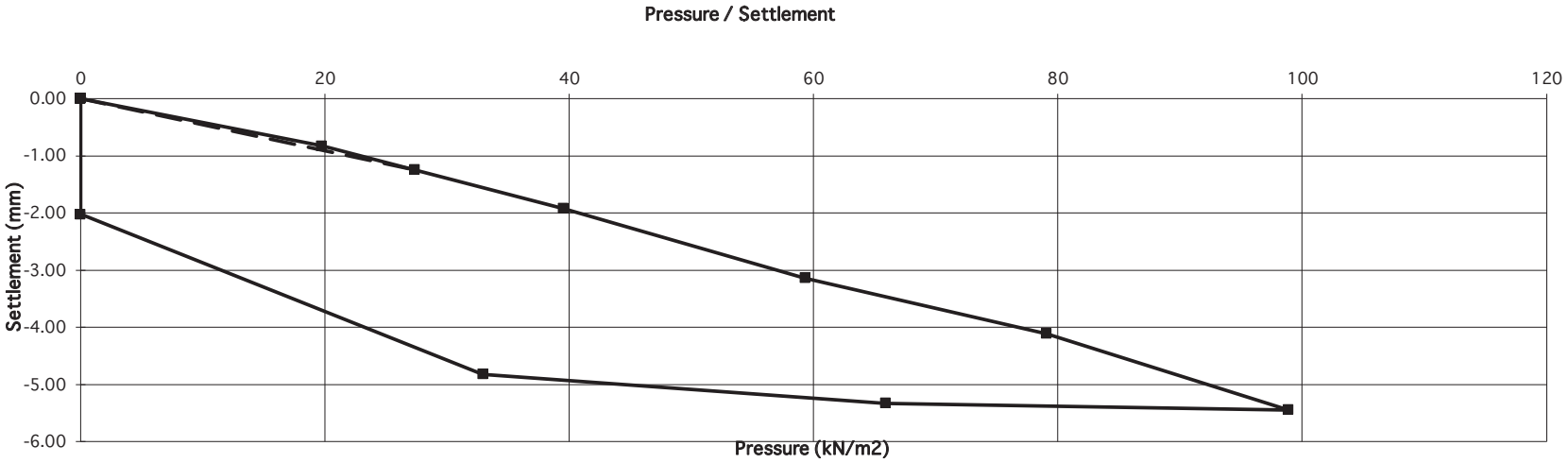
Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 29
Modulus of subgrade reaction = 19 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.6 %

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127782		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 4 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm		
Client	DBFL	Easting (m)	
Plate Diameter:	450 mm	Northing (m)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Ground Level (mOD)	
Technician	S.Hannon	Sample Ref No. N/A	
Authorised by		Depth 0.00 m bgl	
Date	28/10/2021		



Gradient at 1.25 mm settlement intersection = 22
Modulus of subgrade reaction = 14 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.9 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

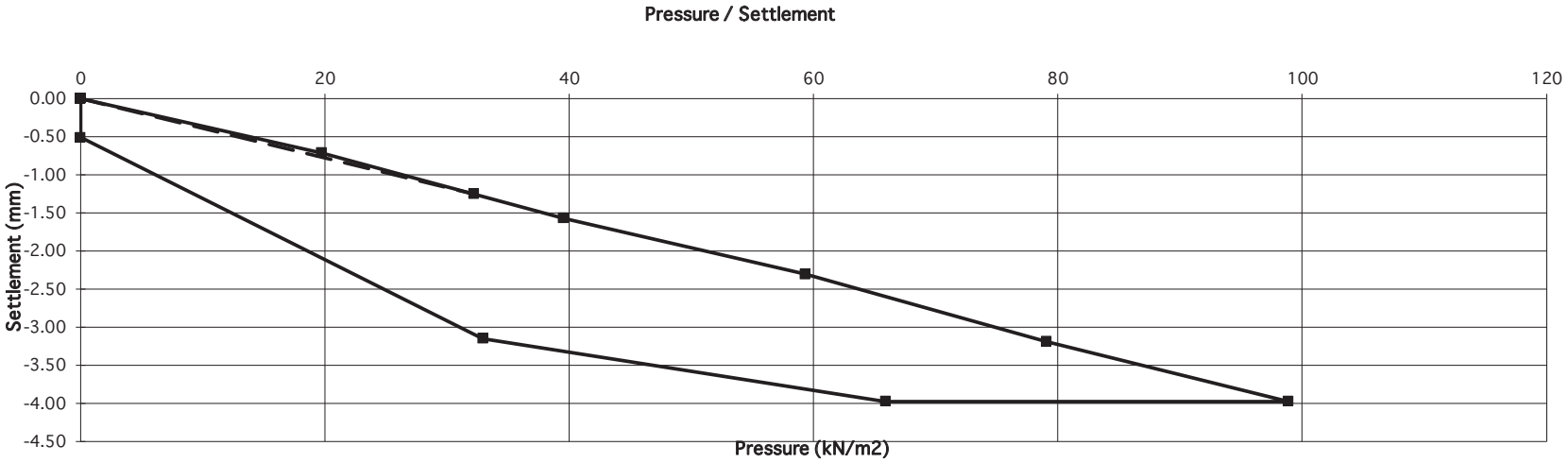
Reference No.	R127782
Contract	Ballyouster
Test No.	PBT 4 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 26
Modulus of subgrade reaction = 17 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.3 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

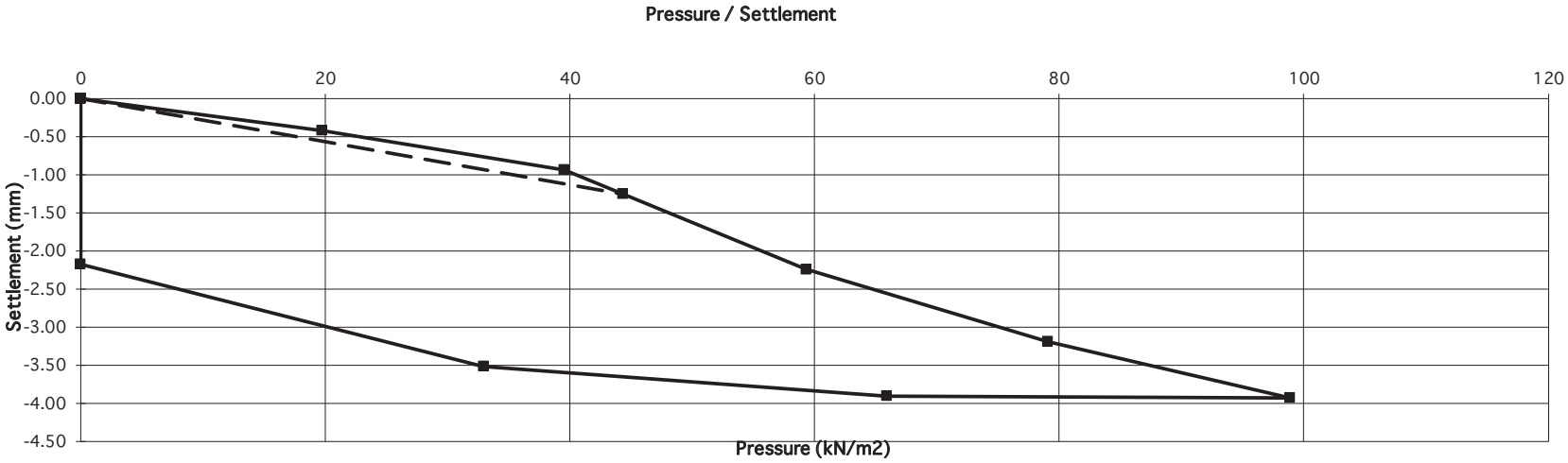
Reference No.	R127783
Contract	Ballyouster
Test No.	PBT 5 Load
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 35
Modulus of subgrade reaction = 23 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.2 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

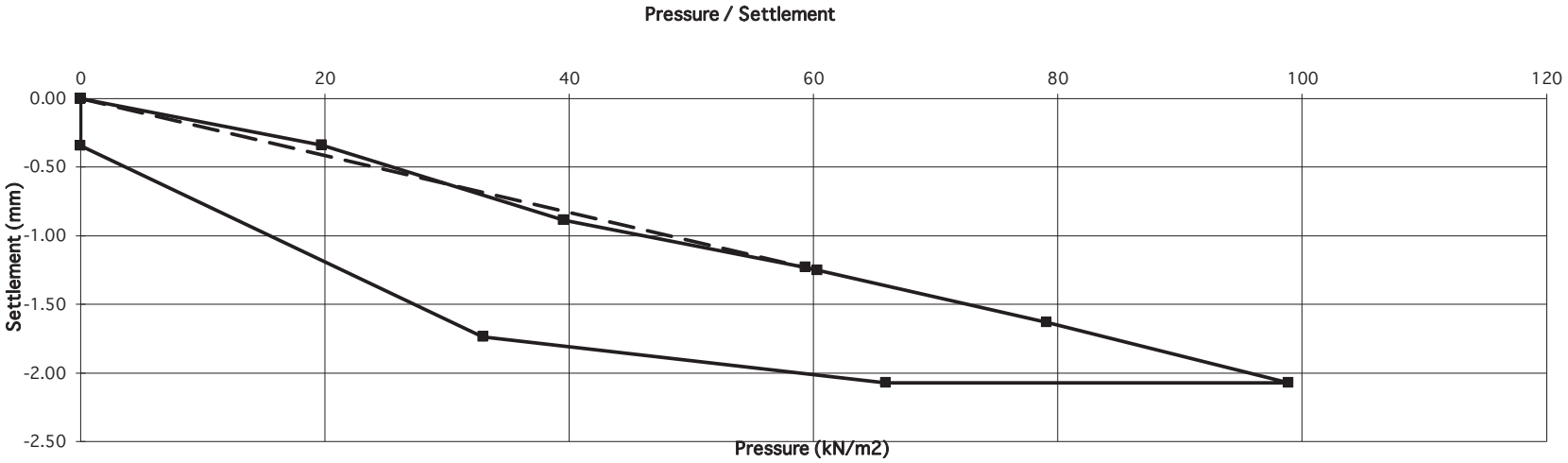
Reference No.	R127783
Contract	Ballyouster
Test No.	PBT 5 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

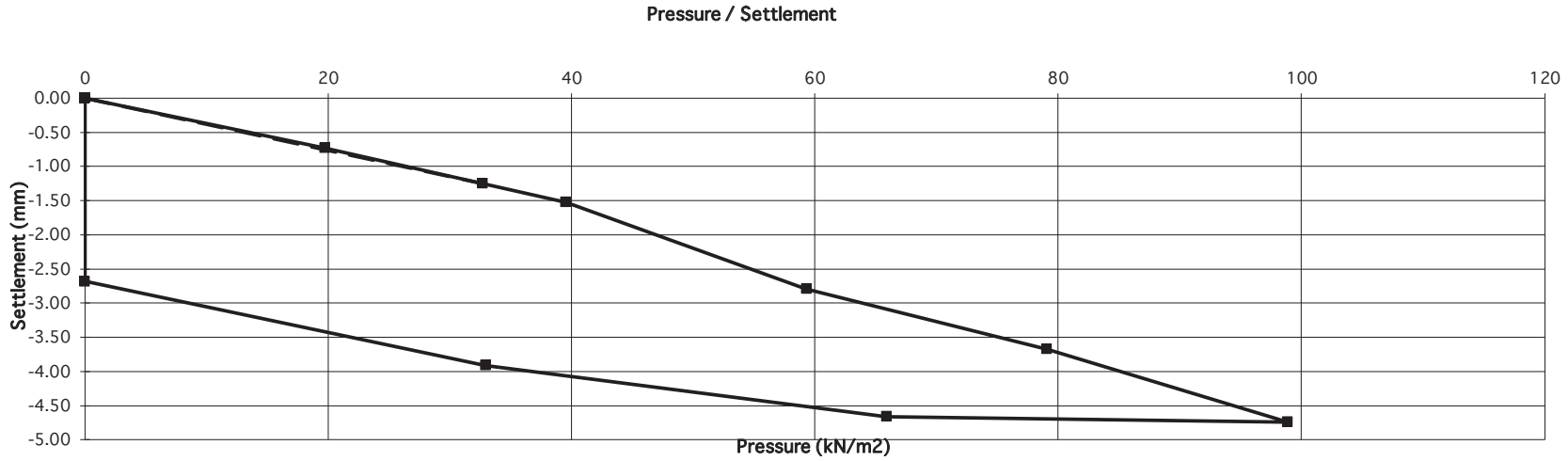
Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 48
Modulus of subgrade reaction = 31 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 3.7 %

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127784		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 6 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm	Easting (m)	
Client	DBFL	Northing (m)	
Plate Diameter:	450 mm	Ground Level (mOD)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Sample Ref No. N/A	
Technician	S.Hannon	Depth 0.00 m bgl	
Authorised by			
Date	10/28/2021		



Gradient at 1.25 mm settlement intersection = 26
Modulus of subgrade reaction = 17 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.3 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

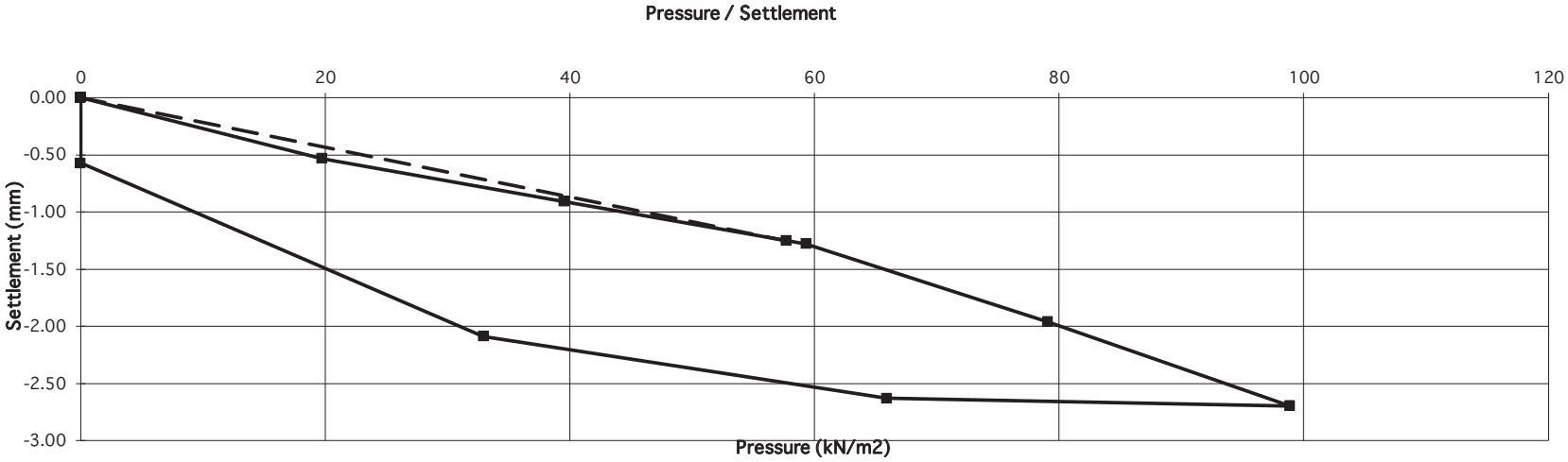
Reference No.	R127784
Contract	Ballyouster
Test No.	PBT 6 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

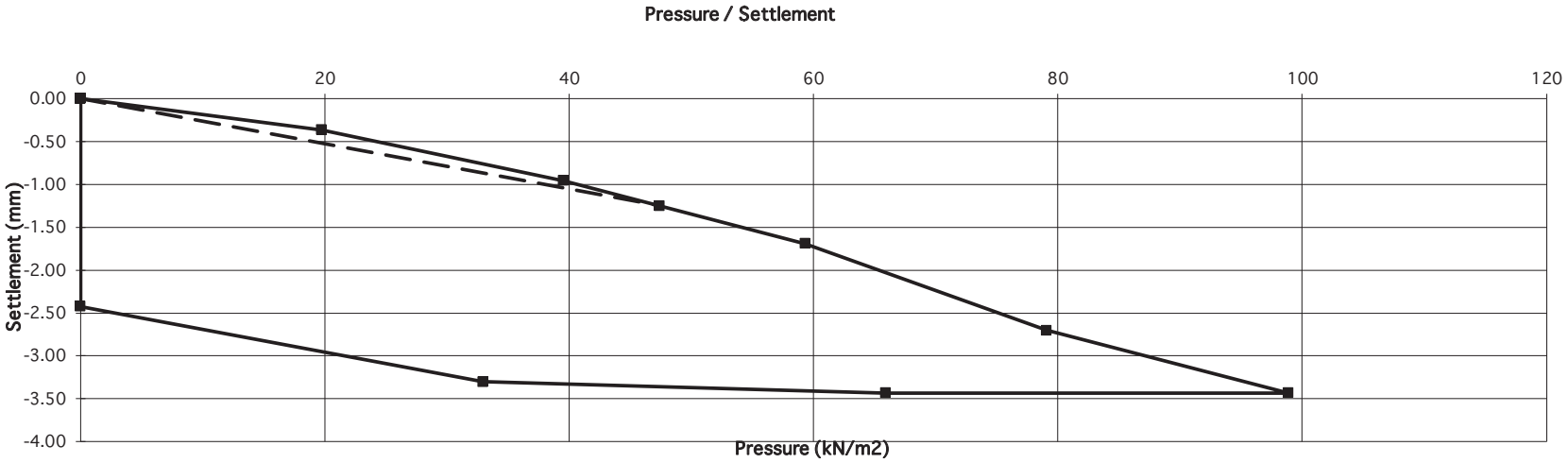
Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 46
Modulus of subgrade reaction = 30 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 3.4 %

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127785		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 7 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm	Easting (m)	
Client	DBFL	Northing (m)	
Plate Diameter:	450 mm	Ground Level (mOD)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Sample Ref No. N/A	
Technician	S.Hannon	Depth 0.00 m bgl	
Authorised by			
Date	28/10/2021		



Gradient at 1.25 mm settlement intersection = 38
Modulus of subgrade reaction = 24 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.4 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

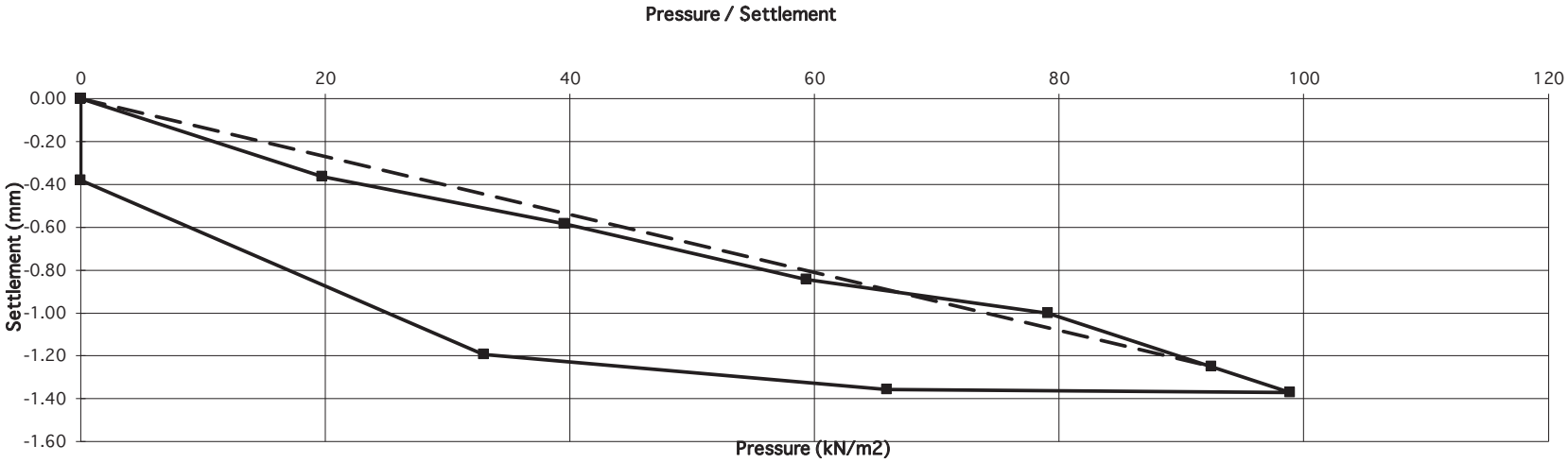
Reference No.	R127785
Contract	Ballyouster
Test No.	PBT 7 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

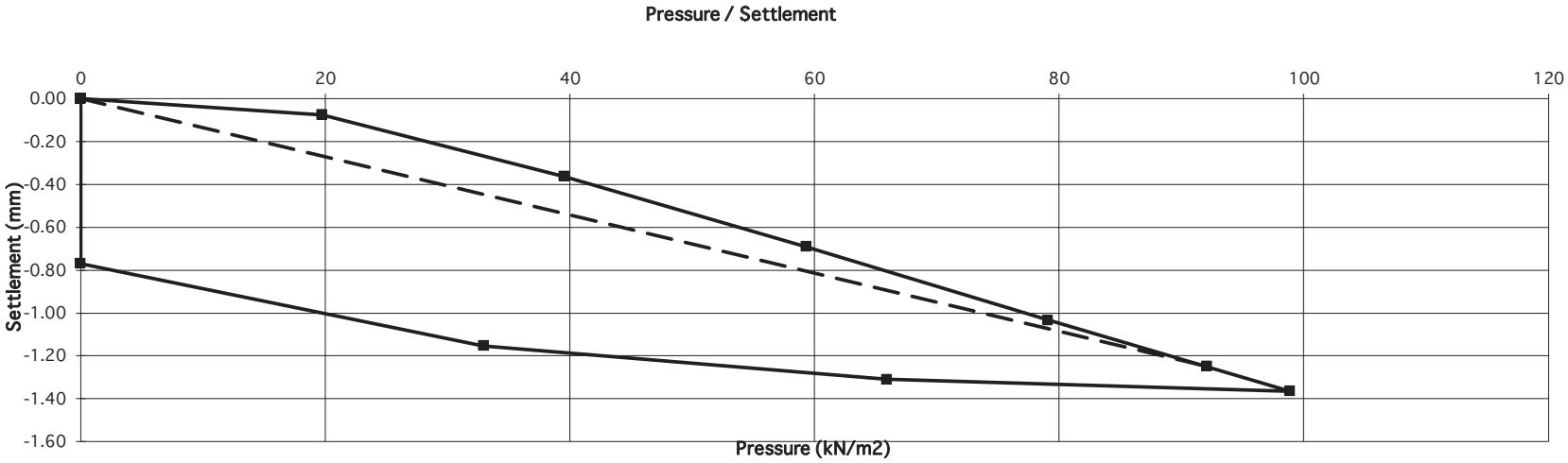
Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 74
Modulus of subgrade reaction = 48 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 7.8 %

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R127786		
Contract	Ballyouster	Description of soil under test (natural soil, placed fill, sub-base)	
Test No.	PBT 8 Load	Brown sandy gravelly CLAY	
Location	See site map		
Depth	350 mm		
Client	DBFL	Easting (m)	
Plate Diameter:	450 mm	Northing (m)	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Ground Level (mOD)	
Technician	S.Hannon	Sample Ref No. N/A	
Authorised by		Depth 0.00 m bgl	
Date	28/10/2021		



Gradient at 1.25 mm settlement intersection = 74
Modulus of subgrade reaction = 47 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 7.7 %

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

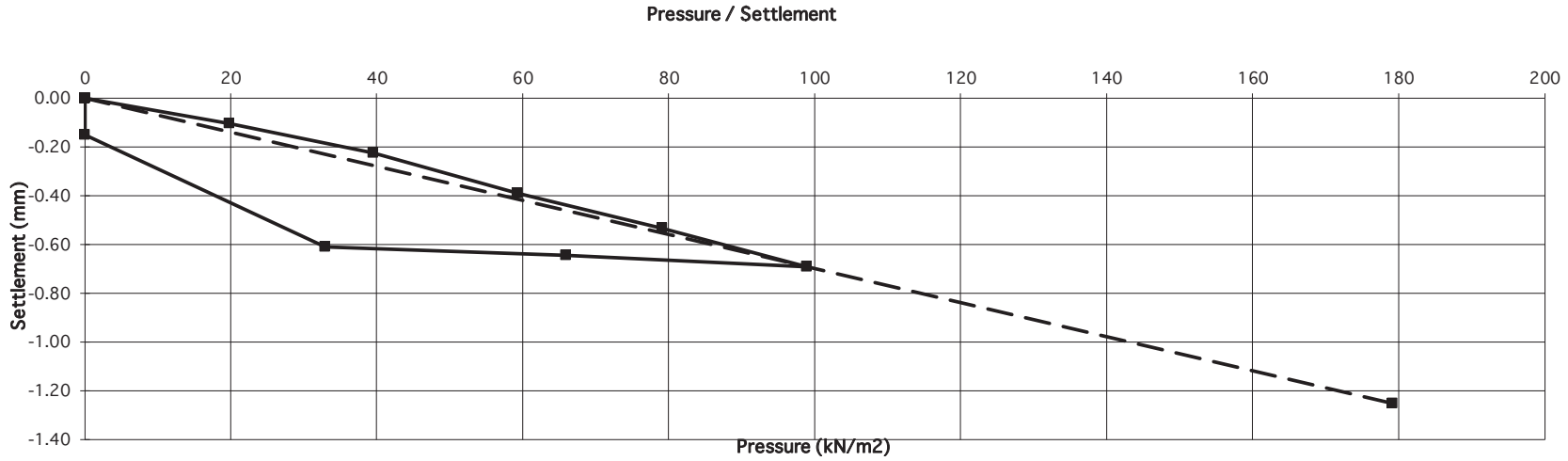
Reference No.	R127786
Contract	Ballyouster
Test No.	PBT 8 Reload
Location	See site map
Depth	350 mm
Client	DBFL
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	S.Hannon
Authorised by	
Date	28/10/2021

Description of soil under test (natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Easting (m)
Northing (m)
Ground Level (mOD)

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 143
Modulus of subgrade reaction = 92 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 24.5 %

Appendix 5 Infiltration Test Results

Soakaway Design f -value from field tests

(F2C) IGSL

Contract: Ballyoulster, Celbridge — Contract No. 23679
Test No. SA01
Client HWBC LTD
Date: 04/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.80	Firm Brown slightly sandy gravelly CLAY	
0.80	1.50	Firm greyish brown slightly sandy gravelly CLAY	
1.50	1.80	Firm becoming stiff grey slightly sandy gravelly CLAY	

Notes:

Field Data

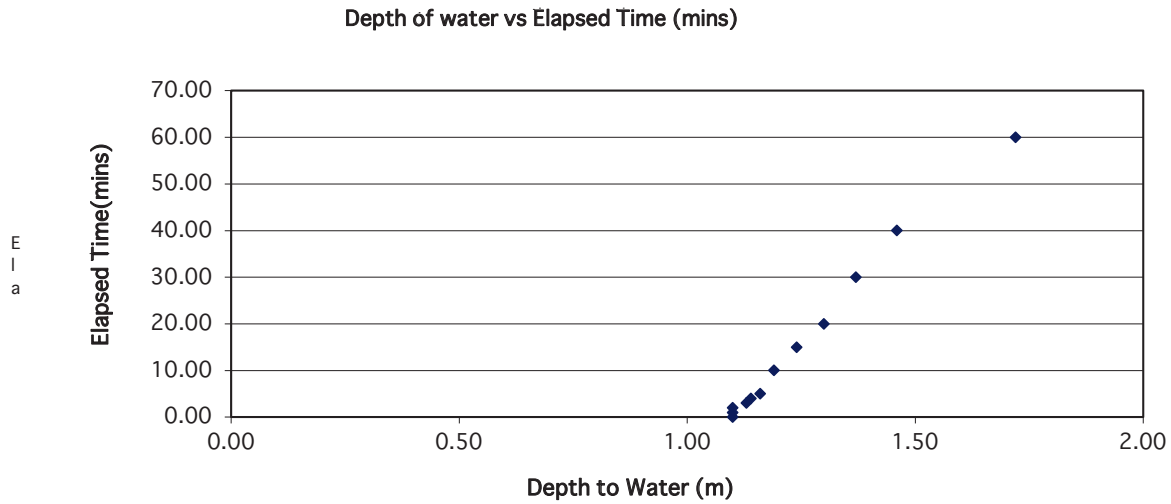
Depth to Water (m)	Elapsed Time (min)
1.10	0.00
1.10	1.00
1.10	2.00
1.13	3.00
1.14	4.00
1.16	5.00
1.19	10.00
1.24	15.00
1.30	20.00
1.37	30.00
1.46	40.00
1.72	60.00

Field Test

Depth of Pit (D)	1.80	m
Width of Pit (B)	0.30	m
Length of Pit (L)	1.80	m
Initial depth to Water =	1.10	m
Final depth to water =	1.72	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.54	m2
*Av. side area of permeable stratum over test period=	1.638	m2
Total Exposed area =	2.178	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00256 m/min or 4.26997E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster, Celbridge Contract No. 23679
Test No. SA02
Client HWBC LTD
Date: 04/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.40	TOPSOIL	
0.40	1.00	Firm brown slightly sandy CLAY	Dry
1.00	1.50	Firm brownish grey slightly sandy gravelly CLAY	

Notes:

Field Data

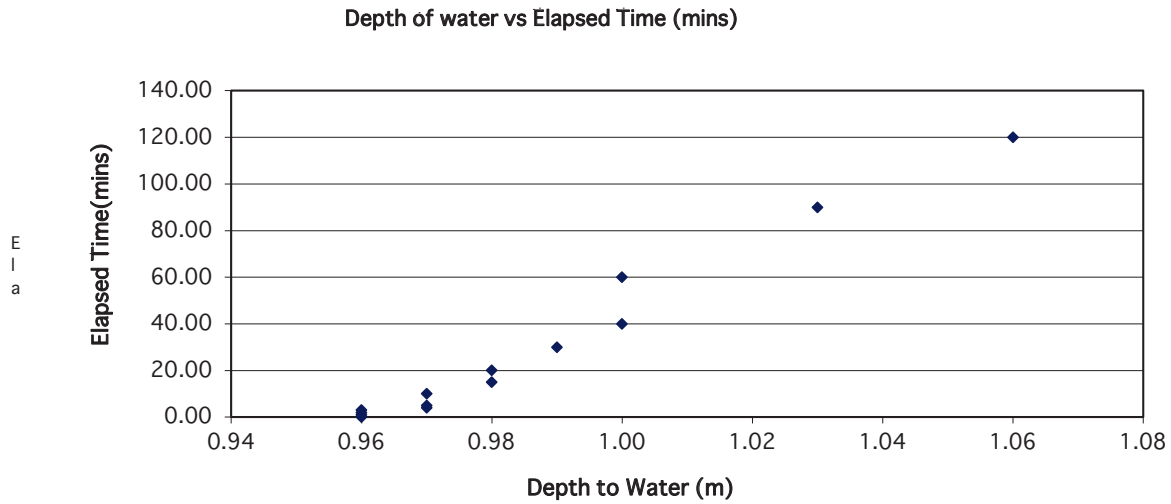
Depth to Water (m)	Elapsed Time (min)
0.96	0.00
0.96	1.00
0.96	2.00
0.96	3.00
0.97	4.00
0.97	5.00
0.97	10.00
0.98	15.00
0.98	20.00
0.99	30.00
1.00	40.00
1.00	60.00
1.03	90.00
1.06	120.00

Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.30	m
Initial depth to Water =	0.96	m
Final depth to water =	1.06	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.69	m2
*Av. side area of permeable stratum over test period=	2.561	m2
Total Exposed area =	3.251	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00017 m/min or 2.80042E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster, Celbridge Contract No. 23679
Test No. SA03
Client HWBC LTD
Date: 04/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.90	Firm brown slightly sandy gravelly CLAY	Dry
0.90	1.40	Firm greyish brown gravelly CLAY	

Notes:

Field Data

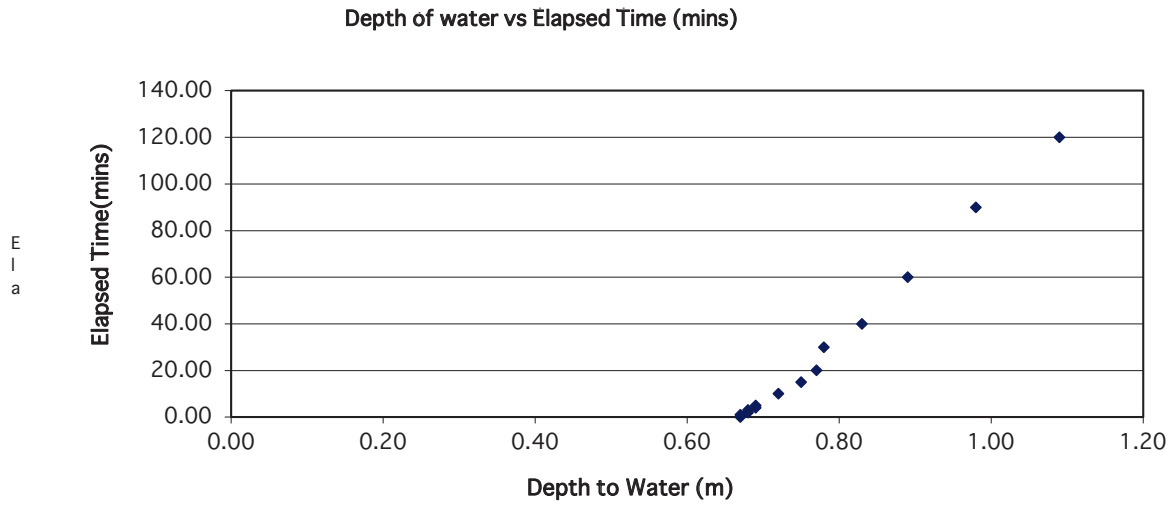
Depth to Water (m)	Elapsed Time (min)
0.67	0.00
0.67	1.00
0.68	2.00
0.68	3.00
0.69	4.00
0.69	5.00
0.72	10.00
0.75	15.00
0.77	20.00
0.78	30.00
0.83	40.00
0.89	60.00
0.98	90.00
1.09	120.00

Field Test

Depth of Pit (D)	1.40	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.40	m
Initial depth to Water =	0.67	m
Final depth to water =	1.09	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.72	m2
*Av. side area of permeable stratum over test period=	2.808	m2
Total Exposed area =	3.528	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00071 m/min or 1.19048E-05 m/sec



Soakaway Design f -value from field tests

(F2C) IGSL

Contract: Ballyoulster, Celbridge — Contract No. 23679
Test No. SA04
Client HWBC LTD
Date: 04/11/2022

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.80	Firm brown slightly sandy gravelly CLAY	
0.80	1.30	Firm greyish brown slightly sandy gravelly CLAY	
1.30	1.70	Firm becoming stiff grey slightly sandy gravelly CLAY	

Notes:

Field Data

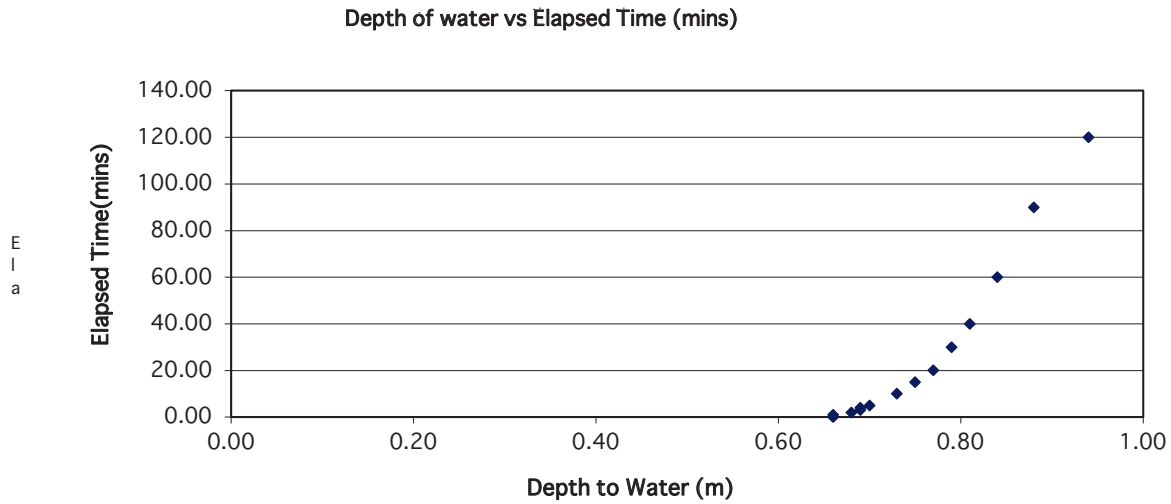
Depth to Water (m)	Elapsed Time (min)
0.66	0.00
0.66	1.00
0.68	2.00
0.69	3.00
0.69	4.00
0.70	5.00
0.73	10.00
0.75	15.00
0.77	20.00
0.79	30.00
0.81	40.00
0.84	60.00
0.88	90.00
0.94	120.00

Field Test

Depth of Pit (D)	1.70	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.30	m
Initial depth to Water =	0.66	m
Final depth to water =	0.94	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.69	m2
*Av. side area of permeable stratum over test period=	4.68	m2
Total Exposed area =	5.37	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.0003 m/min or 4.9969E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster, Celbridge Contract No. 23679
Test No. SA05
Client HWBC LTD
Date: 05/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.80	Firm brown slightly sandy gravelly CLAY	
0.80	1.30	Firm brownish grey slightly sandy gravelly CLAY	

Notes:

Field Data

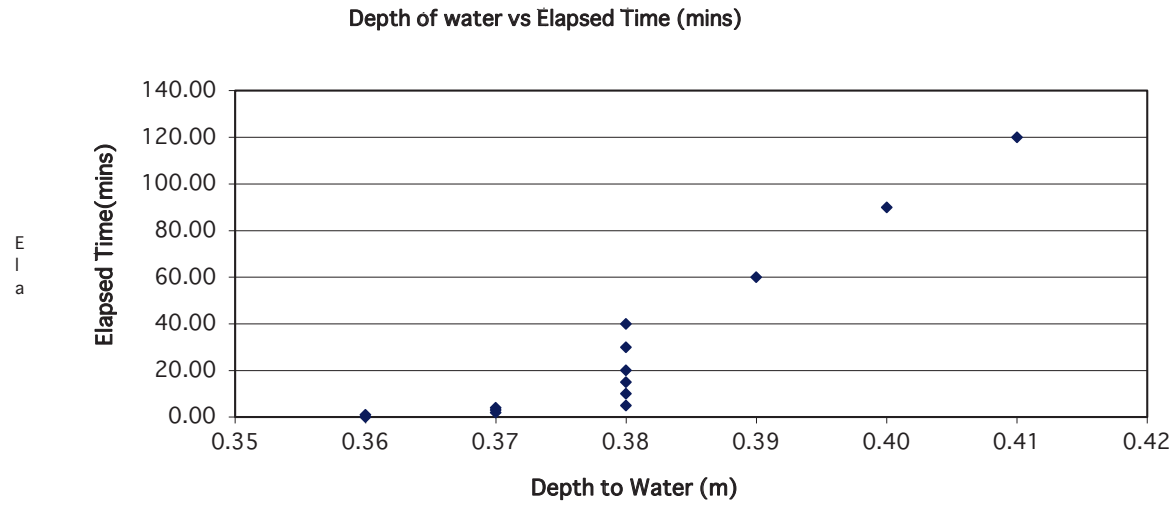
Depth to Water (m)	Elapsed Time (min)
0.36	0.00
0.36	1.00
0.37	2.00
0.37	3.00
0.37	4.00
0.38	5.00
0.38	10.00
0.38	15.00
0.38	20.00
0.38	30.00
0.38	40.00
0.39	60.00
0.40	90.00
0.41	120.00

Field Test

Depth of Pit (D)	1.30	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.50	m
Initial depth to Water =	0.36	m
Final depth to water =	0.41	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.75	m2
*Av. side area of permeable stratum over test period=	5.124	m2
Total Exposed area =	5.874	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 5.3E-05 m/min or 8.86676E-07 m/sec



Soakaway Design f -value from field tests

(F2C) IGSL

Contract: Ballyoulster, Celbridge — Contract No. 23679
Test No. SA06
Client HWBC LTD
Date: 05/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.80	Firm grey slightly sandy gravelly CLAY	
0.80	1.10	Firm becoming stiff slightly sandy gravelly CLAY	

Notes:

Field Data

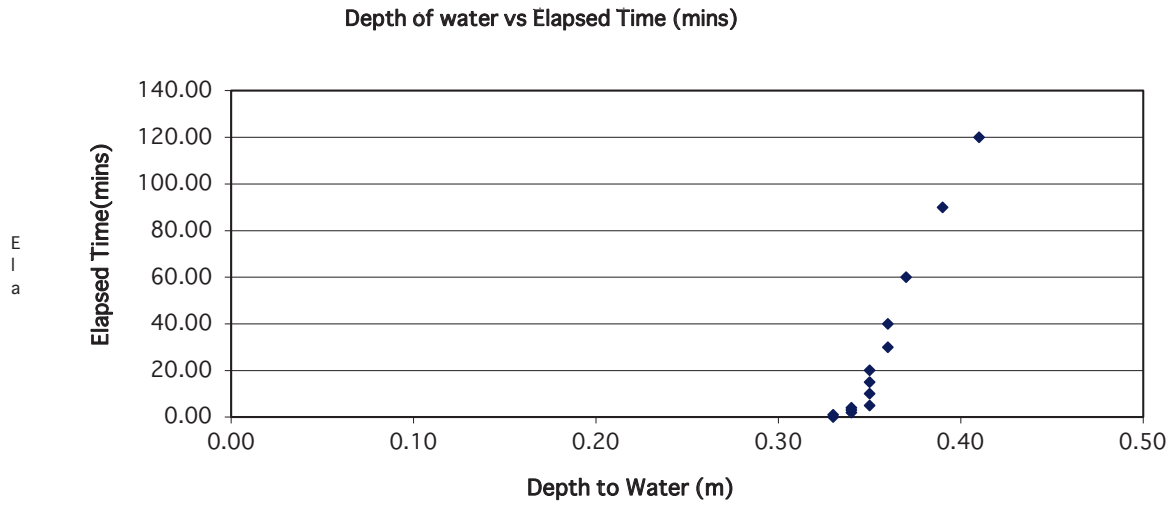
Depth to Water (m)	Elapsed Time (min)
0.33	0.00
0.33	1.00
0.34	2.00
0.34	3.00
0.34	4.00
0.35	5.00
0.35	10.00
0.35	15.00
0.35	20.00
0.36	30.00
0.36	40.00
0.37	60.00
0.39	90.00
0.41	120.00

Field Test

Depth of Pit (D)	1.10	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.50	m
Initial depth to Water =	0.33	m
Final depth to water =	0.41	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.75	m2
*Av. side area of permeable stratum over test period=	4.088	m2
Total Exposed area =	4.838	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.0001 m/min or 1.72247E-06 m/sec



Soakaway Design f -value from field tests

(F2C) IGSL

Contract: Ballyoulster, Celbridge — Contract No. 23679
Test No. SA07
Client HWBC LTD
Date: 05/11/2022

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.60	Firm brown slightly sandy gravelly CLAY	
0.60	0.90	Firm greyish brown slightly sandy gravelly CLAY	
0.90	1.20	Stiff grey slightly sandy gravelly CLAY	

Notes:

Field Data

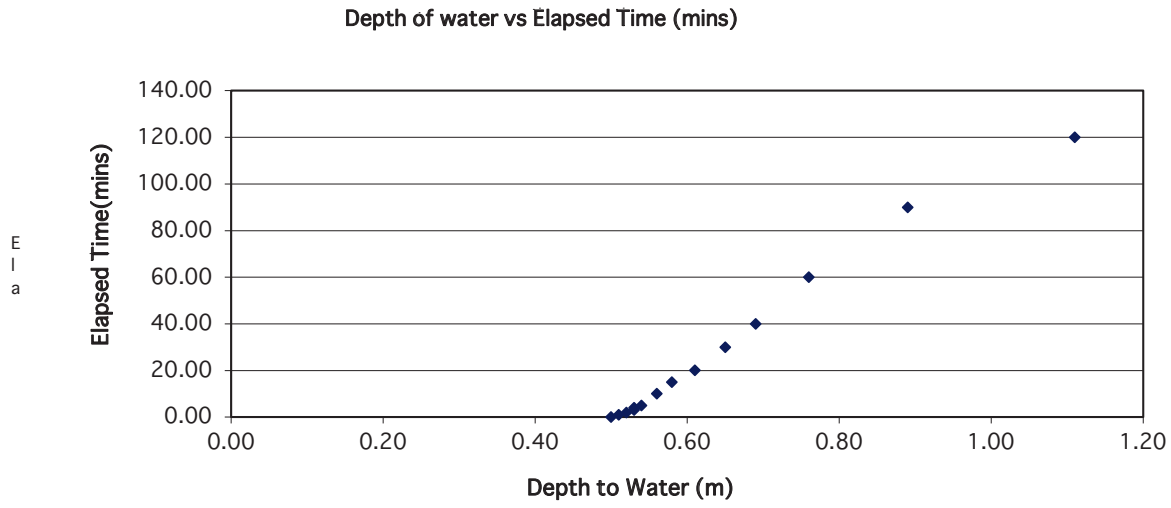
Depth to Water (m)	Elapsed Time (min)
0.50	0.00
0.51	1.00
0.52	2.00
0.53	3.00
0.53	4.00
0.54	5.00
0.56	10.00
0.58	15.00
0.61	20.00
0.65	30.00
0.69	40.00
0.76	60.00
0.89	90.00
1.11	120.00

Field Test

Depth of Pit (D)	1.20	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.60	m
Initial depth to Water =	0.50	m
Final depth to water =	1.11	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.78	m2
*Av. side area of permeable stratum over test period=	2.291	m2
Total Exposed area =	3.071	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00129 m/min or 2.15185E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster, Celbridge Contract No. 23679
Test No. SA08
Client HWBC LTD
Date: 05/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.90	Firm greyish brown slightly sandy gravelly CLAY	Dry
0.90	1.20	Firm becoming stiff grey slightly sandy gravelly CLAY	

Notes:

Field Data

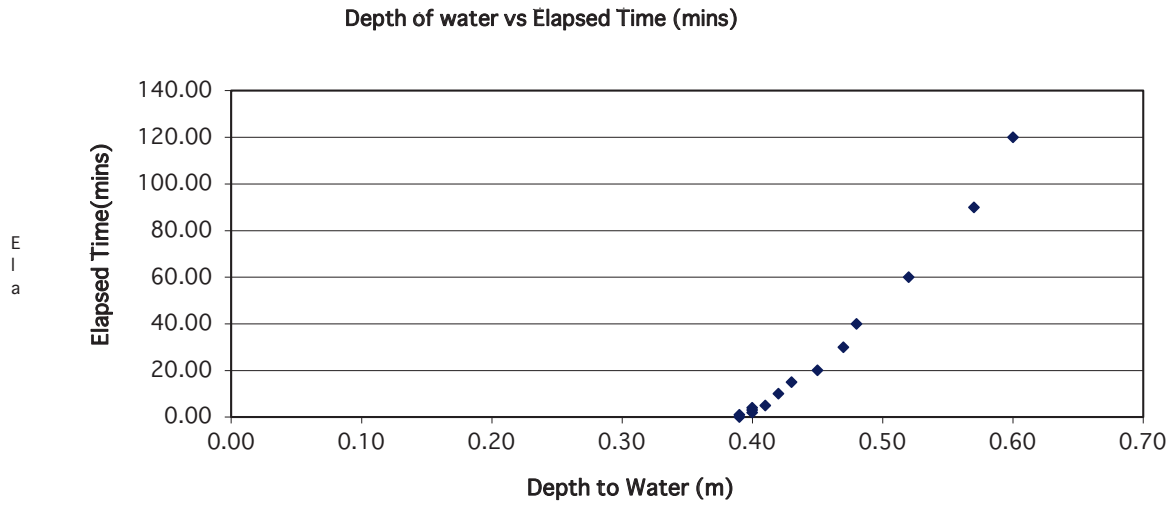
Depth to Water (m)	Elapsed Time (min)
0.39	0.00
0.39	1.00
0.40	2.00
0.40	3.00
0.40	4.00
0.41	5.00
0.42	10.00
0.43	15.00
0.45	20.00
0.47	30.00
0.48	40.00
0.52	60.00
0.57	90.00
0.60	120.00

Field Test

Depth of Pit (D)	1.20	m
Width of Pit (B)	0.30	m
Length of Pit (L)	2.60	m
Initial depth to Water =	0.39	m
Final depth to water =	0.60	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.78	m2
*Av. side area of permeable stratum over test period=	4.089	m2
Total Exposed area =	4.869	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00028 m/min or 4.67242E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster Contract No. 23679
Test No. SA09
Client HWBC LTD
Date: 0.3.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.40	TOPSOIL	
0.40	0.60	Firm brown slightly sandy gravelly clay with occasional cobbles.	Dry
0.60	0.90	Firm grey slightly sandy gravelly clay with low cobble content.	
0.90	1.10	Stiff grey sandy gravelly clay with some cobbles and boulders.	
		Refusal at 1.1M	

Notes:

Field Data

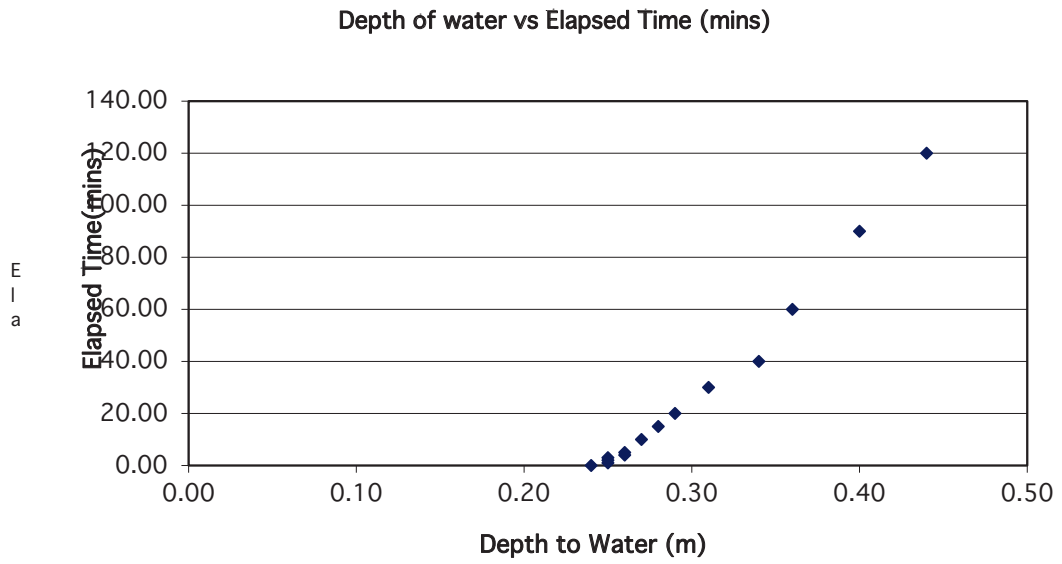
Depth to Water (m)	Elapsed Time (min)
0.24	0.00
0.25	1.00
0.25	2.00
0.25	3.00
0.26	4.00
0.26	5.00
0.27	10.00
0.28	15.00
0.29	20.00
0.31	30.00
0.34	40.00
0.36	60.00
0.40	90.00
0.44	120.00

Field Test

Depth of Pit (D)	1.10	m
Width of Pit (B)	0.70	m
Length of Pit (L)	2.80	m
Initial depth to Water =	0.24	m
Final depth to water =	0.44	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.96	m2
*Av. side area of permeable stratum over test period	5.32	m2
Total Exposed area =	7.28	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00045 m/min or 7.479E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA10
Client HWBC LTD
Date: 11.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	
0.25	1.60	Firm brown slightly sandy slightly gravelly clay with low cobble conten	Dry
		Refusal on angular tabular weathered rockhead. Clay smear from the	
		bucket may have reduced permeability of the rockhead in this scenario.	

Field Data

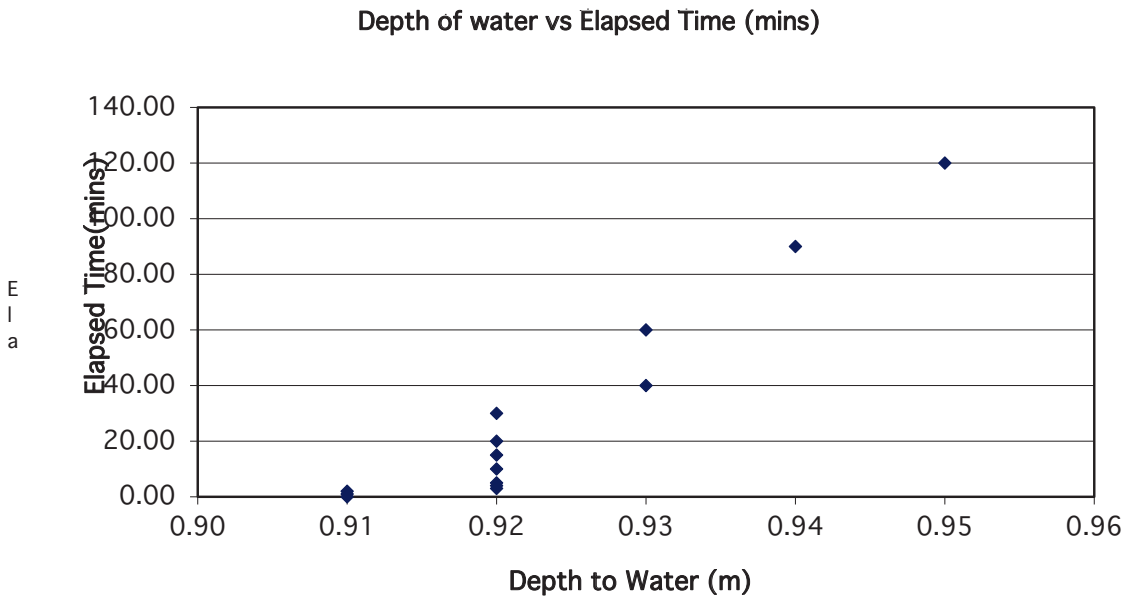
Depth to Water (m)	Elapsed Time (min)
0.91	0.00
0.91	1.00
0.91	2.00
0.92	3.00
0.92	4.00
0.92	5.00
0.92	10.00
0.92	15.00
0.92	20.00
0.92	30.00
0.93	40.00
0.93	60.00
0.94	90.00
0.95	120.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.70	m
Length of Pit (L)	2.30	m
Initial depth to Water =	0.91	m
Final depth to water =	0.95	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.61	m2
*Av. side area of permeable stratum over test perio	4.02	m2
Total Exposed area =	5.63	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 9.5E-05 m/min or 1.589E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Lidl Development, Dundalk Contract No. 23706
Test No. SA11
Client: Lidl GmbH
Date: 6/11/2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.60	MADE GROUND comprised of grey sandy gravelly COBBLES	None observed
0.60	0.90	MADE GROUND comprised of greyish brown slightly clayey sandy gravelly COBBLES with occasional boulders. Also contains metal and plastic pipes	
0.90	1.50	Soft to firm greenish grey mottled brown slightly sandy slightly gravelly SILT	

Notes:

Field Data

Depth to Water (m)	Elapsed Time (min)
0.56	0.00
0.56	1.00
0.56	2.00
0.56	3.00
0.56	4.00
0.56	5.00
0.56	6.00
0.56	7.00
0.56	8.00
0.56	9.00
0.56	10.00
0.56	12.00
0.56	14.00
0.56	16.00
0.56	18.00
0.56	20.00
0.56	25.00
0.56	30.00
0.56	40.00
0.56	50.00
0.56	60.00
0.56	70.00

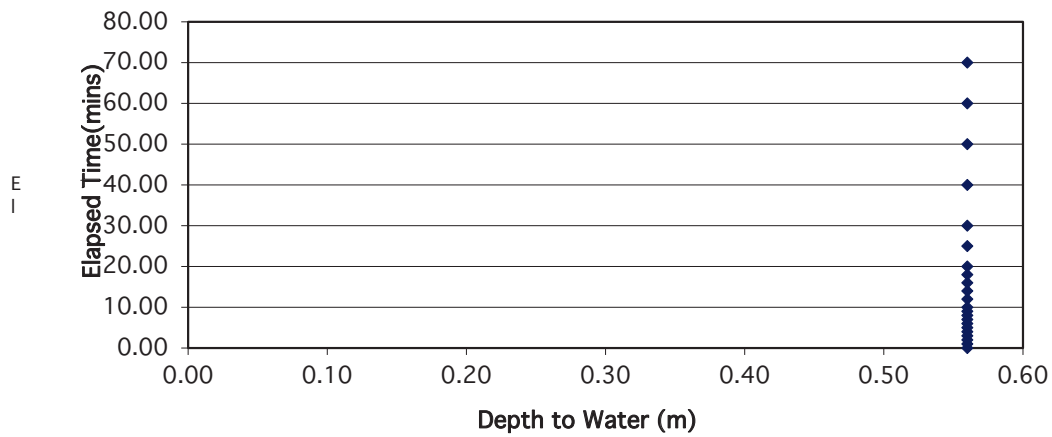
Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	0.60	m
Length of Pit (L)	1.40	m
Initial depth to Water =	0.56	m
Final depth to water =	0.56	m
Elapsed time (mins)=	70.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.84	m2
*Av. side area of permeable stratum over test perio	3.76	m2
Total Exposed area =	4.6	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster Contract No. 23679
Test No. SA12
Client HWBC LTD
Date: 03.11.21

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.70	Firm brown slightly sandy gravelly clay with occasional cobbles.	Dry
0.70	1.00	Firm brown grey slightly sandy gravelly clay with low cobble content.	
1.00	1.35	Firm grey slightly sandy gravelly clay with low cobble content.	
1.35	1.60	Firm to stiff grey sandy gravelly clay with cobbles. Refusal at 1.6M.	

Notes:

Field Data

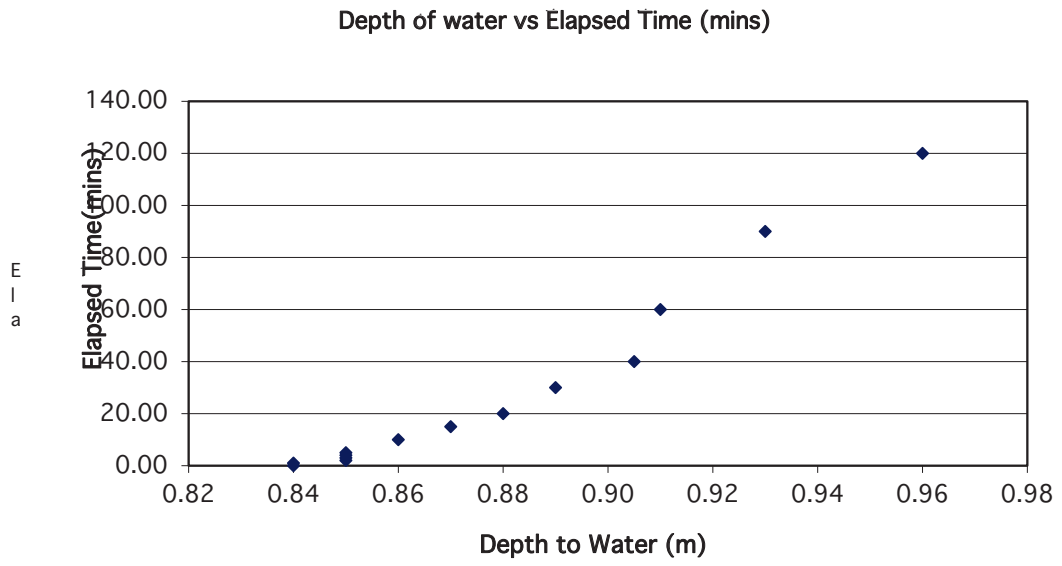
Depth to Water (m)	Elapsed Time (min)
0.84	0.00
0.84	1.00
0.85	2.00
0.85	3.00
0.85	4.00
0.85	5.00
0.86	10.00
0.87	15.00
0.88	20.00
0.89	30.00
0.91	40.00
0.91	60.00
0.93	90.00
0.96	120.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.60	m
Length of Pit (L)	2.20	m
Initial depth to Water =	0.84	m
Final depth to water =	0.96	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.32	m2
*Av. side area of permeable stratum over test period	3.92	m2
Total Exposed area =	5.24	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00025 m/min or 4.198E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA13
Client HWBC LTD
Date: 1.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	Dry
0.25	0.60	Firm brown sandy gravelly CLAY with low cobble content.	
0.60	1.20	Firm to stiff light brown slightly sandy very gravelly CLAY with low co	
1.20	1.40	weathered rock recovered as angular platey gravels with clay. Refusal at 1.4 m.	

Field Data

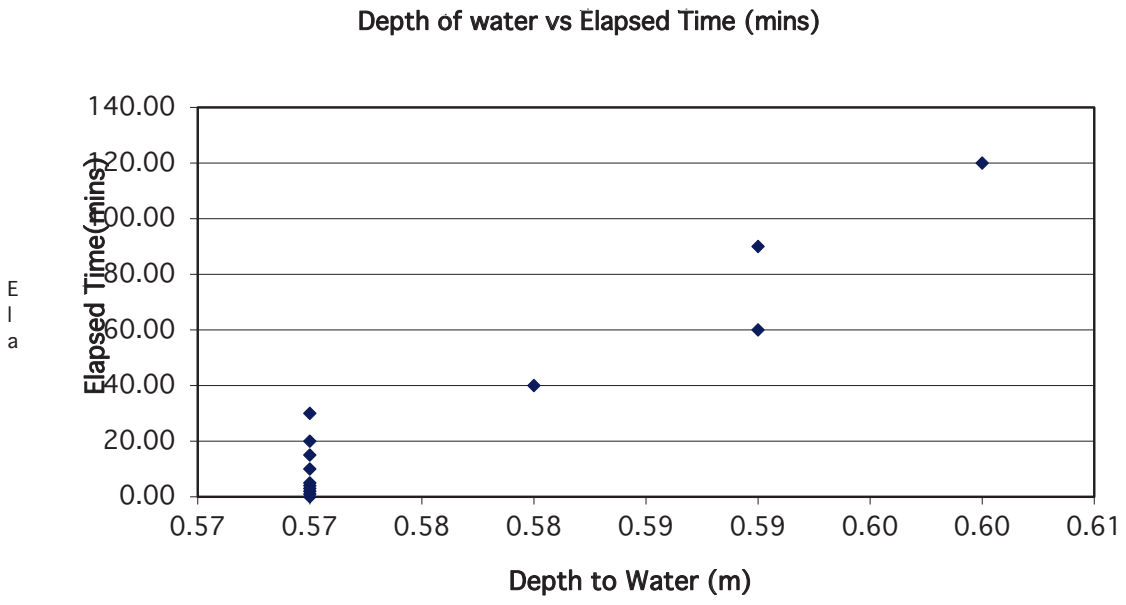
Depth to Water (m)	Elapsed Time (min)
0.57	0.00
0.57	1.00
0.57	2.00
0.57	3.00
0.57	4.00
0.57	5.00
0.57	10.00
0.57	15.00
0.57	20.00
0.57	30.00
0.58	40.00
0.59	60.00
0.59	90.00
0.60	120.00

Field Test

Depth of Pit (D)	1.10	m
Width of Pit (B)	0.90	m
Length of Pit (L)	2.40	m
Initial depth to Water =	0.57	m
Final depth to water =	0.60	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.16	m2
*Av. side area of permeable stratum over test perio	3.399	m2
Total Exposed area =	5.559	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 9.7E-05 m/min or 1.619E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA14
Client HWBC LTD
Date: 1.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	
0.25	0.70	Firm to stiff brown sandy very gravelly CLAY with high cobble conten	Dry
0.70	1.40	Stiff brownish grey sandy very gravelly CLAY with high cobble conten	
		and medium boulder content. Refusal at 1.4 on weathered rockhead.	

Field Data

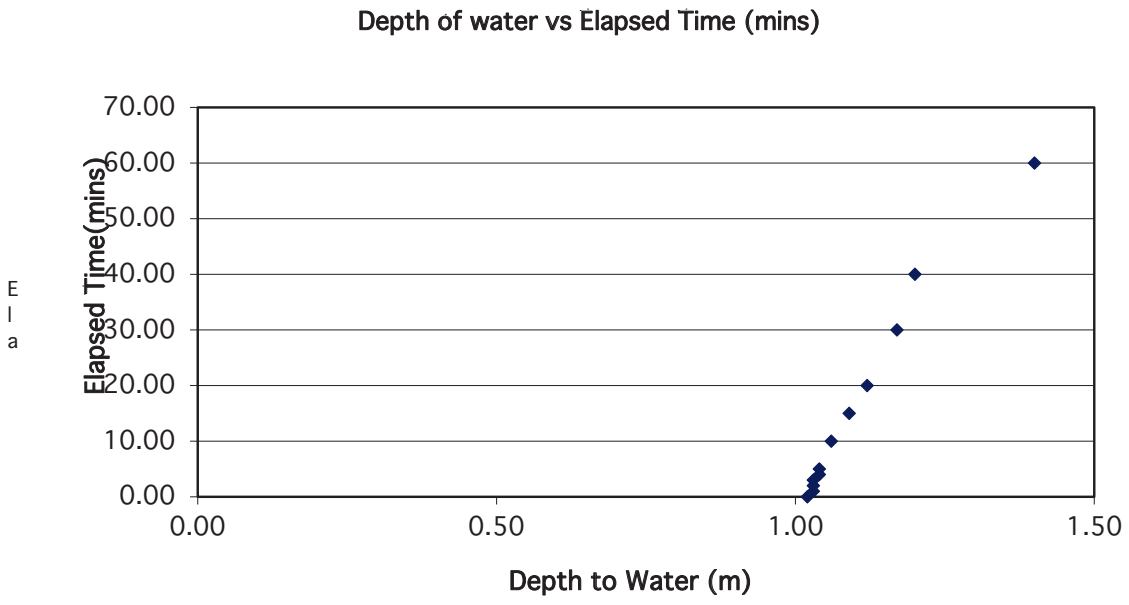
Depth to Water (m)	Elapsed Time (min)
1.02	0.00
1.03	1.00
1.03	2.00
1.03	3.00
1.04	4.00
1.04	5.00
1.06	10.00
1.09	15.00
1.12	20.00
1.17	30.00
1.20	40.00
1.40	60.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.80	m
Length of Pit (L)	2.00	m
Initial depth to Water =	1.02	m
Final depth to water =	1.40	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.6	m2
*Av. side area of permeable stratum over test perio	2.184	m2
Total Exposed area =	3.784	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00268 m/min or 4.463E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA15
Client HWBC LTD
Date: 1.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	Dry
0.30	0.80	Firm brown sandy gravelly CLAY with low cobble content.	
0.80	1.60	Stiff brownish grey slightly sandy very gravelly CLAY with medium cob	
		content and low boulder content. Refusal at 1.6 m on weathered rock.	

Field Data

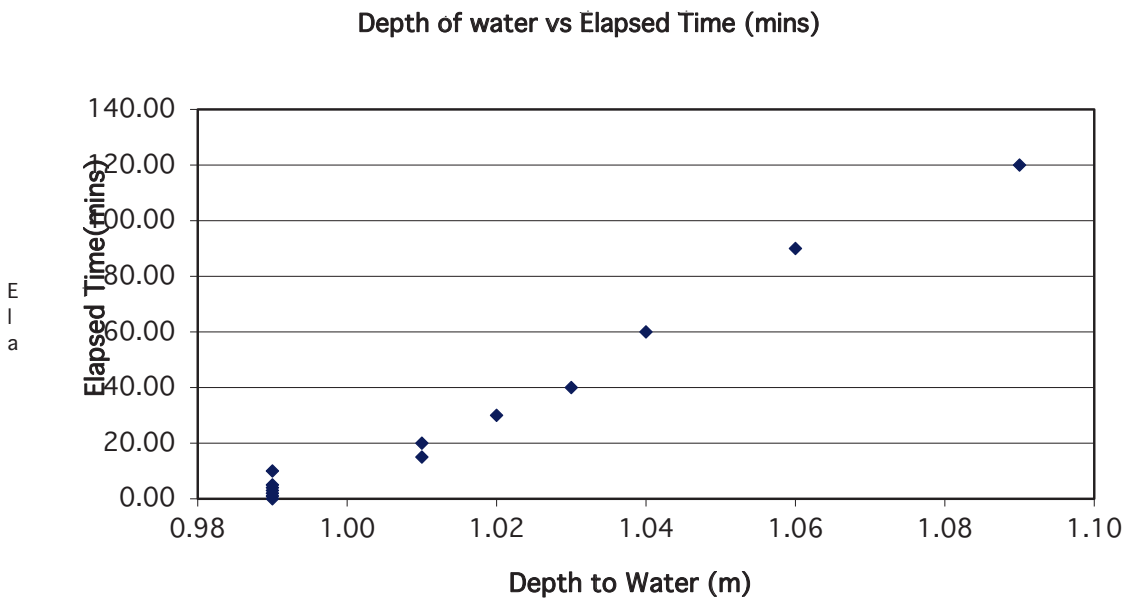
Depth to Water (m)	Elapsed Time (min)
0.99	0.00
0.99	1.00
0.99	2.00
0.99	3.00
0.99	4.00
0.99	5.00
0.99	10.00
1.01	15.00
1.01	20.00
1.02	30.00
1.03	40.00
1.04	60.00
1.06	90.00
1.09	120.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.80	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.99	m
Final depth to water =	1.09	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.6	m2
*Av. side area of permeable stratum over test perio	3.136	m2
Total Exposed area =	4.736	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00028 m/min or 4.692E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA16
Client HWBC LTD
Date: 1.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.30	Firm - stiff greysih brown slightly sandy gravelly CLAY with medium	Dry
		cobble content. Refusal at 1.3 on weathered rockhead.	

Field Data

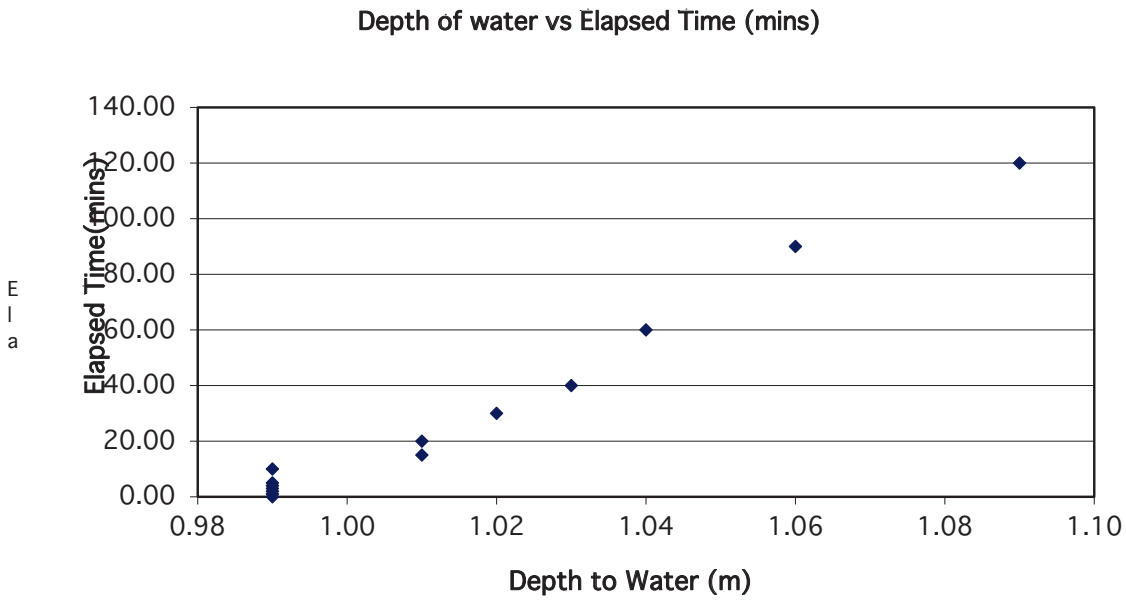
Depth to Water (m)	Elapsed Time (min)
0.99	0.00
0.99	1.00
0.99	2.00
0.99	3.00
0.99	4.00
0.99	5.00
0.99	10.00
1.01	15.00
1.01	20.00
1.02	30.00
1.03	40.00
1.04	60.00
1.06	90.00
1.09	120.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.80	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.99	m
Final depth to water =	1.09	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.6	m2
*Av. side area of permeable stratum over test perio	3.136	m2
Total Exposed area =	4.736	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00028 m/min or 4.692E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA17
Client HWBC LTD
Date: 2.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.60	Firm brown slightly sandy slightly gravelly clay.	Dry
0.60	2.20	Stiff grey slightly sandy slightly gravelly clay with low cobble content.	

Field Data

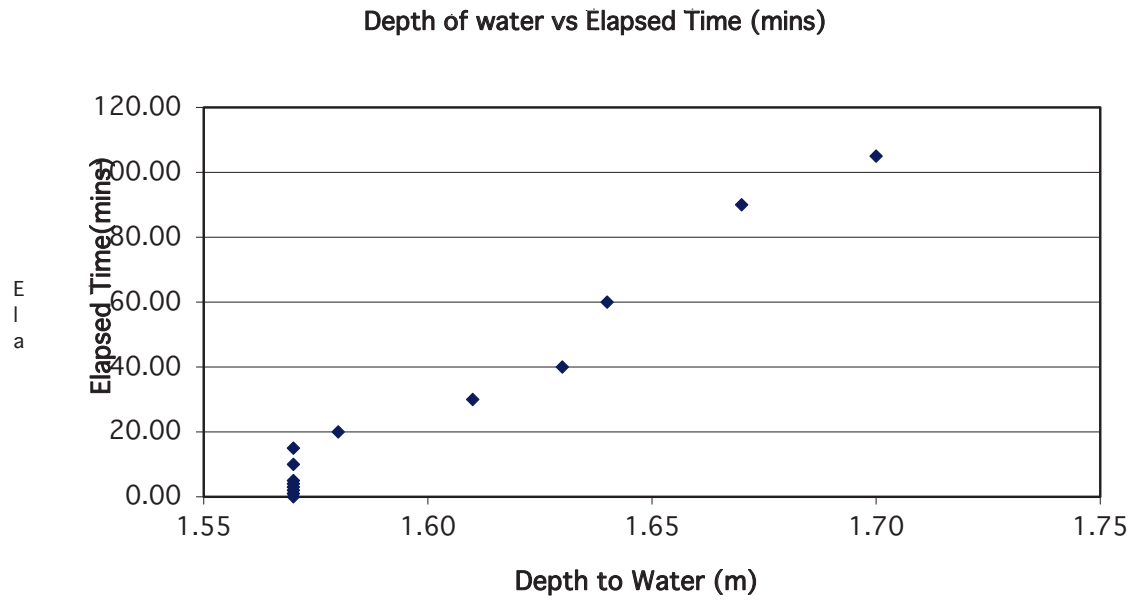
Depth to Water (m)	Elapsed Time (min)
1.57	0.00
1.57	1.00
1.57	2.00
1.57	3.00
1.57	4.00
1.57	5.00
1.57	10.00
1.57	15.00
1.58	20.00
1.61	30.00
1.63	40.00
1.64	60.00
1.67	90.00
1.70	105.00

Field Test

Depth of Pit (D)	2.20	m
Width of Pit (B)	0.60	m
Length of Pit (L)	2.30	m
Initial depth to Water =	1.57	m
Final depth to water =	1.70	m
Elapsed time (mins)=	105.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.38	m2
*Av. side area of permeable stratum over test perio	3.277	m2
Total Exposed area =	4.657	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00037 m/min or 6.115E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA18
Client HWBC LTD
Date: 2.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.30	Firm to stiff brown sandy very gravelly CLAY with high cobble conten	Seepage at 2.2
1.30	2.20	Dense grey very gravelly sand with high cobble and low boulder conte	
		Refusal at 2.2 m.	

Field Data

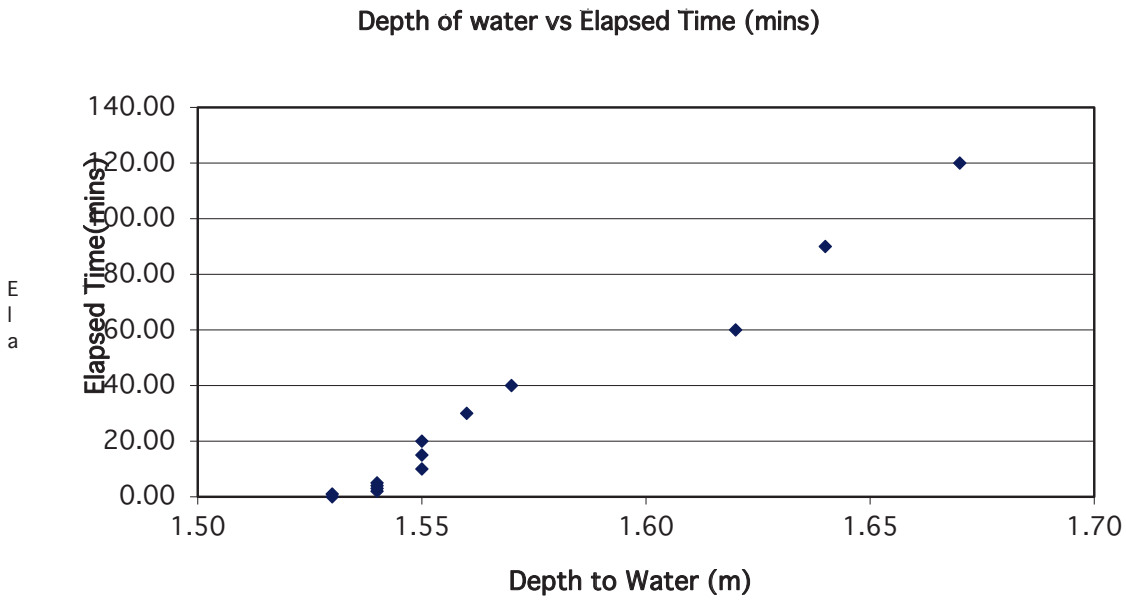
Depth to Water (m)	Elapsed Time (min)
1.53	0.00
1.53	1.00
1.54	2.00
1.54	3.00
1.54	4.00
1.54	5.00
1.55	10.00
1.55	15.00
1.55	20.00
1.56	30.00
1.57	40.00
1.62	60.00
1.64	90.00
1.67	120.00

Field Test

Depth of Pit (D)	2.20	m
Width of Pit (B)	0.80	m
Length of Pit (L)	1.85	m
Initial depth to Water =	1.53	m
Final depth to water =	1.67	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.48	m2
*Av. side area of permeable stratum over test perio	3.18	m2
Total Exposed area =	4.66	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00037 m/min or 6.175E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA19
Client HWBC LTD
Date: 2.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.50	Firm brown slightly sandy slightly gravelly clay.	Dry
0.50	0.80	Weathered rockhead recovered as angular platey cobbles and boulder	
		of grey limestone in a clay matrix. Tough digging refusal at 0.8 m.	

Field Data

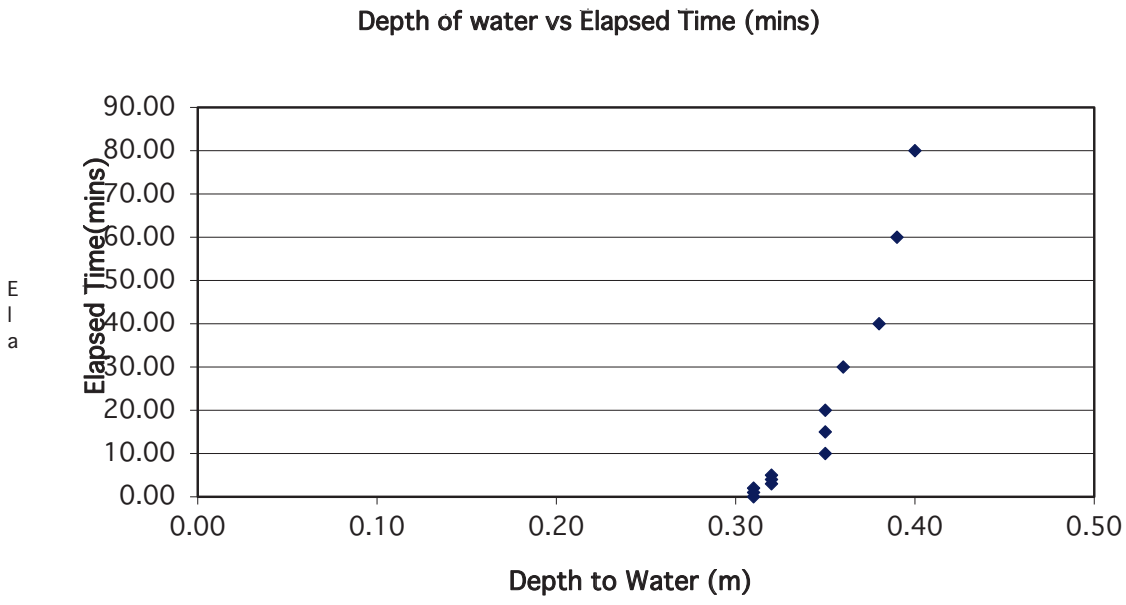
Depth to Water (m)	Elapsed Time (min)
0.31	0.00
0.31	1.00
0.31	2.00
0.32	3.00
0.32	4.00
0.32	5.00
0.35	10.00
0.35	15.00
0.35	20.00
0.36	30.00
0.38	40.00
0.39	60.00
0.40	80.00

Field Test

Depth of Pit (D)	0.80	m
Width of Pit (B)	0.70	m
Length of Pit (L)	2.30	m
Initial depth to Water =	0.31	m
Final depth to water =	0.40	m
Elapsed time (mins)=	80.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.61	m2
*Av. side area of permeable stratum over test perio	2.67	m2
Total Exposed area =	4.28	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00042 m/min or 7.053E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA20
Client HWBC LTD
Date: 2.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.60	Firm brown slightly sandy slightly gravelly clay.	Dry
0.60	1.80	Firm grey slightly sandy very gravelly clay with high cobble content. V	
		weathered blackish grey limestone rockhead within clay from 1 m.	

Field Data

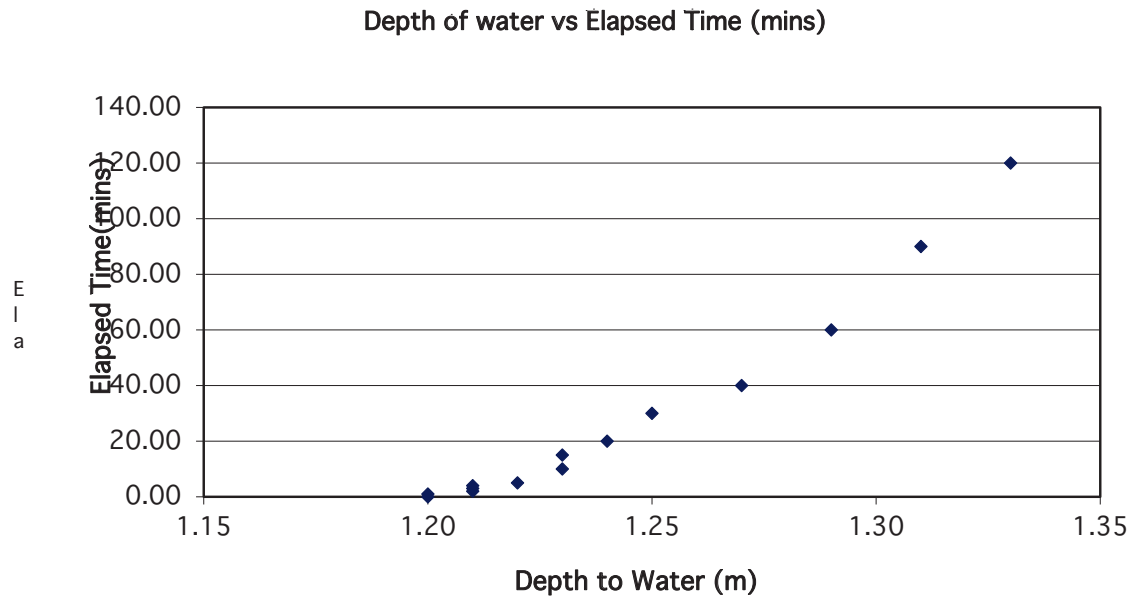
Depth to Water (m)	Elapsed Time (min)
1.20	0.00
1.20	1.00
1.21	2.00
1.21	3.00
1.21	4.00
1.22	5.00
1.23	10.00
1.23	15.00
1.24	20.00
1.25	30.00
1.27	40.00
1.29	60.00
1.31	90.00
1.33	120.00

Field Test

Depth of Pit (D)	1.80	m
Width of Pit (B)	0.70	m
Length of Pit (L)	2.60	m
Initial depth to Water =	1.20	m
Final depth to water =	1.33	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.82	m2
*Av. side area of permeable stratum over test perio	3.531	m2
Total Exposed area =	5.351	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00037 m/min or 6.141E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA21
Client HWBC LTD
Date: 11.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.60	Firm brown slightly sandy gravelly clay with medium cobble content.	Dry
0.60	1.80	Stiff brown slightly sandy very gravelly clay with medium cobble conte	
		and medium boulder content. Refusal on boulders / possible rockhead at 1.8 m.	

Field Data

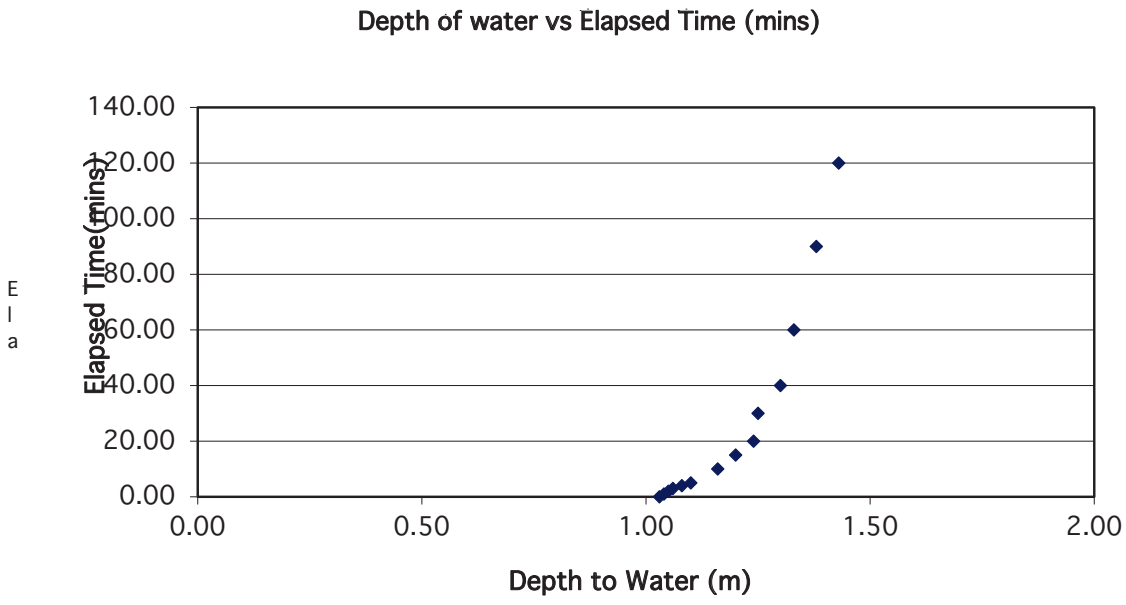
Depth to Water (m)	Elapsed Time (min)
1.03	0.00
1.04	1.00
1.05	2.00
1.06	3.00
1.08	4.00
1.10	5.00
1.16	10.00
1.20	15.00
1.24	20.00
1.25	30.00
1.30	40.00
1.33	60.00
1.38	90.00
1.43	120.00

Field Test

Depth of Pit (D)	1.80	m
Width of Pit (B)	0.45	m
Length of Pit (L)	2.10	m
Initial depth to Water =	1.03	m
Final depth to water =	1.43	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.945	m2
*Av. side area of permeable stratum over test perio	2.907	m2
Total Exposed area =	3.852	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00082 m/min or 1.363E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyoulster Contract No. 23679
Test No. SA22
Client HWBC LTD
Date: 03.11.21

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.50	Firm brown slightly sandy gravelly clay.	Dry
0.50	1.10	Firm brown grey slightly sandy gravelly clay with occasional cobbles.	
1.10	1.40	Firm grey slightly sandy gravelly clay with low cobble content. Refusal at 1.4M.	

Notes:

Field Data

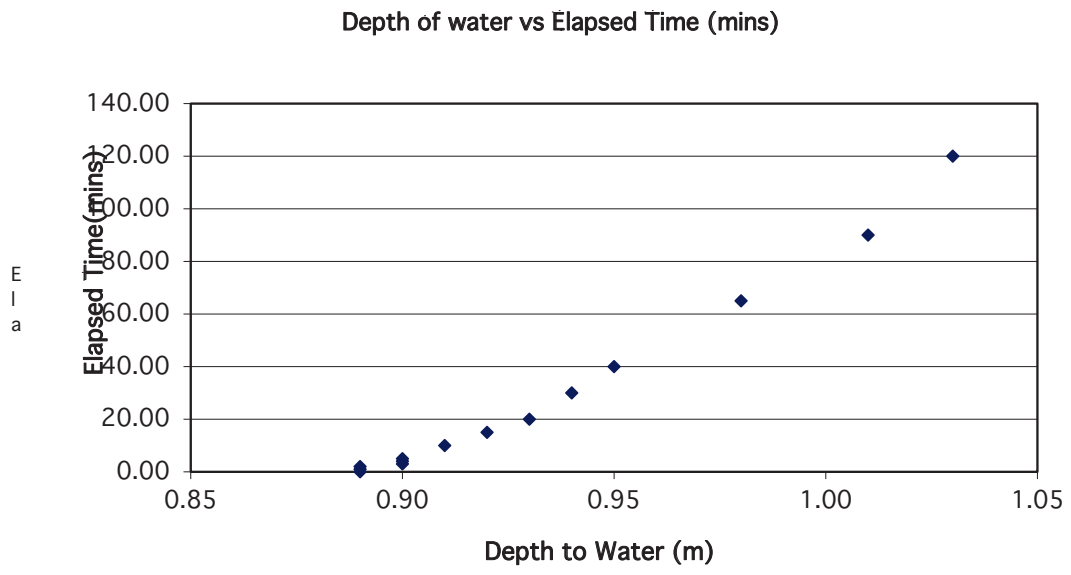
Depth to Water (m)	Elapsed Time (min)
0.89	0.00
0.89	1.00
0.89	2.00
0.90	3.00
0.90	4.00
0.90	5.00
0.91	10.00
0.92	15.00
0.93	20.00
0.94	30.00
0.95	40.00
0.98	65.00
1.01	90.00
1.03	120.00

Field Test

Depth of Pit (D)	1.40	m
Width of Pit (B)	0.60	m
Length of Pit (L)	2.20	m
Initial depth to Water =	0.89	m
Final depth to water =	1.03	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.32	m2
*Av. side area of permeable stratum over test perio	2.464	m2
Total Exposed area =	3.784	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00041 m/min or 6.783E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA23
Client HWBC LTD
Date: 11.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	Dry
0.25	0.60	Firm to stiff brown slightly sandy clay.	
0.60	1.20	Firm to stiff greyish brown slightly sandy very gravelly caly with high cobble content. Refusal at 1.2m on rockhead recovered as angular platey limestone.	

Field Data

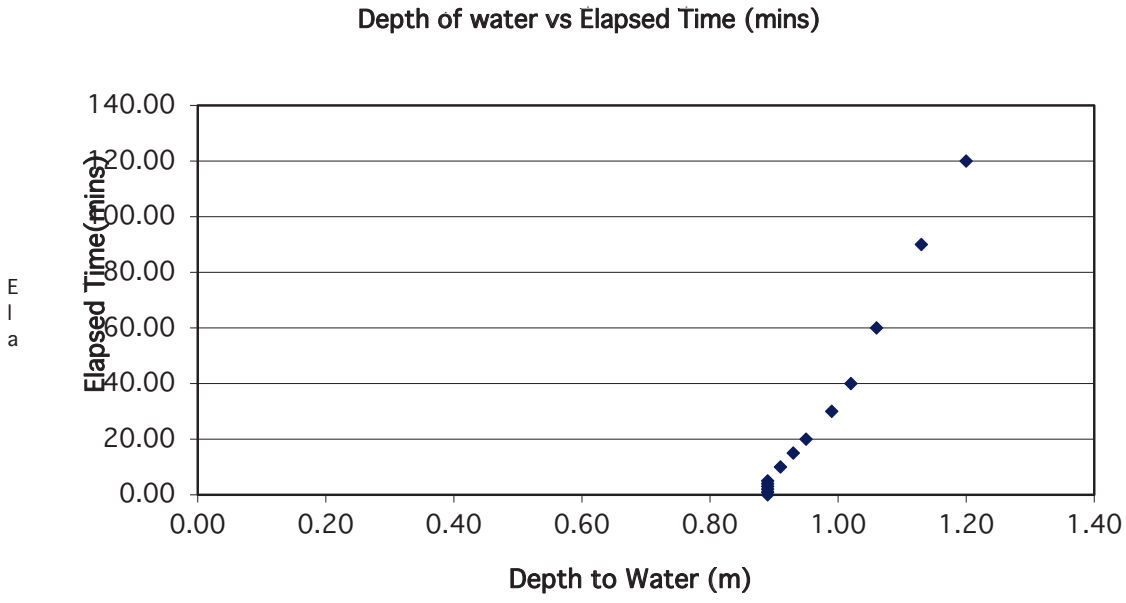
Depth to Water (m)	Elapsed Time (min)
0.89	0.00
0.89	1.00
0.89	2.00
0.89	3.00
0.89	4.00
0.89	5.00
0.91	10.00
0.93	15.00
0.95	20.00
0.99	30.00
1.02	40.00
1.06	60.00
1.13	90.00
1.20	120.00

Field Test

Depth of Pit (D)	1.20	m
Width of Pit (B)	0.45	m
Length of Pit (L)	1.90	m
Initial depth to Water =	0.89	m
Final depth to water =	1.20	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.855	m2
*Av. side area of permeable stratum over test perio	0.7285	m2
Total Exposed area =	1.5835	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00139 m/min or 2.325E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ballyouster Contract No. 23679
Test No. SA24
Client HWBC LTD
Date: 2.11.2021

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	0.60	Firm brown slightly sandy gravelly clay.	Dry
0.60	0.80	Weathered rockhead recovered as angular platey cobbles and boulder	
		of blackish grey limestone. Refusal at 0.8 m.	

Field Data

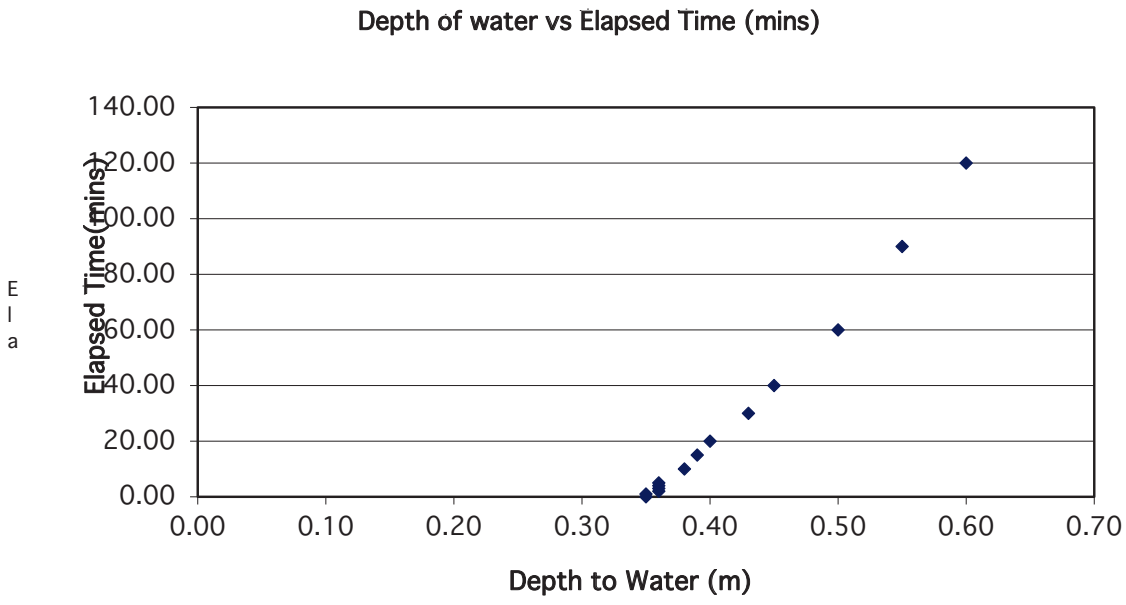
Depth to Water (m)	Elapsed Time (min)
0.35	0.00
0.35	1.00
0.36	2.00
0.36	3.00
0.36	4.00
0.36	5.00
0.38	10.00
0.39	15.00
0.40	20.00
0.43	30.00
0.45	40.00
0.50	60.00
0.55	90.00
0.60	120.00

Field Test

Depth of Pit (D)	0.80	m
Width of Pit (B)	0.90	m
Length of Pit (L)	2.50	m
Initial depth to Water =	0.35	m
Final depth to water =	0.60	m
Elapsed time (mins)=	120.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.25	m2
*Av. side area of permeable stratum over test perio	2.21	m2
Total Exposed area =	4.46	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00105 m/min or 1.752E-05 m/sec



Appendix 6 Gas and Groundwater Results

Gas & Groundwater Monitoring

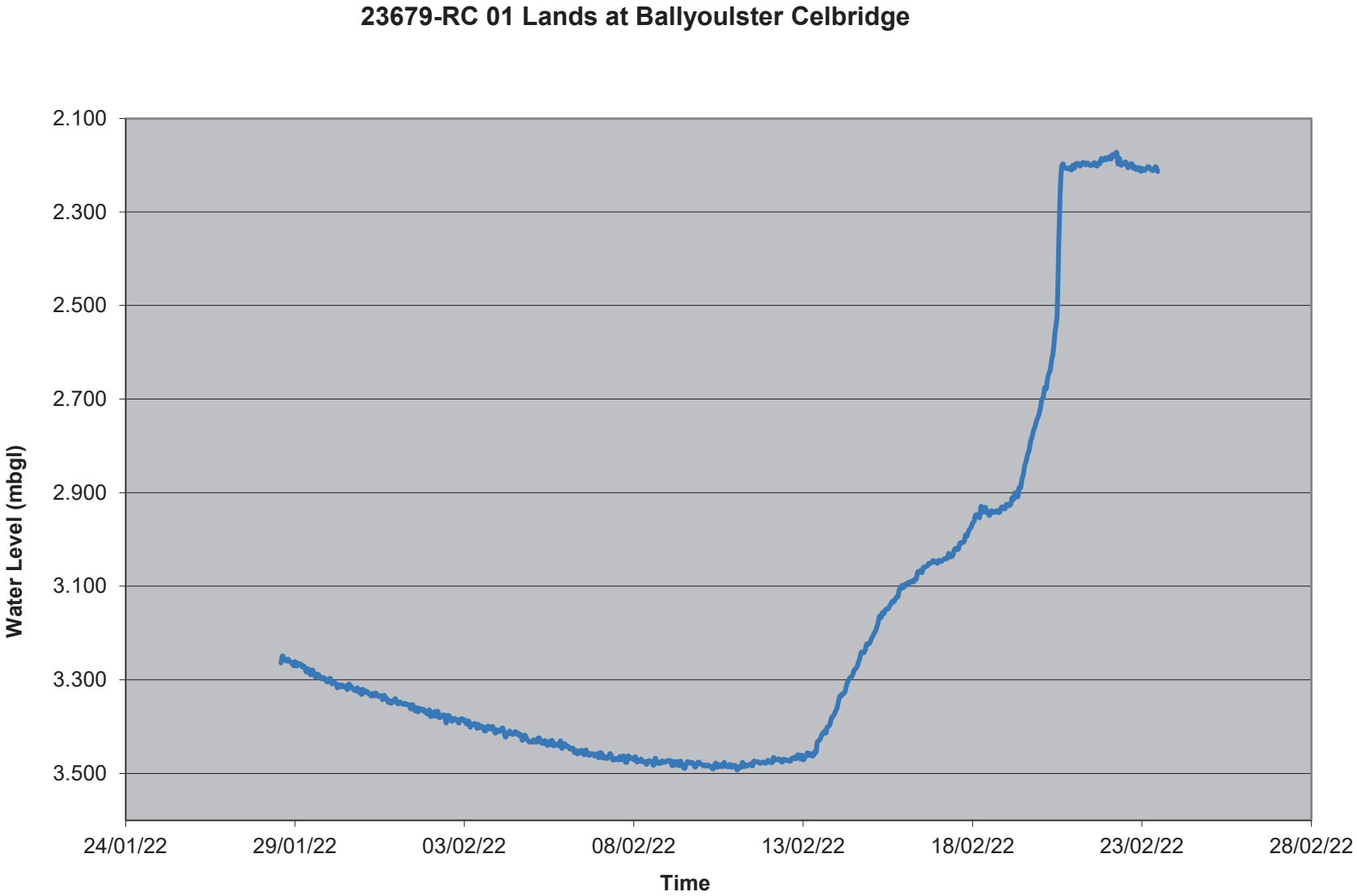
Site Location	Ballyoulster Celbridge
Project No.	23679
Client	HWBC Ltd
Date	01-Dec-21

	RC05	RC07	RC08	RC01	RC02	RC03	RC04	RC06	
WATER LEVEL (m bgl)	2.43	1.98	4.27	3.51	2.65	2.32	2.77	2.29	
GAS FLOW	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	
CH4(%)	0.0	0.0	0.0	0.0	0	0	0	0	
CO2(%)	0.2	0.2	0.3	2.1	1.8	1.9	1.7	0.3	
O2(%)	21.3	21.7	21.0	20.3	19.3	20.3	21.8	22.2	
H2S									
CO									
BAROMETRIC PRESURE (mb)	998	998	998	998	998	998	998	998	
WEATHER									
COMMENTS									

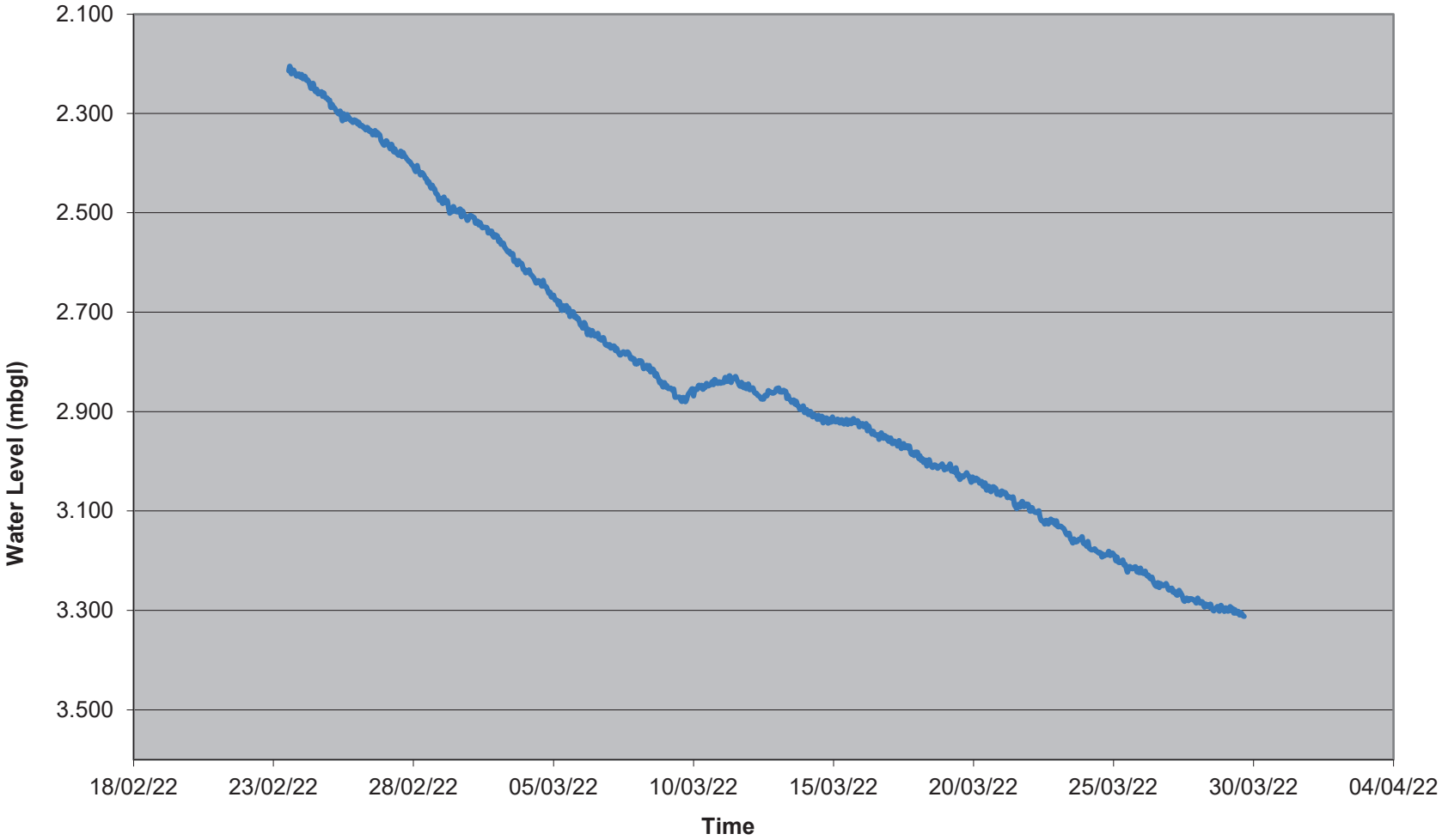
Gas & Groundwater Monitoring

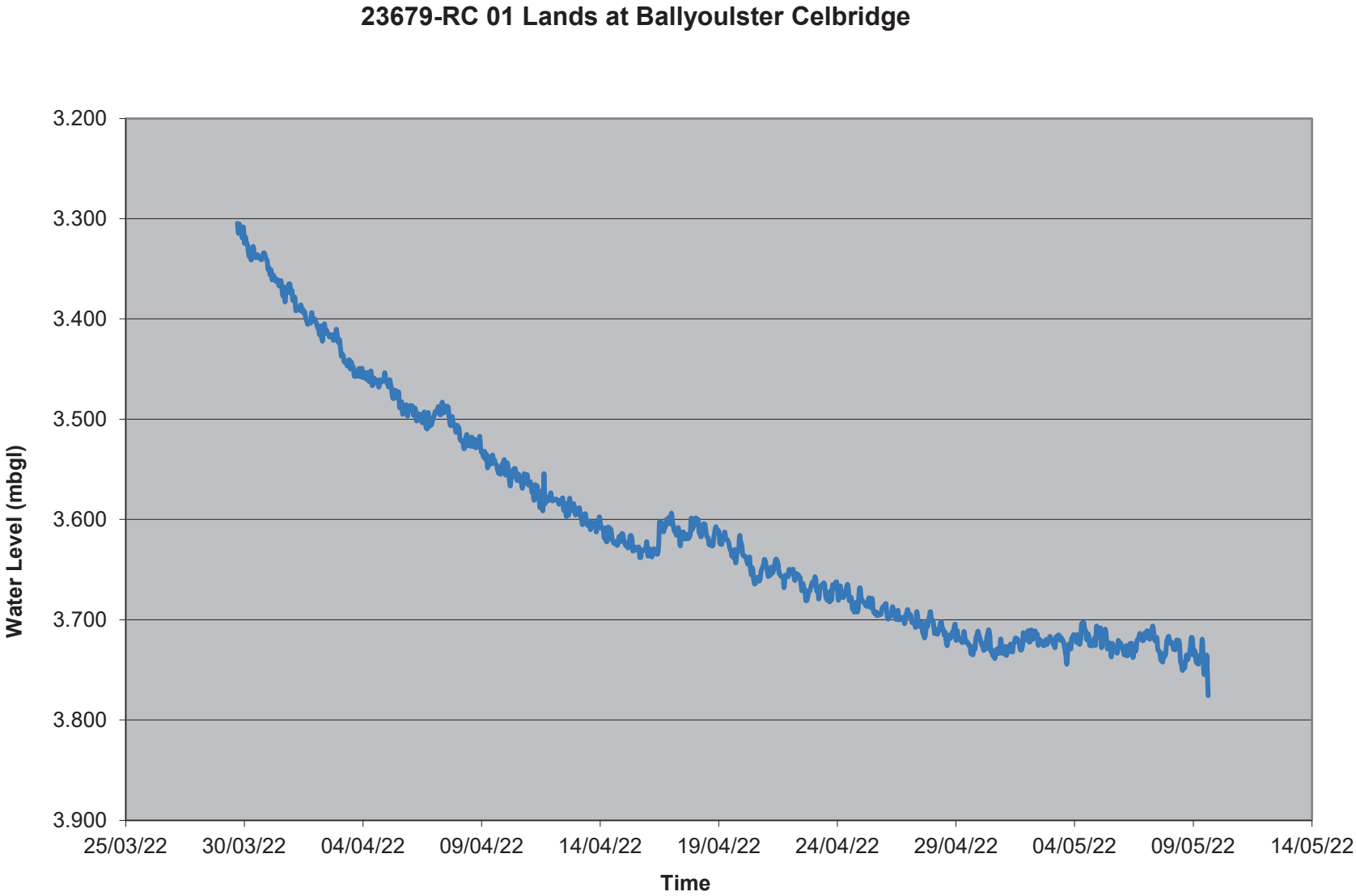
Site Location	**Ballyoulster Celbridge**
Project No.	**23679**
Client	**HWBC Ltd**
Date	**13-Jan-22**

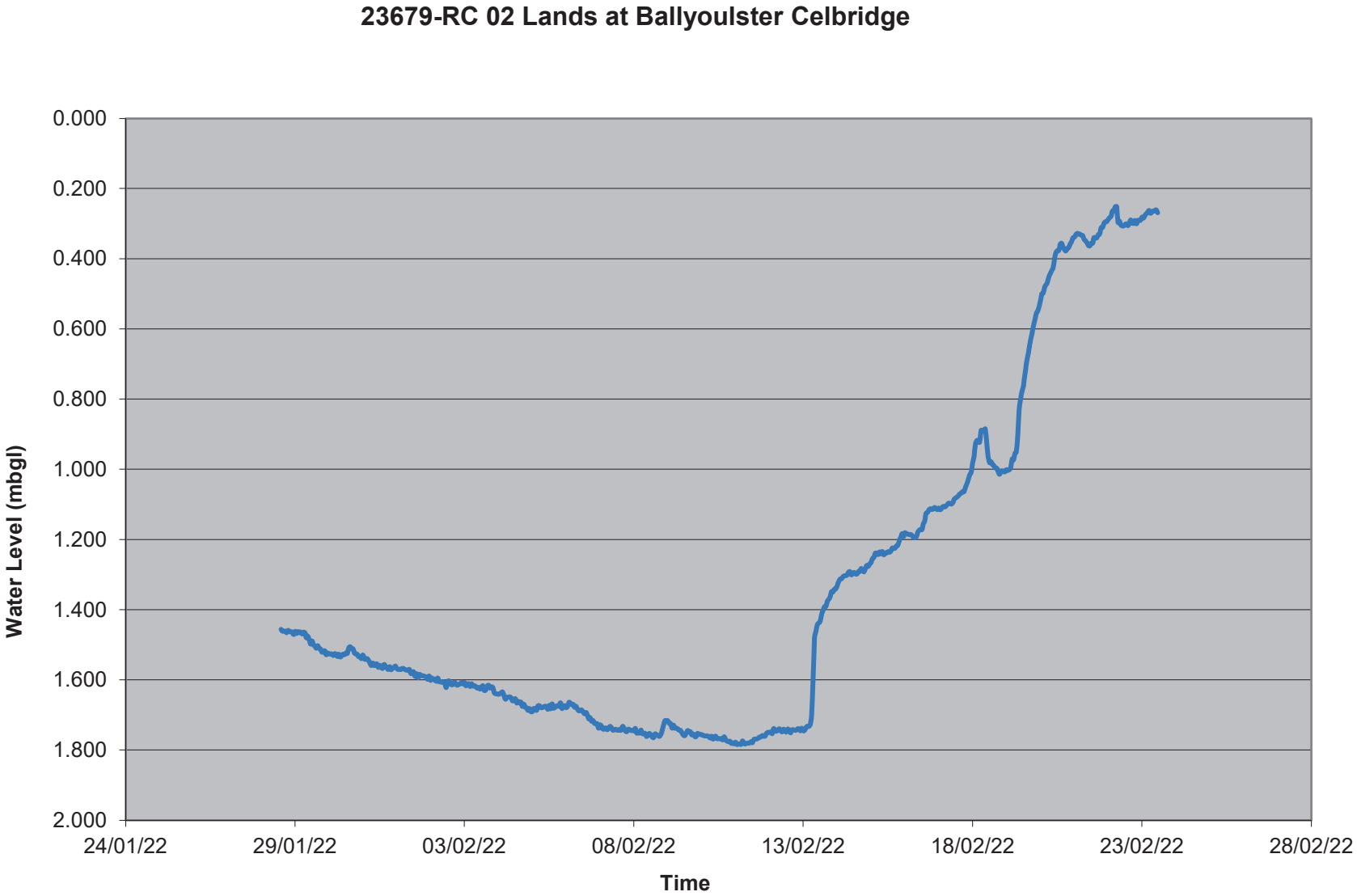
	RC05	RC07	RC08	RC01	RC02	RC03	RC04	RC06
WATER LEVEL (m bgl)	2.02	1.88	3.95	2.67	0.54	1.53	2.6	1.4
GAS FLOW	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1
CH4(%)	0.0	0.0	0.0	0.0	0	0	0	0
CO2(%)	0.1	0.0	0.2	1.5	0.1	1.8	2.1	0.1
O2(%)	20.2	20.5	20.1	16.8	19.1	14.5	14.2	22.2
H2S	0.0	0.0	0.0	0.0	0	0	0	0
CO	0.0	0.0	0.0	0.0	0	0	0	0
BAROMETRIC PRESURE (mb)	1034	1034	1034	1034	1034	1034	1034	1034
WEATHER	Dry, Overcast							
COMMENTS								

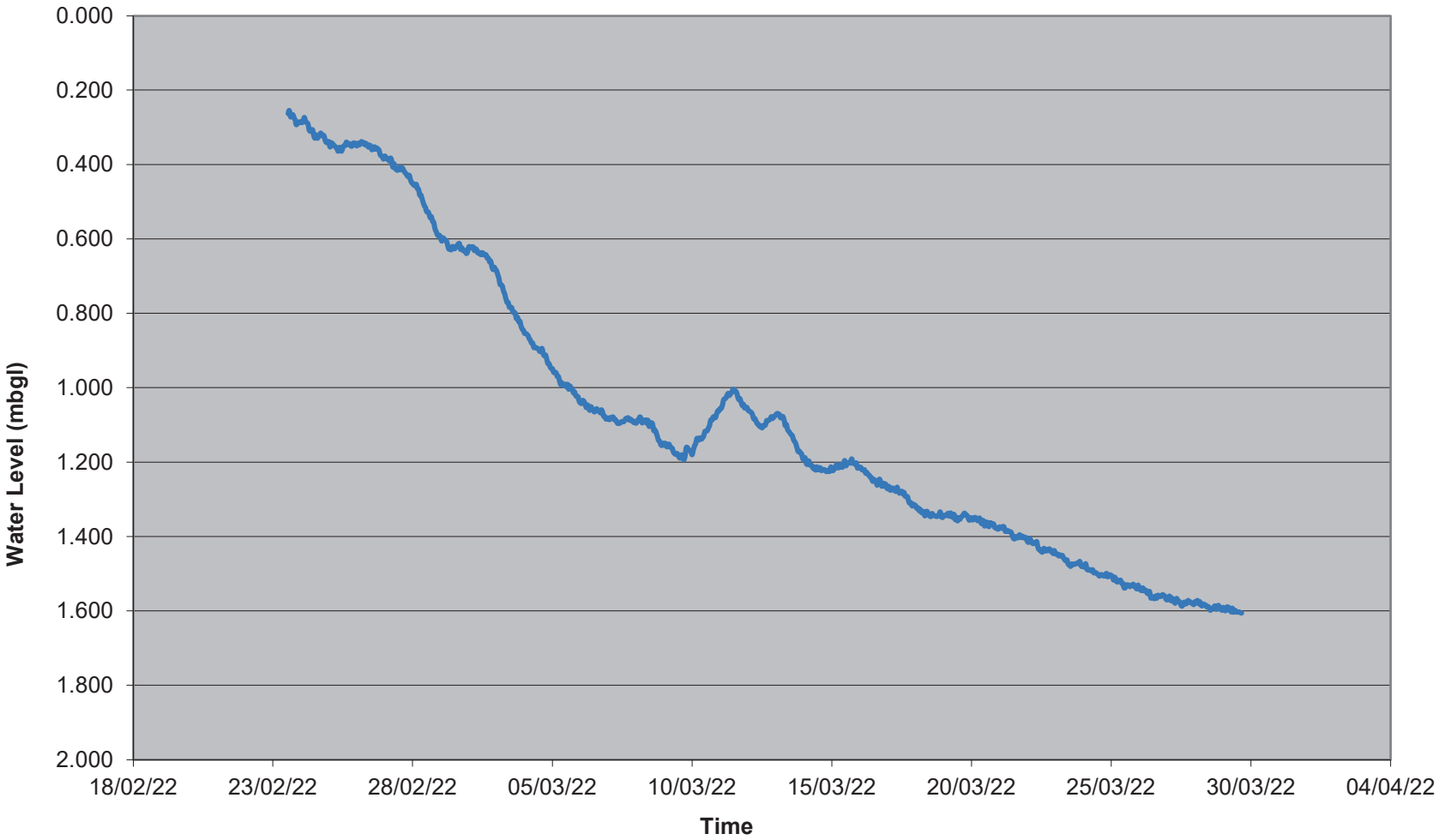

23679-RC 01 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.100
2.300
2.500
2.700
2.900
3.100
3.300
3.500
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

23679-RC 01 Lands at Ballyoulster Celbridge

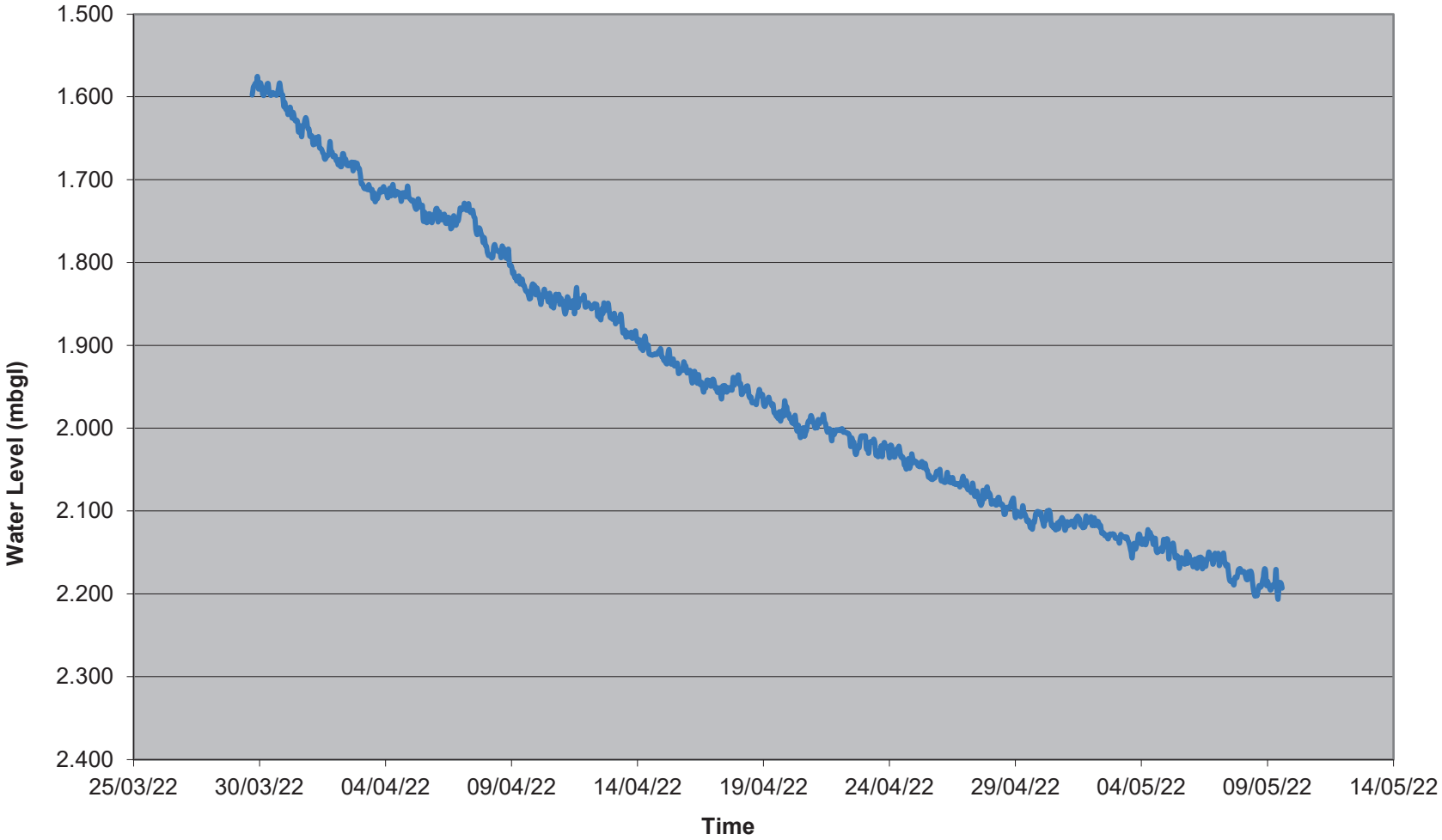


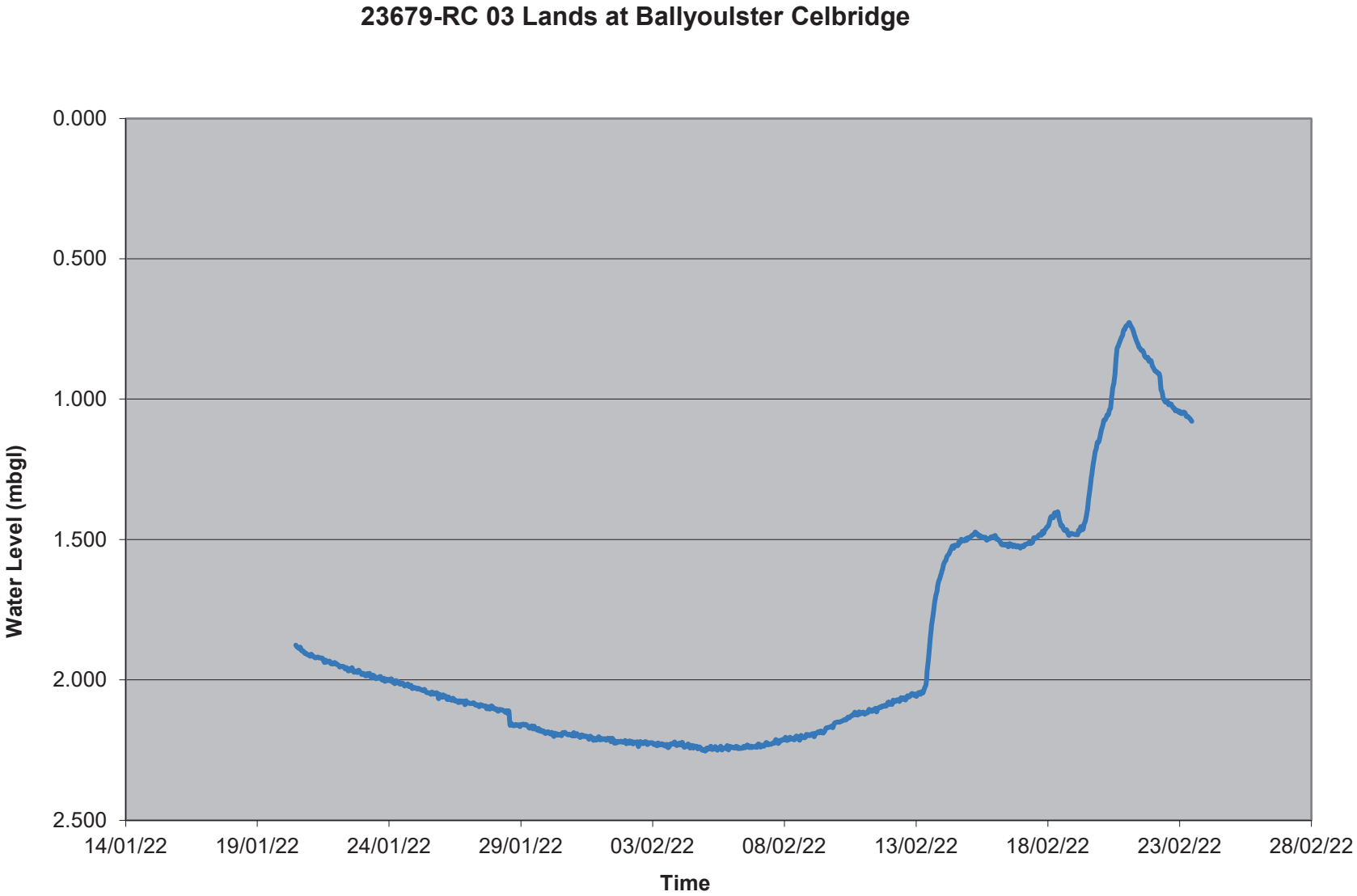

23679-RC 01 Lands at Ballyoulster Celbridge
Water Level (mbgl)
3.200
3.300
3.400
3.500
3.600
3.700
3.800
3.900
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time


23679-RC 02 Lands at Ballyoulster Celbridge
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
Water Level (mbgl)
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

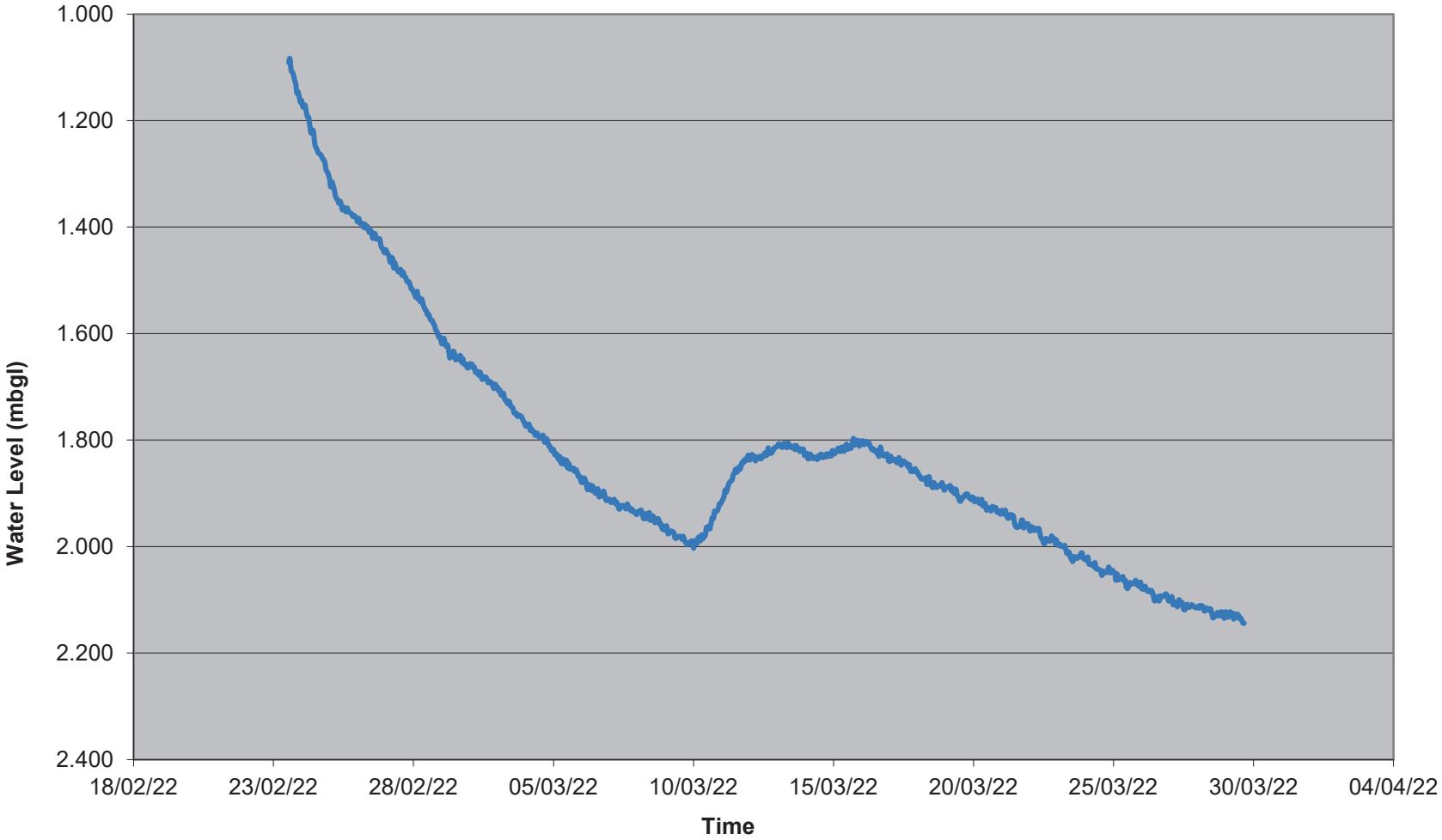

23679-RC 02 Lands at Ballyoulster Celbridge
Water Level (mbgl)
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
18/02/22
23/02/22
28/02/22
05/03/22
10/03/22
15/03/22
20/03/22
25/03/22
30/03/22
04/04/22
Time

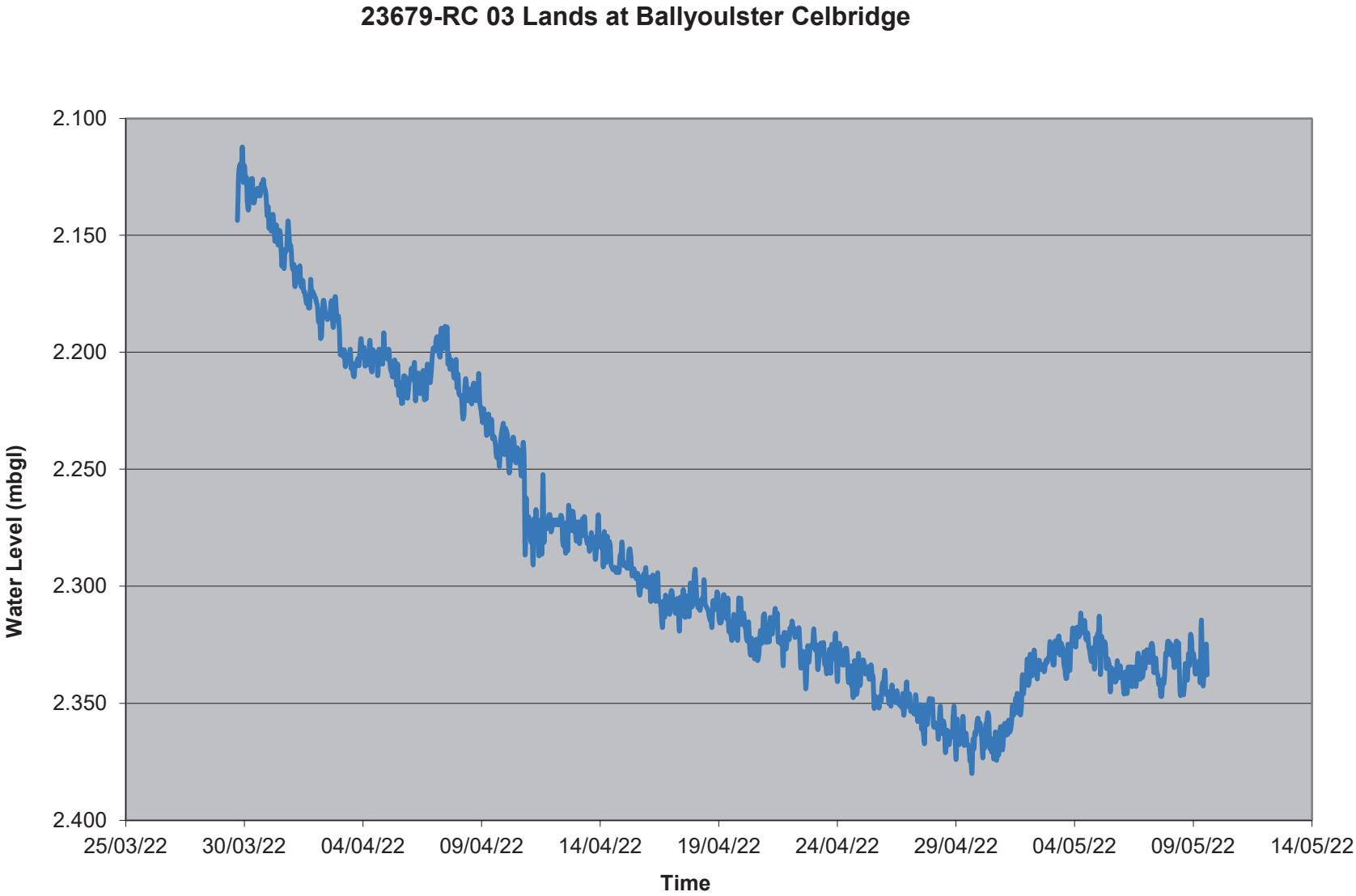
23679-RC 02 Lands at Ballyoulster Celbridge



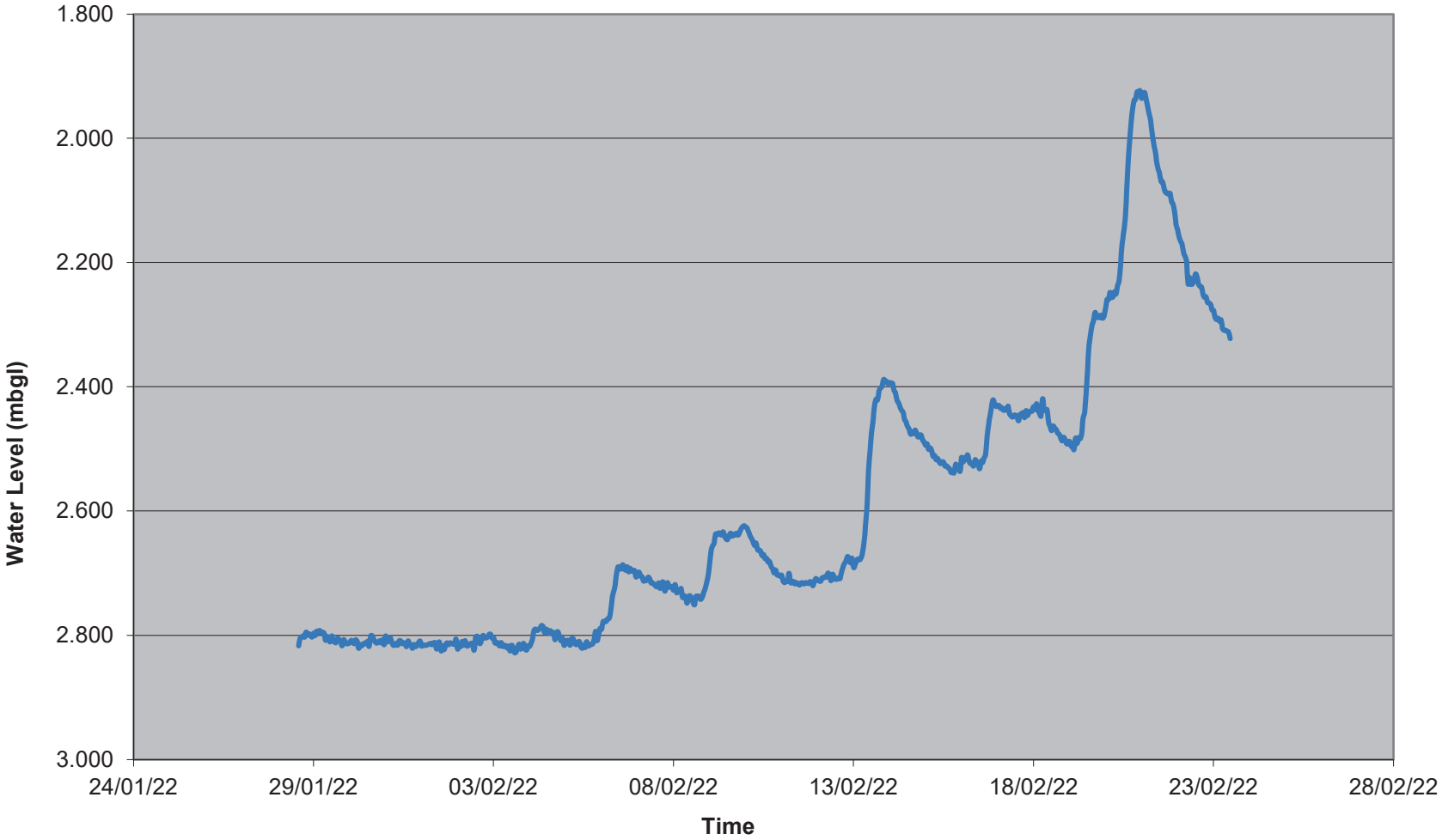

23679-RC 03 Lands at Ballyoulster Celbridge
0.000
0.500
1.000
1.500
2.000
2.500
Water Level (mbgl)
14/01/22
19/01/22
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

23679-RC 03 Lands at Ballyoulster Celbridge

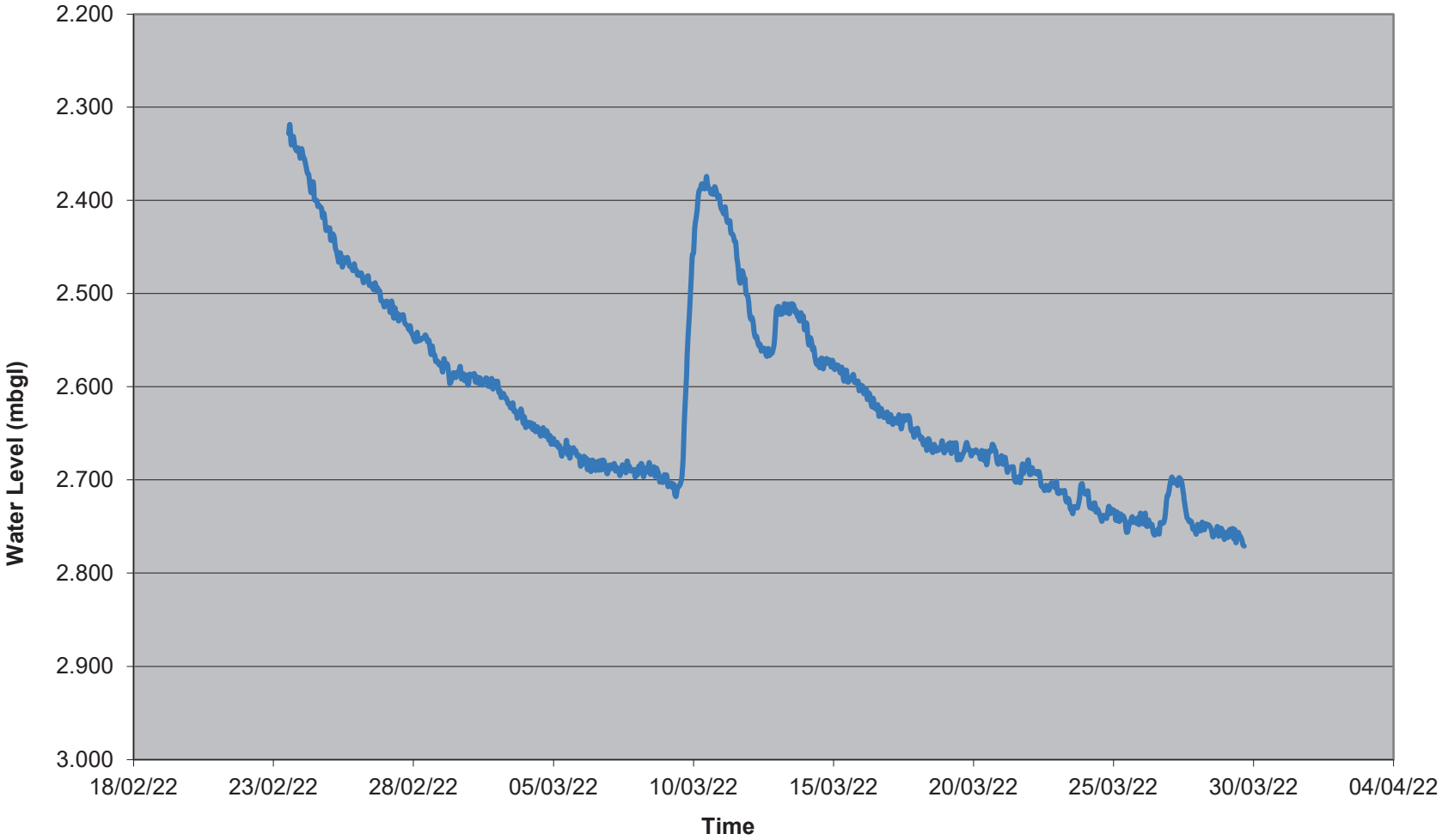


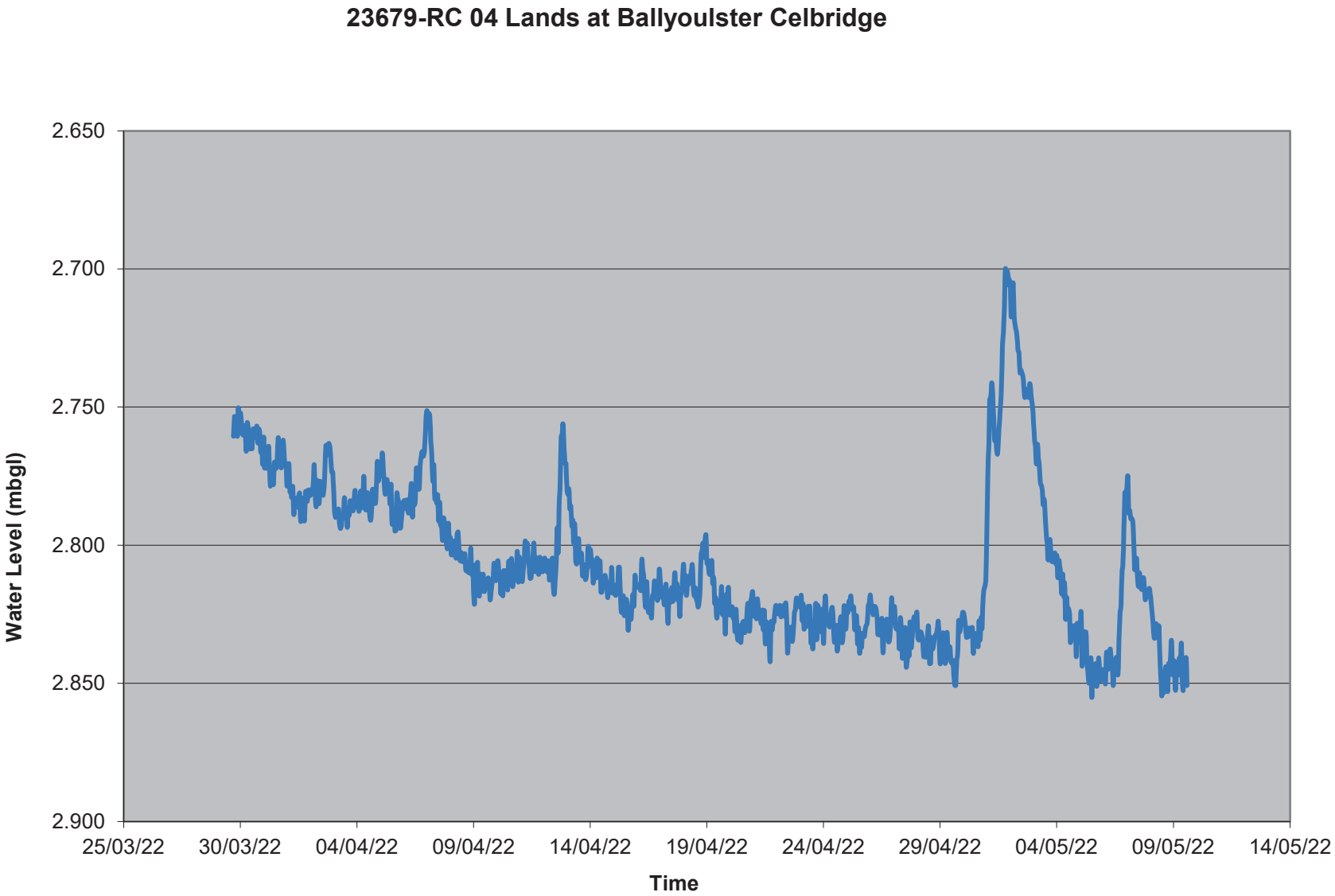

23679-RC 03 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.100
2.150
2.200
2.250
2.300
2.350
2.400
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time

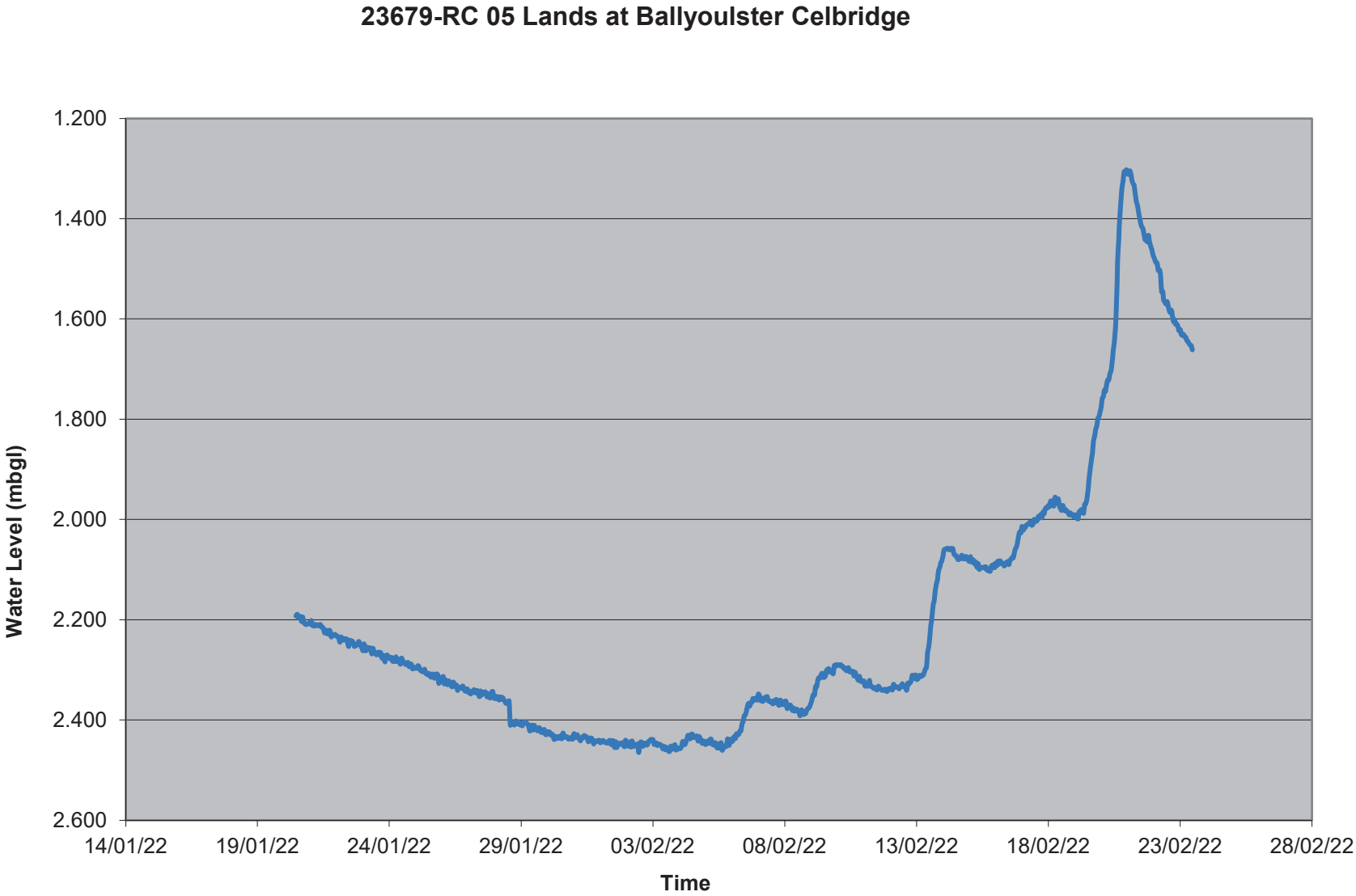
23679-RC 04 Lands at Ballyoulster Celbridge



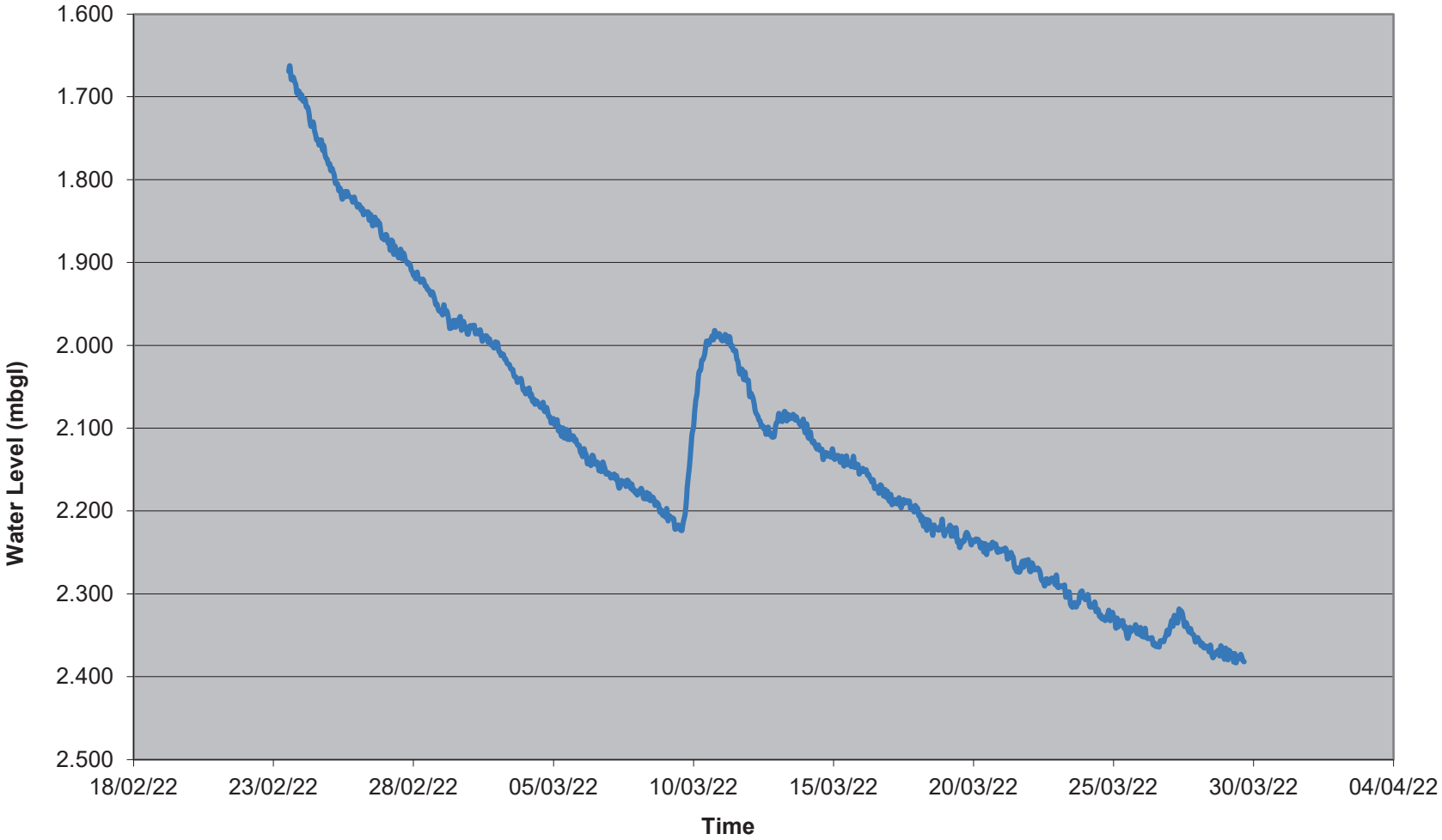
23679-RC 04 Lands at Ballyoulster Celbridge

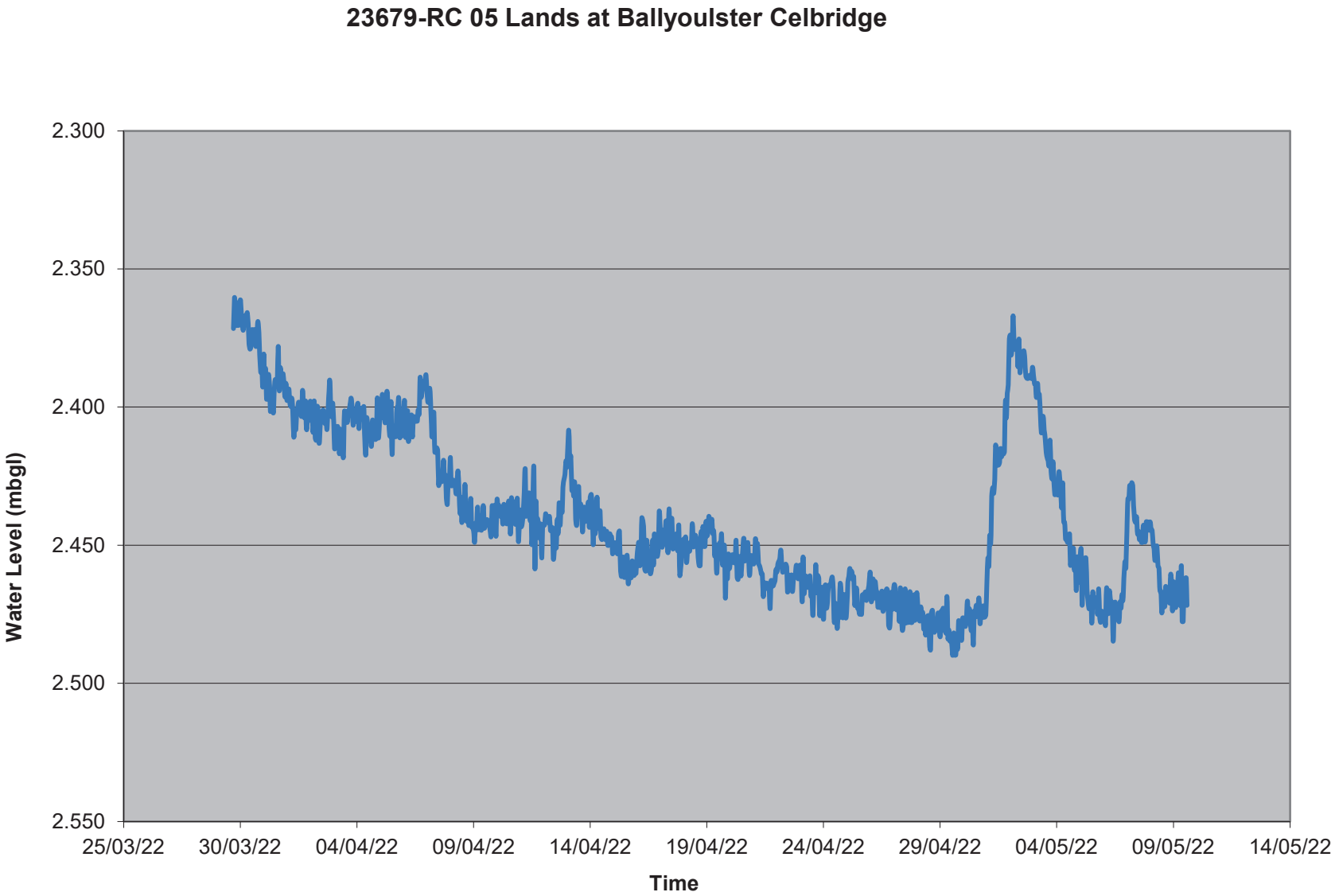


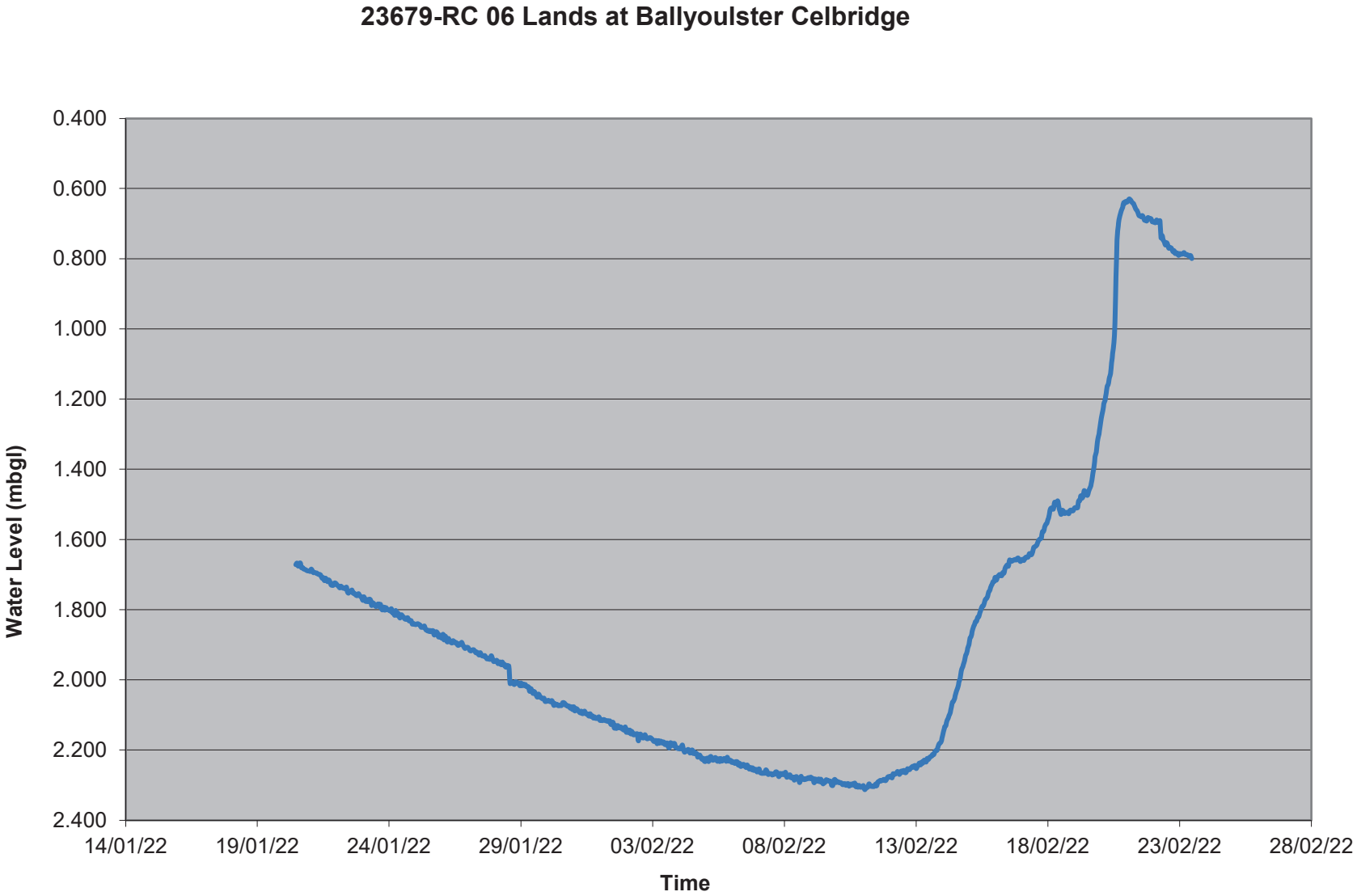

23679-RC 04 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.650
2.700
2.750
2.800
2.850
2.900
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time


23679-RC 05 Lands at Ballyoulster Celbridge
Water Level (mbgl)
1.200
1.400
1.600
1.800
2.000
2.200
2.400
2.600
14/01/22
19/01/22
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

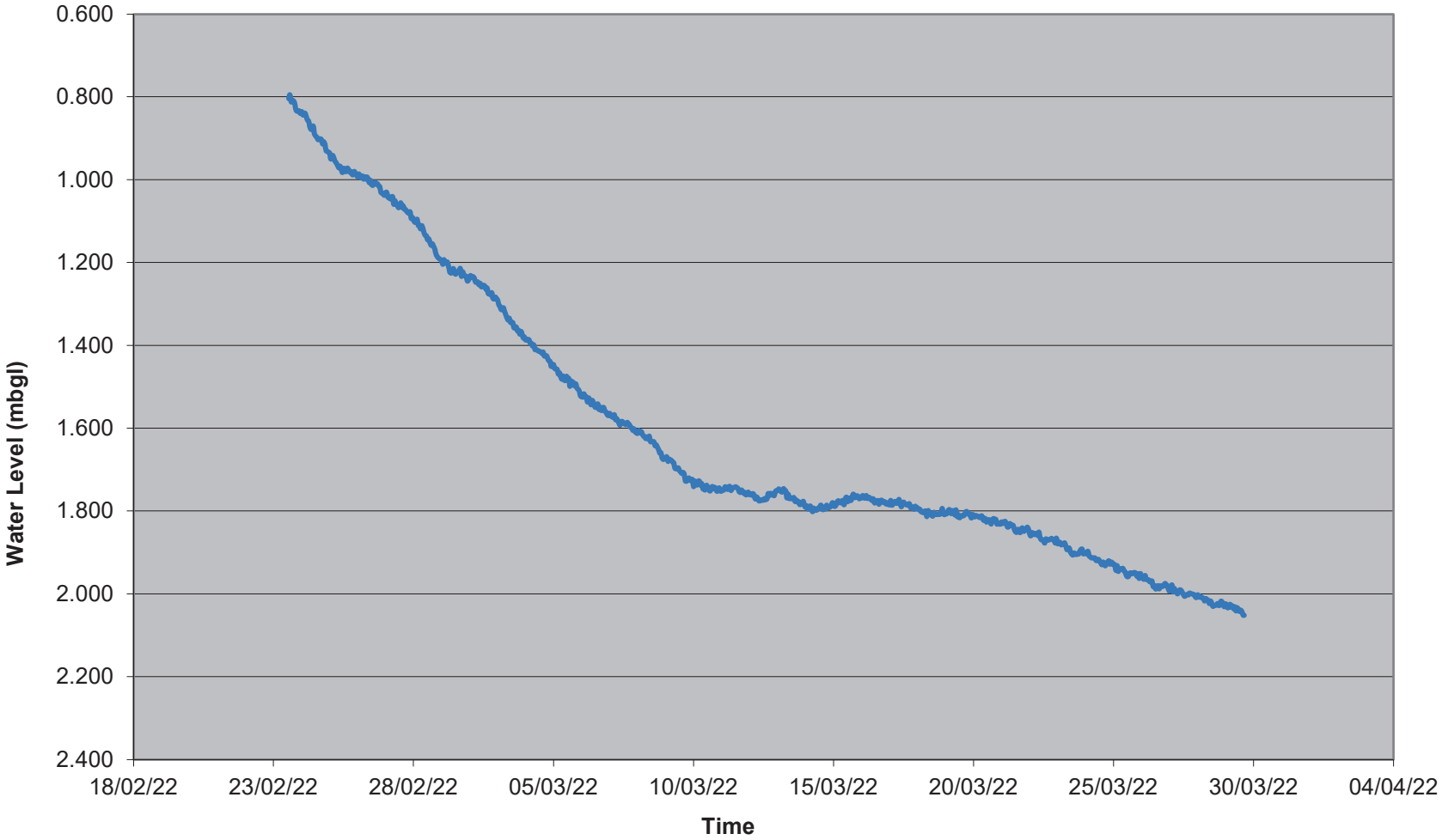
23679-RC 05 Lands at Ballyoulster Celbridge

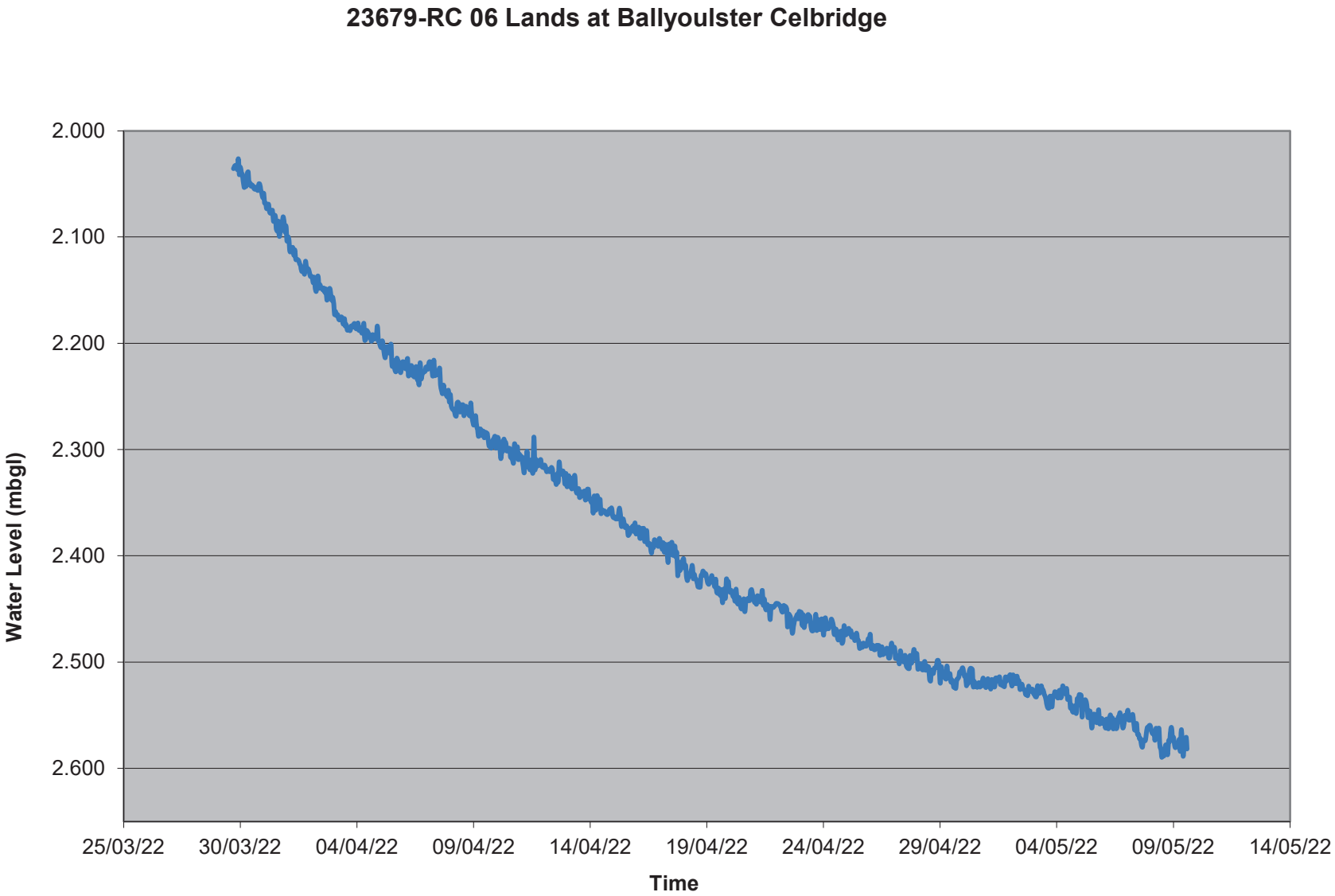


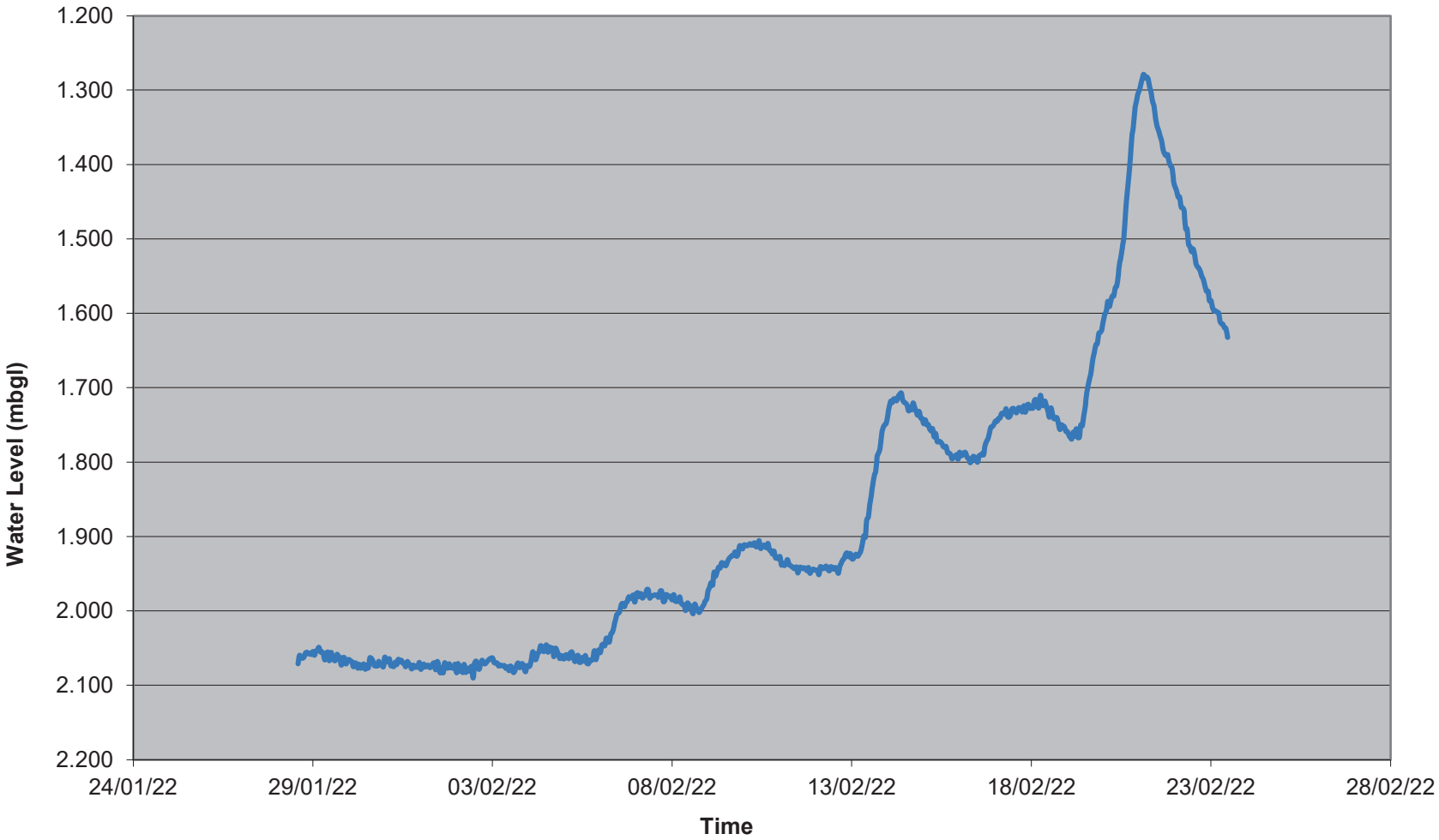

23679-RC 05 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.300
2.350
2.400
2.450
2.500
2.550
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time

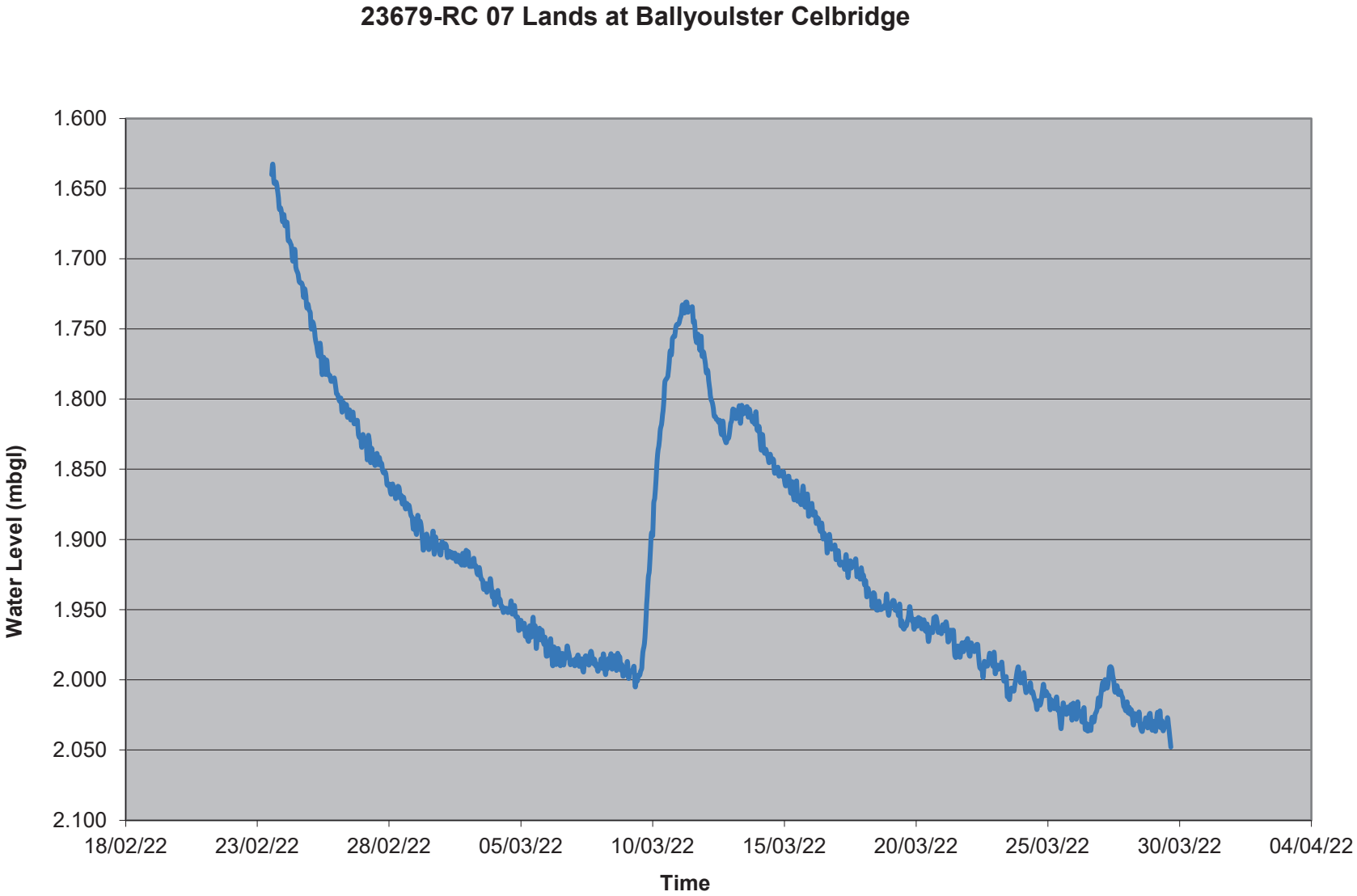

23679-RC 06 Lands at Ballyoulster Celbridge
Water Level (mbgl)
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
14/01/22
19/01/22
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

23679-RC 06 Lands at Ballyoulster Celbridge

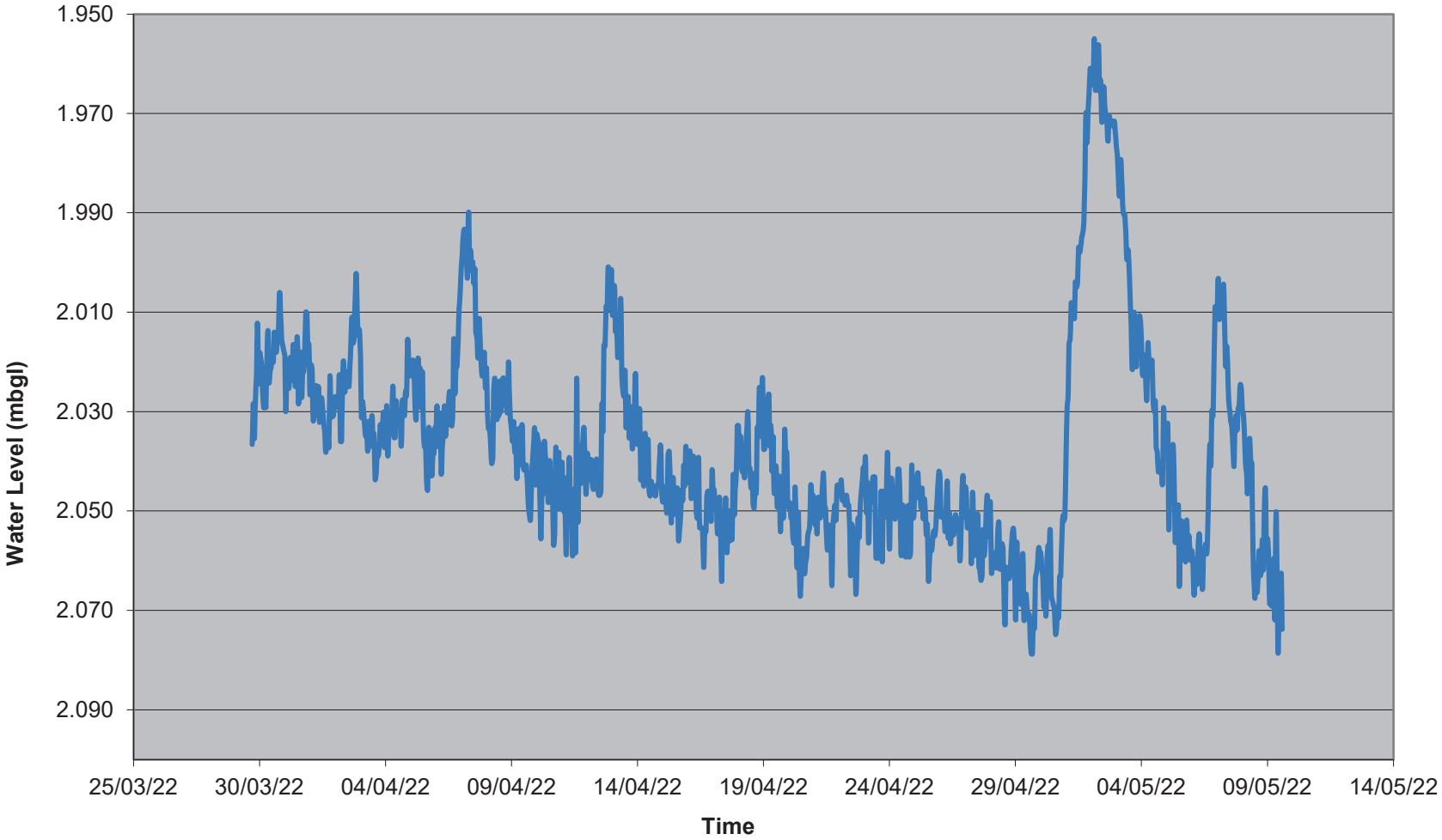


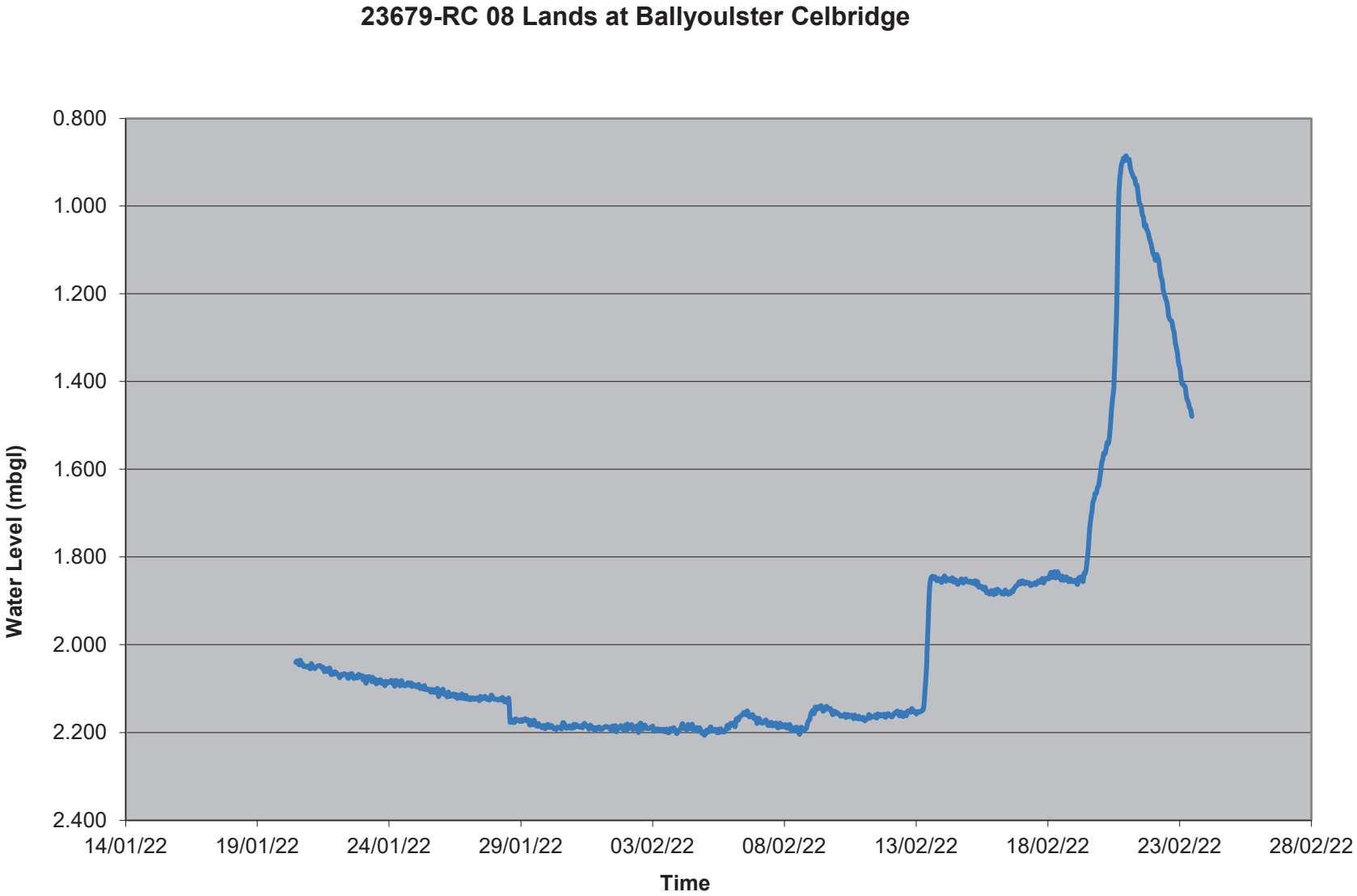

23679-RC 06 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.000
2.100
2.200
2.300
2.400
2.500
2.600
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time


23679-RC 07 Lands at Ballyoulster Celbridge
Water Level (mbgl)
1.200
1.300
1.400
1.500
1.600
1.700
1.800
1.900
2.000
2.100
2.200
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

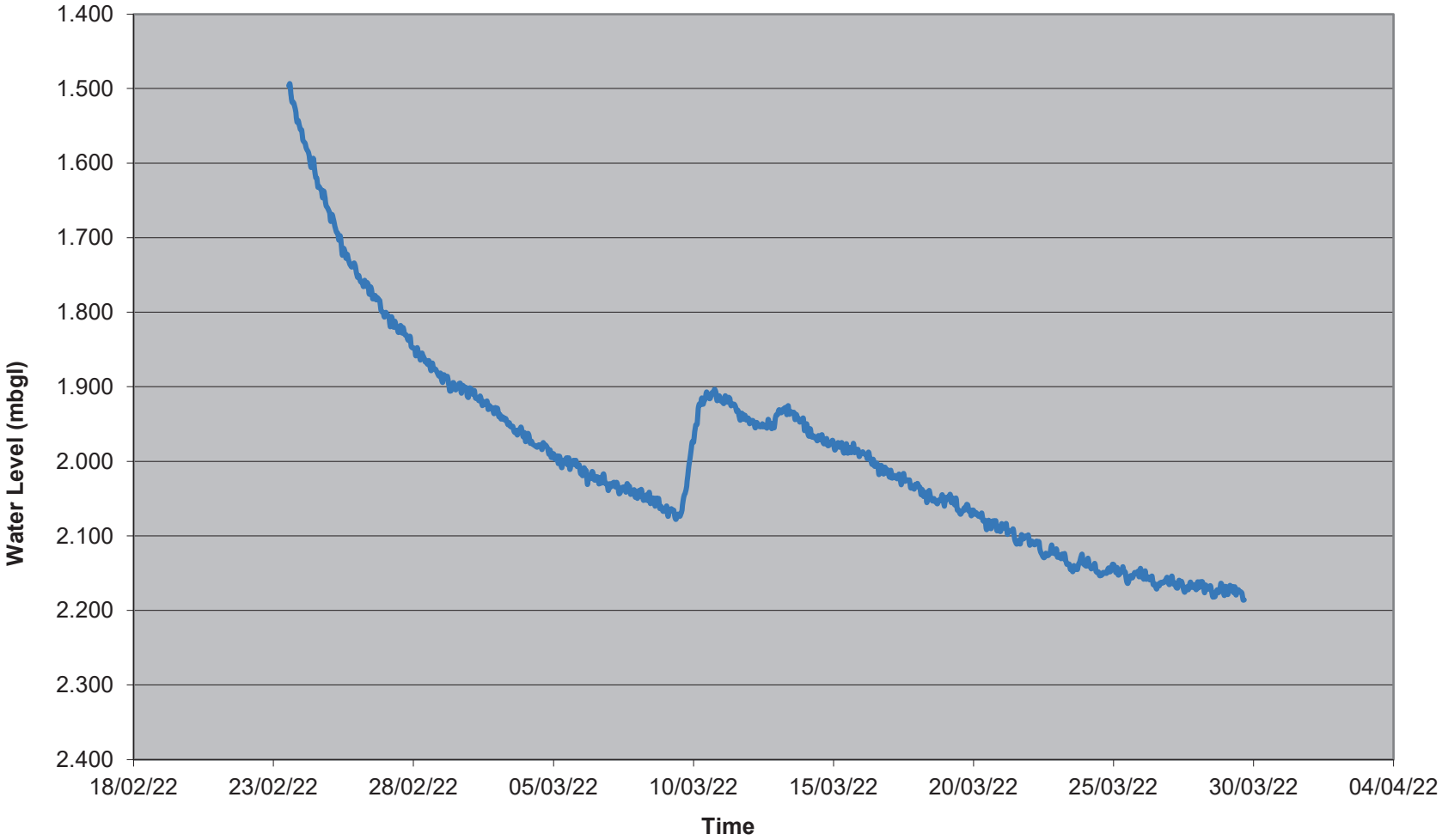

23679-RC 07 Lands at Ballyoulster Celbridge
Water Level (mbgl)
1.600
1.650
1.700
1.750
1.800
1.850
1.900
1.950
2.000
2.050
2.100
18/02/22
23/02/22
28/02/22
05/03/22
10/03/22
15/03/22
20/03/22
25/03/22
30/03/22
04/04/22
Time

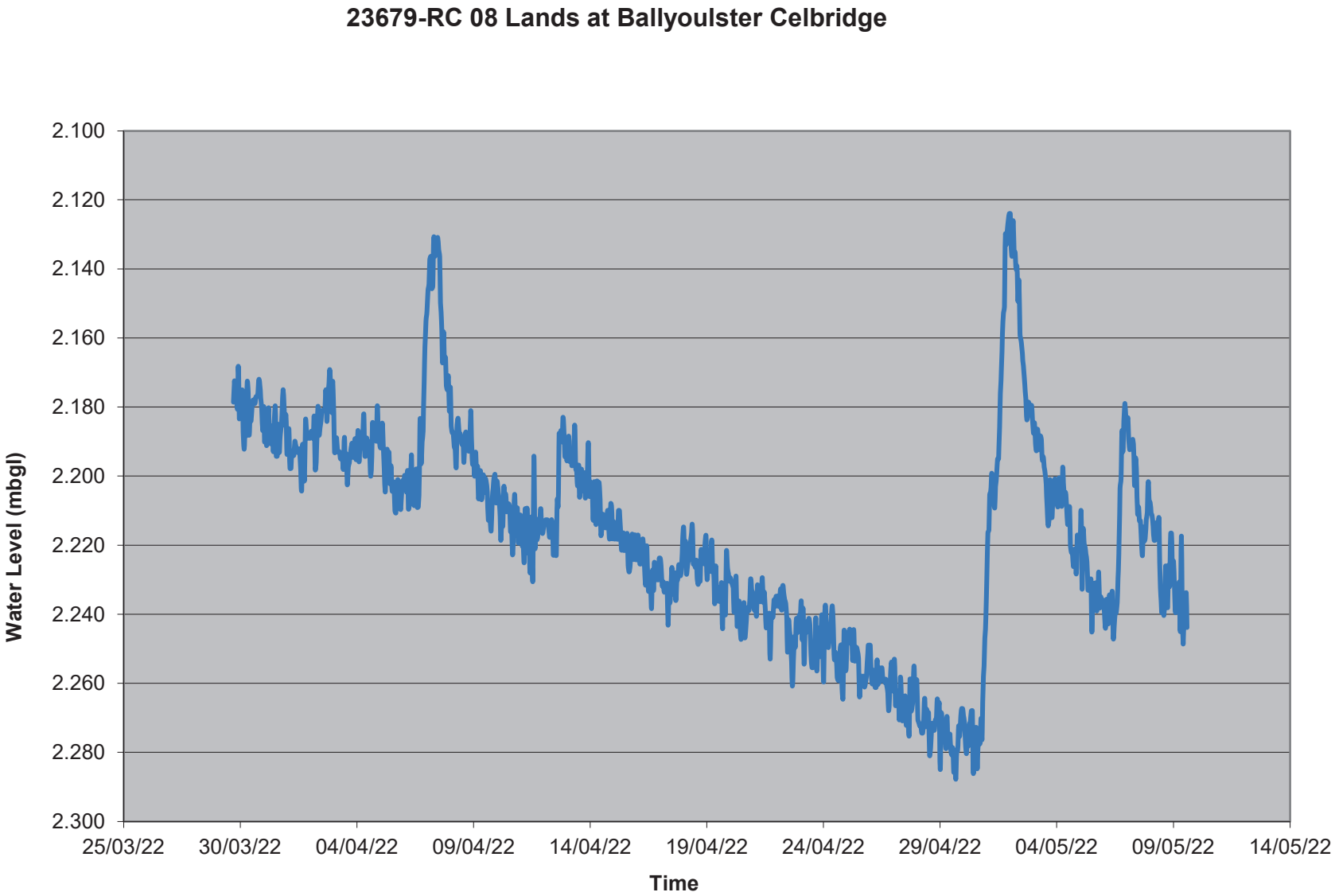
23679-RC 07 Lands at Ballyoulster Celbridge




23679-RC 08 Lands at Ballyoulster Celbridge
Water Level (mbgl)
0.800
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
14/01/22
19/01/22
24/01/22
29/01/22
03/02/22
08/02/22
13/02/22
18/02/22
23/02/22
28/02/22
Time

23679-RC 08 Lands at Ballyoulster Celbridge




23679-RC 08 Lands at Ballyoulster Celbridge
Water Level (mbgl)
2.100
2.120
2.140
2.160
2.180
2.200
2.220
2.240
2.260
2.280
2.300
25/03/22
30/03/22
04/04/22
09/04/22
14/04/22
19/04/22
24/04/22
29/04/22
04/05/22
09/05/22
14/05/22
Time

Appendix 7 Laboratory Test Results (Geotechnical)

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
Co. Kildare
045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2, 4.3, 4.4 & 5.3**

Report No. **R130390** Contract No. 23679 Contract Name: Ballyouster Celbridge Kildare

Customer DBFL

Samples Received: 21/12/21 Date Tested: 21/12/21

BH/TP*	Sample No.	Depth* (m)	Lab. Ref	Sample Type*	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
TP01	AA150904	1.0	A21/6526	B	23	38	20	18	78	WS	4.4	C I	Brown sandy, gravelly, CLAY
TP03	AA150906	0.9	A21/6527	B	33	57	30	27	74	WS	4.4	M H	Brown slightly sandy, slightly gravelly, SILT
TP05	AA150912	0.9	A21/6528	B	20	34	18	16	61	WS	4.4	C L	Brown sandy, gravelly, CLAY
TP08	AA18360	1.5	A21/6529	B	15	26	14	12	74	WS	4.4	C L	Brown slightly sandy, slightly gravelly, CLAY
TP12	AA18366	1.4	A21/6531	B	16	24	15	9	80	WS	4.4	C L	Brown sandy, gravelly, CLAY
TP14	AA150916	0.8	A21/6532	B	20	35	16	19	71	WS	4.4	C L	Brown sandy, gravelly, CLAY
TP17	AA156974	1.1	A21/6534	B	18	42	25	17	70	WS	4.4	C I	Brown slightly sandy, slightly gravelly, CLAY
TP23	AA156962	1.5	A21/6536	B	39	63	35	28	95	WS	4.4	M H	Brown slightly sandy, slightly gravelly, SILT
TP23	AA156963	2.8	A21/6537	B	37	49	30	19	70	WS	4.4	M I	Brown sandy, gravelly, SILT
TP24	AA160295	1.5	A21/6535	B	20	30	17	13	66	WS	4.4	C L	Brown sandy, gravelly, CLAY

Preparation: WS - Wet sieved
AR - As received
NP - Non plastic

Liquid Limit Clause: 4.3 Cone Penetrometer definitive method
4.4 Cone Penetrometer one point method

Sample Type: B - Bulk Disturbed
U - Undisturbed

Remarks:
Results relate only to the specimen tested,in as received condition unless otherwise noted.
NOTE: **These clauses have been superceded by EN 17892-1 and EN17892-12.
Opinions and interpretations are outside the scope of accreditation. * denotes Customer supplied information.
This report shall not be reproduced except in fullwithout written approval from the Laboratory.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports
H Byrne (Laboratory Manager)

Approved by	Date	Page
H Byrne	11/01/22	1 of 1

TEST REPORT
Determination of Particle Size Distribution
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	82	
28	81	
20	76	
14	74	
10	72	
6.3	70	
5	69	
3.35	68	
2	66	
1.18	65	SAND
0.6	63	
0.425	62	
0.3	60	
0.15	56	
0.063	52	SILT/CLAY
0.037	45	
0.027	40	
0.017	32	
0.010	26	
0.007	20	
0.005	17	
0.002	8	

Contract No. 23679 Report No. R130391
Contract Name: Ballyouster Celbridge Kildare
BH/TP* : TP03
Sample No.* AA150906 Lab. Sample No. A21/6527
Sample Type: B
Depth* (m) 0.90 Customer: DBFL
Date Received 21/12/2021 Date Testing started 21/12/2021
Description: Brown slightly sandy, slightly gravelly, SILT

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2 Sample size did not meet the requirements of BS1377

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
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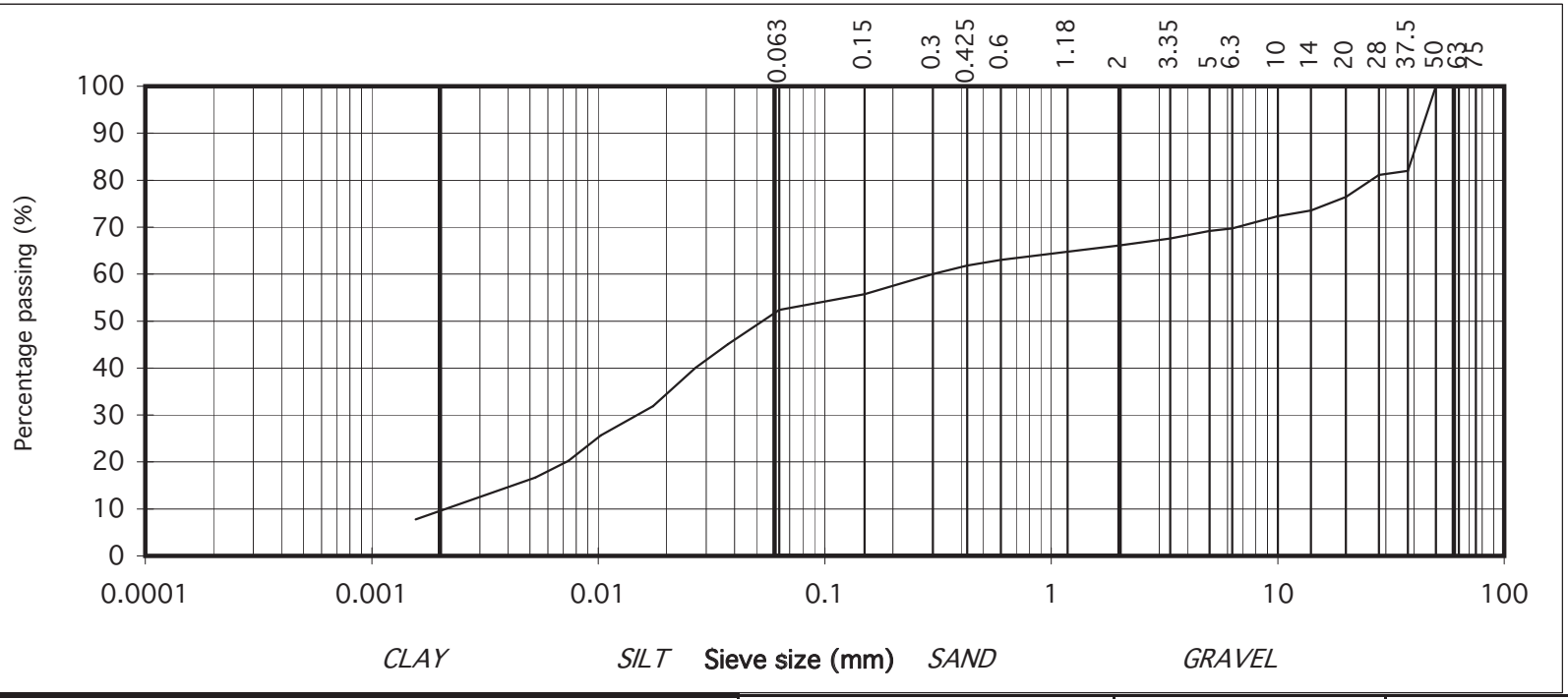

IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11/01/22	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT
Determination of Particle Size Distribution
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	97	
28	93	
20	89	
14	87	
10	86	
6.3	83	
5	81	
3.35	79	
2	77	
1.18	75	SAND
0.6	72	
0.425	70	
0.3	67	
0.15	59	
0.063	49	SILT/CLAY
0.038	42	
0.027	38	
0.017	33	
0.010	29	
0.007	24	
0.005	21	
0.002	14	

Contract No. 23679 Report No. R130392
Contract Name: Ballyouster Celbridge Kildare
BH/TP* : TP08
Sample No.* AA18360 Lab. Sample No. A21/6529
Sample Type: B
Depth* (m) 1.50 Customer: DBFL
Date Received 21/12/2021 Date Testing started 21/12/2021
Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
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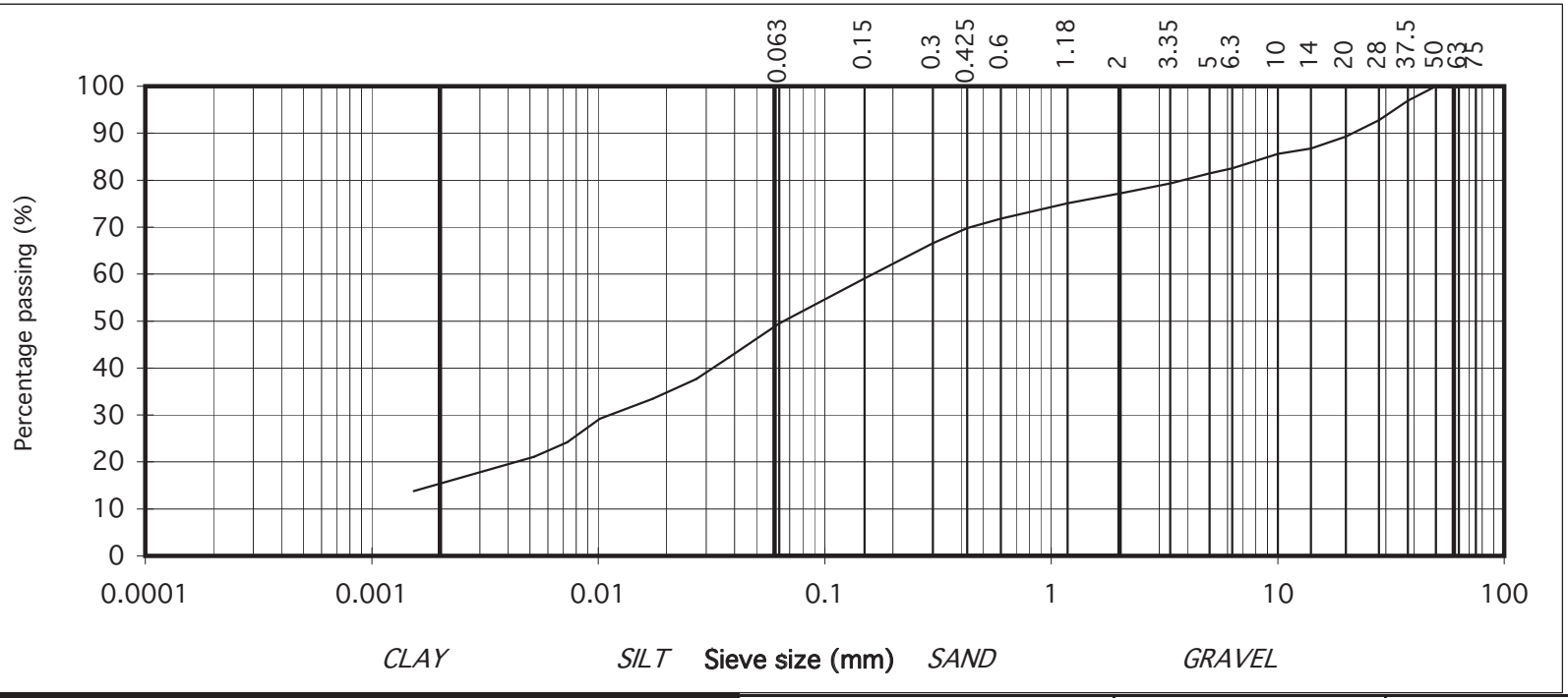

IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11/01/22	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT
Determination of Particle Size Distribution
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	97	
28	86	
20	85	
14	84	
10	82	
6.3	80	
5	79	
3.35	77	
2	75	
1.18	74	SAND
0.6	72	
0.425	71	
0.3	69	
0.15	58	
0.063	51	SILT/CLAY
0.038	43	
0.027	38	
0.017	33	
0.010	29	
0.007	24	
0.005	20	
0.002	13	

Contract No. 23679 Report No. R130393
Contract Name: Ballyouster Celbridge Kildare
BH/TP* : TP17
Sample No.* AA156974 Lab. Sample No. A21/6534
Sample Type: B
Depth* (m) 1.10 Customer: DBFL
Date Received 21/12/2021 Date Testing started 21/12/2021
Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
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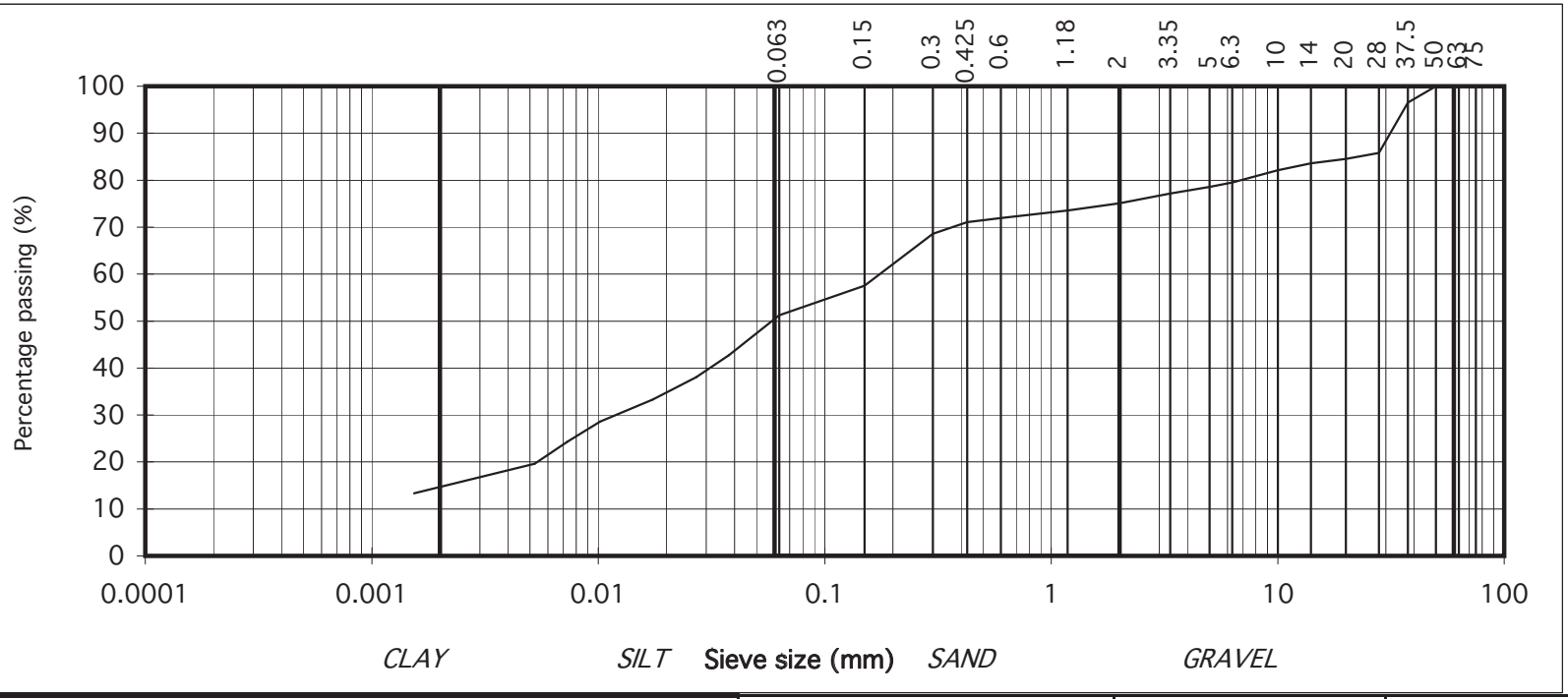

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Approved by:	Date:	Page no:
H Byrne	11/01/22	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

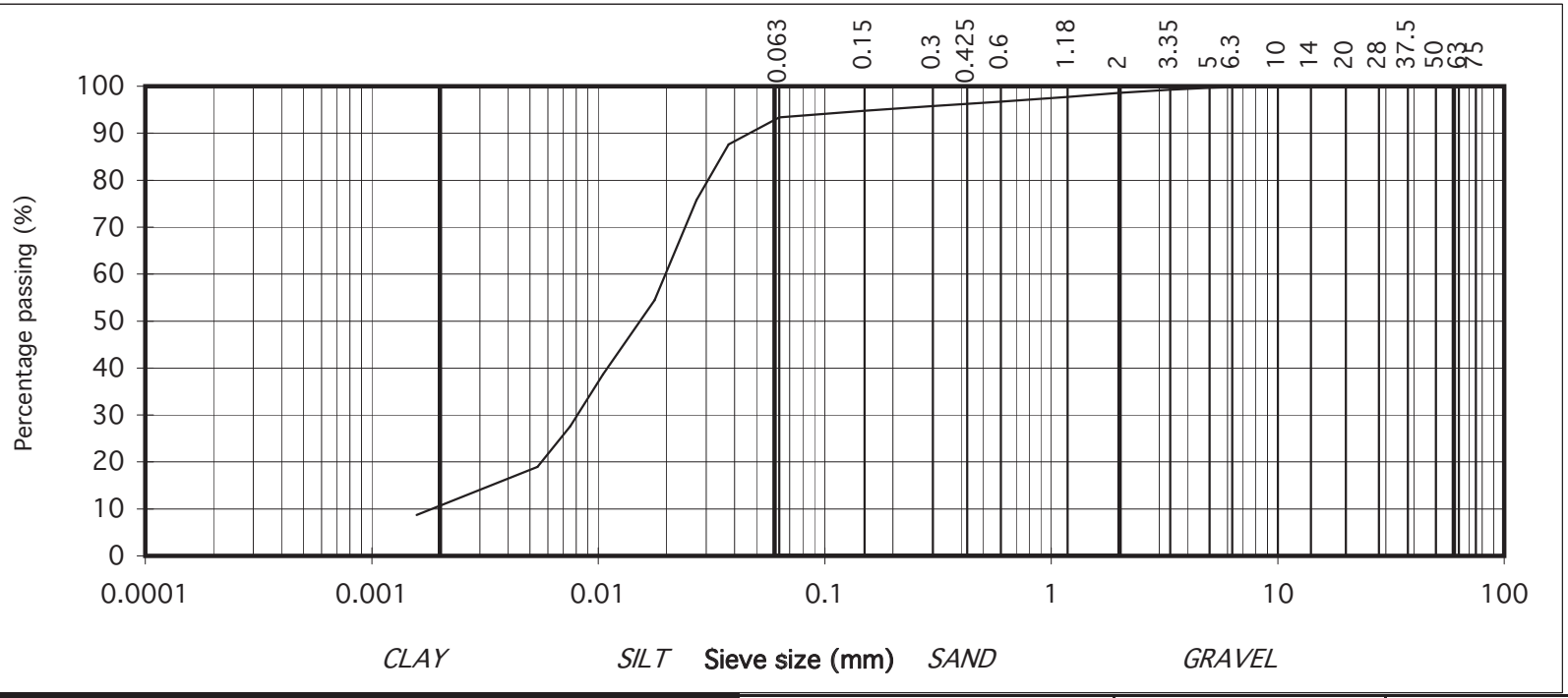
ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	99	
2	99	
1.18	98	SAND
0.6	97	
0.425	96	
0.3	96	
0.15	95	
0.063	93	SILT/CLAY
0.038	88	
0.027	76	
0.018	54	
0.010	39	
0.008	28	
0.005	19	
0.002	9	

Contract No. 23679 Report No. R130394
Contract Name: Ballyouster Celbridge Kildare
BH/TP* : TP23
Sample No.* AA156962 Lab. Sample No. A21/6536
Sample Type: B
Depth* (m) 1.50 Customer: DBFL
Date Received 21/12/2021 Date Testing started 21/12/2021
Description: Brown slightly sandy, slightly gravelly, SILT

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
This report shall not be reproduced except in full without the written approval of the Laboratory.



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Approved by:	Date:	Page no:
H Byrne	11/01/22	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

(Diametrial) POINT LOAD STRENGTH INDEX TEST DATA

Contract: Lands at Ballyoulster, Celbridge, Co.Kildare
Date of test: 19/01/2021

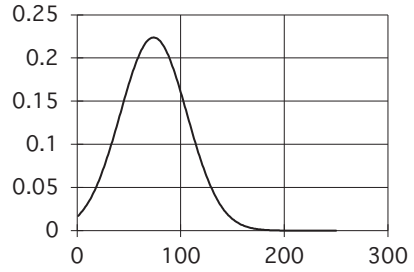
Sample Type: Core
Contract no. 23679

RC No.	Depth m	D (Diameter) mm	P (failure load) kN	F	Is (index strength) Mpa	Is(50) (index strength) Mpa	*UCS MPa	Type	Orienation
RC01	1.9	78	21.0	1.222	3.45	4.22	84	d	//
	2.0	78	26.0	1.222	4.27	5.22	104	d	//
	3.7	78	11.0	1.222	1.81	2.21	44	d	//
RC02	3.7	78	19.0	1.222	3.12	3.81	76	d	//
	4.8	78	29.0	1.222	4.77	5.82	116	d	//
	5.9	78	22.0	1.222	3.62	4.42	88	d	//
RC03	2.6	78	26.0	1.222	4.27	5.22	104	d	//
	2.8	78	11.0	1.222	1.81	2.21	44	d	//
	4.7	78	24.0	1.222	3.94	4.82	96	d	//
RC05	4.7	78	19.0	1.222	3.12	3.81	76	d	//
	5.7	78	21.0	1.222	3.45	4.22	84	d	//
	6.7	78	8.0	1.222	1.31	1.61	32	d	//
RC06	3.0	78	19.0	1.222	3.12	3.81	76	d	//
	4.0	78	28.0	1.222	4.60	5.62	112	d	//
	5.0	78	2.0	1.222	0.33	0.40	8	d	//
RC08	4.1	78	8.0	1.222	1.31	1.61	32	d	//
	5.3	78	26.0	1.222	4.27	5.22	104	d	//
	6.3	78	11.0	1.222	1.81	2.21	44	d	//

Statistical Summary Data	Is(50)	UCS*
Number of Samples Tested	18	18
Minimum	0.40	8
Average	3.69	74
Maximum	5.82	116
Standard Dev.	1.60	32
Upper 95% Confidence Limit	6.84	136.76
Lower 95% Confidence Limit	0.55	10.93

Comments:
*UCS taken as k x Point Load Is(50): k= 20

*UCS Normal Distribution Curve



Abbreviations

i	irregular
a	axial
b	block
d	diametral

approx. orientation to planes of weakness/bedding

U	unknown
P	perpendicular
//	parallel

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

IGSL
Unit F
M7 Business Park
Naas

Analytical Test Report: L21/04726/IGS - 21-22807

Your Project Reference:	**23679 Ballyouster Celbridge**		
Your Order Number:	19820	Testing Received / Instructed:	13/12/2021 / 13/12/2021
Report Issue Number:	1	Sample Tested:	13/12 to 12/01/2022
Samples Analysed:	4 aggregate samples	Report issued:	12/01/2022

Signed

James Gane
Data Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied

Samples were supplied by customer, results apply to the samples as received.

Within the report any information provided by the client is identified with a '#'

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue10/12/2020

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
L:\DATA\REPORTS\IRI294\[L21-04726-IGS - 21-22807.XLSXM]Methodology

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L21/04726/IGS - 21-22807

Project Reference - 23679 Ballyouster Celbridge

Analytical Test Results

NC Reference			206944	206945	206946	206947
Client Sample Reference			AA150910	AA156967	AA156977	AA160295
Location			Rock	Rock	Rock	Rock
Other ID			TP05	TP11	TP15	TP24
Date of Sampling			-	-	-	-
Supplier			-	-	-	-
Source			-	-	-	-
Sample Description			Brown Crushed Rock	Brown Crushed Rock	Brown Crushed Rock	Brown Crushed Rock
	Units	**Accreditation**				
EN 1744 Determinations						
Total Sulphur content (as S)	(%)	UKAS	< 0.01	0.08	0.03	0.03
Acid soluble sulphate content (as SO_3)	(%)	UKAS	0.05	0.04	0.05	0.03
Acid soluble sulphate content (as SO_4)	(%)	u	0.06	0.05	0.06	0.04
Water soluble sulphate content (as SO_3)	(%)	UKAS	< 0.01	0.02	0.02	0.02
Water soluble sulphate content (as SO_3)	(mg/l)	u	< 50	120	94	105
Water soluble sulphate content (as SO_4)	(%)	u	< 0.01	0.03	0.02	0.03
Water soluble sulphate content (as SO_4)	(mg/l)	u	< 60	143	113	125

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L21/04726/IGS - 21-22807

Project Reference - 23679 Ballyouster Celbridge

Analysis Methodologies

Determinant	Title	Details and Test method used
IGSSUITE-A	Suite A - EN 1744 ASS, WSS, TS (1.08, 09 & 10)	Total sulphur testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 11. Acid soluble sulphate testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 12. Water soluble sulphate testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 10.

Appendix 8 Laboratory Test Results. (Environmental)

2183

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	21-43195-2		
Initial Date of Issue:	16-Dec-2021	**Date of Re-Issue:**	04-Jan-2022
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballyouster Cellbridge Kildare (DBFL)		
Quotation No.:	Q20-19951	**Date Received:**	07-Dec-2021
Order No.:		**Date Instructed:**	07-Dec-2021
No. of Samples:	15		
Turnaround (Wkdays):	7	**Results Due:**	15-Dec-2021
Date Approved:	16-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-43368-1		
Initial Date of Issue:	16-Dec-2021		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballyouster Cellbridge Kildare (DBFL)		
Quotation No.:	Q20-21693	**Date Received:**	08-Dec-2021
Order No.:		**Date Instructed:**	08-Dec-2021
No. of Samples:	8		
Turnaround (Wkdays):	7	**Results Due:**	16-Dec-2021
Date Approved:	16-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-43968-1		
Initial Date of Issue:	24-Dec-2021		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	John Clancy		
Project	23679 Ballypuster Celbridge Kildare (DBFL)		
Quotation No.:	Q20-21693	**Date Received:**	14-Dec-2021
Order No.:		**Date Instructed:**	14-Dec-2021
No. of Samples:	12		
Turnaround (Wkdays):	7	**Results Due:**	22-Dec-2021
Date Approved:	24-Dec-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951				**Chemtest Sample ID.:**	1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:				Client Sample Ref.:	AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
				Sample Location:	TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
				Asbestos Lab:	DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-		-		-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	29	35	26	30	20	20	22	18	23
pH (2.5:1)	N	2010		4.0			[A] 7.8		[A] 8.4				
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] 0.49	[A] 0.42		[A] 1.6		[A] < 0.40	[A] 0.48	[A] < 0.40	[A] 0.41
Magnesium (Water Soluble)	N	2120	g/l	0.010			[A] < 0.010		[A] < 0.010				
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			[A] < 0.010		[A] < 0.010				
Total Sulphur	U	2175	%	0.010			[A] 0.028		[A] 0.030				
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Chloride (Water Soluble)	U	2220	g/l	0.010			[A] 0.013		[A] < 0.010				
Nitrate (Water Soluble)	N	2220	g/l	0.010			0.033		< 0.010				
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50		[A] < 0.50		[A] 2.8	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 3.6	[A] 6.6		[A] 3.3		[A] 2.8	[A] 4.4	[A] 6.2	[A] 1.8
Ammonium (Water Soluble)	U	2220	g/l	0.01			< 0.01		< 0.01				
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] < 0.010	[A] 0.022	[A] 0.033	[A] 0.064	[A] 0.027	[A] 0.019	[A] 0.016	[A] 0.033	[A] 0.026
Arsenic	U	2450	mg/kg	1.0	6.8	12		9.4		15	13	16	12
Barium	U	2450	mg/kg	10	50	59		78		72	110	65	69
Cadmium	U	2450	mg/kg	0.10	0.91	2.1		1.5		2.6	2.2	2.0	1.5
Chromium	U	2450	mg/kg	1.0	14	22		20		26	26	21	22
Molybdenum	U	2450	mg/kg	2.0	2.0	3.1		< 2.0		2.7	2.7	3.3	3.4
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0		< 2.0		< 2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	15	34		22		37	31	40	37
Mercury	U	2450	mg/kg	0.10	< 0.10	0.13		0.12		0.10	0.11	0.11	< 0.10
Nickel	U	2450	mg/kg	0.50	24	69		39		77	58	77	63
Lead	U	2450	mg/kg	0.50	16	21		26		28	33	30	29
Selenium	U	2450	mg/kg	0.20	0.29	1.2		0.66		0.39	0.56	0.76	1.1
Zinc	U	2450	mg/kg	0.50	89	120		87		120	120	110	120
Chromium (Trivalent)	N	2490	mg/kg	1.0	14	22		20		26	26	21	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10		< 10		< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			Chemtest Job No.:		21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951			Chemtest Sample ID.:		1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:			Client Sample Ref.:		AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
			Sample Location:		TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
			Asbestos Lab:		DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10	[A] < 10		[A] < 10		[A] < 10	[AC] < 10	[A] < 10	[A] < 10
Benzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0
Naphthalene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluorene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Phenanthrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.025		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[a]anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.026		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Chrysene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.028		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.031		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[a]pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.054		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.039		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.022		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] 0.038		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Coronene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	[A] < 0.20	[A] < 0.20		[A] 0.33		[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20
PCB 28	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1335207	1335208	1335209	1335210	1335211	1335212	1335213	1335214	1335215
Order No.:			Client Sample Ref.:		AA150903	AA150901	AA150905	AA18359	AA160299	AA150907	AA150915	AA156960	AA156973
			Sample Location:		TP01	TP02	TP03	TP08	TP09	TP10	TP14	TP16	TP17
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.30	0.30	0.50	0.70	0.80	0.30	0.50	0.50
			Asbestos Lab:		DURHAM	DURHAM		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 52	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10		< 0.10		< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951				**Chemtest Sample ID.:**	1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:				Client Sample Ref.:	AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
				Sample Location:	TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
				Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A		-		-	-	-	-	-	-
Asbestos Identification	U	2192		N/A		No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	21	21	24	12	12	12	10	17	12
pH (2.5:1)	N	2010		4.0	[A] 8.4		[A] 8.1						
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		[A] < 0.40		[A] < 0.40	[A] < 0.40	[A] < 0.40	[A] < 0.40	[A] 0.64	[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010	[A] < 0.010		[A] < 0.010						
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.039		[A] 0.16						
Total Sulphur	U	2175	%	0.010	[A] 0.046		[A] 0.048						
Sulphur (Elemental)	U	2180	mg/kg	1.0		[A] 1.1		[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Chloride (Water Soluble)	U	2220	g/l	0.010	[A] < 0.010		[A] < 0.010						
Nitrate (Water Soluble)	N	2220	g/l	0.010	0.011		< 0.010						
Cyanide (Total)	U	2300	mg/kg	0.50		[A] < 0.50		[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		[A] 15		[A] 8.1	[A] 26	[A] 33	[A] 16	[A] 7.5	[A] 7.3
Ammonium (Water Soluble)	U	2220	g/l	0.01	< 0.01		< 0.01						
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.024	[A] 0.052	[A] 0.11	[A] 0.079	[A] 0.031	[A] 0.035	[A] < 0.010	[A] 0.032	[A] < 0.010
Arsenic	U	2450	mg/kg	1.0		13		34	13	16	17	19	22
Barium	U	2450	mg/kg	10		51		160	87	53	350	73	83
Cadmium	U	2450	mg/kg	0.10		2.2		2.8	0.97	1.4	2.1	2.4	3.5
Chromium	U	2450	mg/kg	1.0		22		22	11	16	23	23	30
Molybdenum	U	2450	mg/kg	2.0		2.1		2.9	< 2.0	3.0	3.2	< 2.0	3.6
Antimony	N	2450	mg/kg	2.0		< 2.0		2.0	< 2.0	< 2.0	< 2.0	2.0	2.5
Copper	U	2450	mg/kg	0.50		27		27	24	26	29	32	42
Mercury	U	2450	mg/kg	0.10		< 0.10		0.11	< 0.10	< 0.10	< 0.10	< 0.10	0.14
Nickel	U	2450	mg/kg	0.50		58		69	48	59	78	60	93
Lead	U	2450	mg/kg	0.50		31		52	21	23	24	29	52
Selenium	U	2450	mg/kg	0.20		0.45		0.30	< 0.20	0.48	< 0.20	< 0.20	0.65
Zinc	U	2450	mg/kg	0.50		150		190	58	88	89	110	230
Chromium (Trivalent)	N	2490	mg/kg	1.0		22		22	11	16	23	23	30
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10		< 10		< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL					Chemtest Job No.:	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951					Chemtest Sample ID.:	1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:					Client Sample Ref.:	AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
					Sample Location:	TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
					Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		[A] < 5.0		[A] < 5.0	[AC] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		[A] < 10		[A] < 10	[AC] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	
Benzene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Toluene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Ethylbenzene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
m & p-Xylene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
o-Xylene	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		[A] < 1.0		[A] < 1.0	[AC] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	
Naphthalene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Acenaphthylene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Acenaphthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Fluorene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Phenanthrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[a]anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Chrysene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[b]fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[k]fluoranthene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[a]pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Coronene	N	2800	mg/kg	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	
Total Of 17 PAH's	N	2800	mg/kg	0.20		[A] < 0.20		[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	
PCB 28	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL					**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43368	21-43368	21-43368
Quotation No.: Q20-19951					**Chemtest Sample ID.:**	1335216	1335217	1335218	1335219	1335220	1335221	1336011	1336013	1336014
Order No.:					Client Sample Ref.:	AA156974	AA18361	AA156957	AA156970	AA18363	AA156961	AA160297	AA156966	AA18365
					Sample Location:	TP17	TP18	TP19	TP20	TP21	TP23	TP07	TP11	TP12
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.10	0.50	0.60	0.50	0.50	0.50	0.50	0.50	0.50
					Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
PCB 52	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
PCB 90+101	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
PCB 118	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
PCB 153	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
PCB 138	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
PCB 180	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010		[A] < 0.0010		[A] < 0.0010	[AC] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	
Total Phenols	U	2920	mg/kg	0.10		< 0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**	21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951				**Chemtest Sample ID.:**	1336017	1339081	1339082	1339085	1339089	1339090
Order No.:				Client Sample Ref.:	AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
				Sample Location:	TP22	TP06	TP06	TP13	TP23	TP24
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.50	0.6	0.9	0.3	1.5	0.5
				Asbestos Lab:	DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-		-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	17	17	17	15	32	17
pH (2.5:1)	N	2010		4.0			[A] 8.5			
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] 0.48	[A] < 0.40		[A] < 0.40	[A] < 0.40	[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010			[A] < 0.010			
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			[A] < 0.010			
Total Sulphur	U	2175	%	0.010			[A] 0.029			
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] 1.1	[A] < 1.0	[A] 14
Chloride (Water Soluble)	U	2220	g/l	0.010			[A] < 0.010			
Nitrate (Water Soluble)	N	2220	g/l	0.010			0.012			
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50		[A] 6.1	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 6.2	[A] 49		[A] 19	[A] 9.8	[A] 2.4
Ammonium (Water Soluble)	U	2220	g/l	0.01			< 0.01			
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.037	[A] 0.021	[A] 0.024	[A] 0.030	[A] < 0.010	[A] 0.024
Arsenic	U	2450	mg/kg	1.0	21	3.7		4.9	5.1	3.8
Barium	U	2450	mg/kg	10	83	25		36	20	15
Cadmium	U	2450	mg/kg	0.10	3.0	0.48		0.69	< 0.10	0.45
Chromium	U	2450	mg/kg	1.0	29	8.1		10	8.3	5.2
Molybdenum	U	2450	mg/kg	2.0	4.1	< 2.0		< 2.0	< 2.0	< 2.0
Antimony	N	2450	mg/kg	2.0	2.7	< 2.0		< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	41	15		12	5.8	9.5
Mercury	U	2450	mg/kg	0.10	0.15	< 0.10		< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	100	27		23	11	23
Lead	U	2450	mg/kg	0.50	53	10		12	16	4.7
Selenium	U	2450	mg/kg	0.20	1.4	< 0.20		< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	190	32		47	8.6	21
Chromium (Trivalent)	N	2490	mg/kg	1.0	29	8.1		10	8.3	5.2
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10		< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1336017	1339081	1339082	1339085	1339089	1339090
Order No.:			Client Sample Ref.:		AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
			Sample Location:		TP22	TP06	TP06	TP13	TP23	TP24
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.6	0.9	0.3	1.5	0.5
			Asbestos Lab:		DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0	[A] < 5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0	[A] < 5.0		[A] < 5.0	[A] < 5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10	[A] < 10		[A] < 10	[A] < 10	[A] < 10
Benzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0		[A] < 1.0	[A] < 1.0	[A] < 1.0
Naphthalene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Acenaphthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Fluorene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Phenanthrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.9
Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 2.5
Fluoranthene	N	2800	mg/kg	0.010	[A] 0.036	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 11
Pyrene	N	2800	mg/kg	0.010	[A] 0.020	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 8.6
Benzo[a]anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 6.5
Chrysene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.9
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 8.7
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.0
Benzo[a]pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 5.3
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.7
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 1.3
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] 3.1
Coronene	N	2800	mg/kg	0.010	[A] < 0.010	[A] < 0.010		[A] < 0.010	[A] < 0.010	[A] < 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	[A] < 0.20	[A] < 0.20		[A] < 0.20	[A] < 0.20	[A] 65
PCB 28	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010

Results - Soil

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL			**Chemtest Job No.:**		21-43368	21-43968	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951			**Chemtest Sample ID.:**		1336017	1339081	1339082	1339085	1339089	1339090
Order No.:			Client Sample Ref.:		AA156972	AA150909	AA150910	AA150913	AA156962	AA160295
			Sample Location:		TP22	TP06	TP06	TP13	TP23	TP24
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.6	0.9	0.3	1.5	0.5
			Asbestos Lab:		DURHAM	DURHAM		DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
PCB 52	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010		[A] < 0.0010	[A] < 0.0010	[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10

Results - Leachate

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL						**Chemtest Job No.:**	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195	21-43195
Quotation No.: Q20-19951						**Chemtest Sample ID.:**	1335207	1335208	1335210	1335212	1335213	1335214	1335215	1335217	1335219	1335220	1335221
Order No.:						Client Sample Ref.:	AA150903	AA150901	AA18359	AA150907	AA150915	AA156960	AA156973	AA18361	AA156970	AA18363	AA156961
						Sample Location:	TP01	TP02	TP08	TP10	TP14	TP16	TP17	TP18	TP20	TP21	TP23
						Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
						Top Depth (m):	0.40	0.30	0.50	0.80	0.30	0.50	0.50	0.50	0.50	0.50	0.50
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**												
pH	U	1010	10:1		N/A		8.5	8.3	8.4	8.6	8.3	8.6	8.6	8.5	8.6	8.7	8.7
Ammonium	U	1220	10:1	mg/l	0.050		< 0.050	0.16	0.067	< 0.050	< 0.050	0.056	< 0.050	0.067	0.065	< 0.050	0.057
Ammonium	N	1220	10:1	mg/kg	0.10		0.44	1.8	0.77	0.43	0.52	0.69	0.29	0.80	0.80	0.58	0.72
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[j]fluoranthene	N	1800	10:1	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Results - Leachate

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

Client: IGSL				**Chemtest Job No.:**		21-43368	21-43368	21-43368	21-43368	21-43968	21-43968	21-43968	21-43968
Quotation No.: Q20-19951				**Chemtest Sample ID.:**		1336011	1336013	1336014	1336017	1339081	1339085	1339089	1339090
Order No.:				Client Sample Ref.:		AA160297	AA156966	AA18365	AA156972	AA150909	AA150913	AA156962	AA160295
				Sample Location:		TP07	TP11	TP12	TP22	TP06	TP13	TP23	TP24
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.50	0.50	0.50	0.6	0.3	1.5	0.5
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**								
pH	U	1010	10:1		N/A	8.3	8.5	8.6	8.4	8.6	8.7	8.7	8.9
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	0.11	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.078
Ammonium	N	1220	10:1	mg/kg	0.10	0.52	1.3	0.42	0.56	0.47	0.36	0.32	1.1
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01	< 0.01	0.55	0.19	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[j]fluoranthene	N	1800	10:1	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010				

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335207						
Sample Ref:	AA150903						
Sample ID:							
Sample Location:	TP01						
Top Depth(m):	0.40						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.46	3	5	6
Loss On Ignition	2610	U	%	2.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0040	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0004	0.0043	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0008	0.0082	0.5	10	70
Copper	1455	U	0.0015	0.015	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0015	0.015	0.5	10	30
Nickel	1455	U	0.0013	0.013	0.4	10	40
Lead	1455	U	0.0006	0.0055	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.006	0.061	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.20	2.0	10	150	500
Sulphate	1220	U	1.9	19	1000	20000	50000
Total Dissolved Solids	1020	N	43	420	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	110	1100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	29

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335208						
Sample Ref:	AA150901						
Sample ID:							
Sample Location:	TP02						
Top Depth(m):	0.30						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.90	3	5	6
Loss On Ignition	2610	U	%	13	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0060	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0008	0.0076	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0027	0.027	0.5	10	70
Copper	1455	U	0.0027	0.027	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0038	0.5	10	30
Nickel	1455	U	0.0032	0.032	0.4	10	40
Lead	1455	U	0.0007	0.0073	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.010	0.099	4	50	200
Chloride	1220	U	1.9	19	800	15000	25000
Fluoride	1220	U	0.18	1.8	10	150	500
Sulphate	1220	U	3.3	33	1000	20000	50000
Total Dissolved Solids	1020	N	33	320	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	67	670	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	35

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335210						
Sample Ref:	AA18359						
Sample ID:							
Sample Location:	TP08						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.5	3	5	6
Loss On Ignition	2610	U	%	7.4	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] 0.33	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0056	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0060	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0014	0.014	0.5	10	30
Nickel	1455	U	0.0015	0.015	0.4	10	40
Lead	1455	U	0.0007	0.0065	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.58	5.8	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	65	640	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	77	770	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	30

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335212						
Sample Ref:	AA150907						
Sample ID:							
Sample Location:	TP10						
Top Depth(m):	0.80						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.49	3	5	6
Loss On Ignition	2610	U	%	3.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0065	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0010	0.010	0.5	10	30
Nickel	1455	U	0.0007	0.0071	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	55	550	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	42	420	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	20

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335213						
Sample Ref:	AA150915						
Sample ID:							
Sample Location:	TP14						
Top Depth(m):	0.30						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.3	3	5	6
Loss On Ignition	2610	U	%	4.6	--	--	10
Total BTEX	2760	U	mg/kg	[AC] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[AC] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[AC] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0028	0.029	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	0.00013	0.0013	0.04	1	5
Chromium	1455	U	0.0027	0.027	0.5	10	70
Copper	1455	U	0.0055	0.055	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0012	0.012	0.5	10	30
Nickel	1455	U	0.0068	0.068	0.4	10	40
Lead	1455	U	0.0022	0.022	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0007	0.0067	0.1	0.5	7
Zinc	1455	U	0.016	0.16	4	50	200
Chloride	1220	U	2.9	29	800	15000	25000
Fluoride	1220	U	0.41	4.1	10	150	500
Sulphate	1220	U	4.8	48	1000	20000	50000
Total Dissolved Solids	1020	N	61	600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	110	1100	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	22

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335214						
Sample Ref:	AA156960						
Sample ID:							
Sample Location:	TP16						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.70	3	5	6
Loss On Ignition	2610	U	%	2.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0026	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0013	0.013	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0013	0.013	0.5	10	30
Nickel	1455	U	0.0009	0.0091	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.62	6.2	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	60	600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	42	420	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	18

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335215						
Sample Ref:	AA156973						
Sample ID:							
Sample Location:	TP17						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.97	3	5	6
Loss On Ignition	2610	U	%	1.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0005	0.0051	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0009	0.0088	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0005	0.0051	0.5	10	30
Nickel	1455	U	0.0024	0.024	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0008	0.0084	0.1	0.5	7
Zinc	1455	U	0.003	0.033	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.47	4.7	10	150	500
Sulphate	1220	U	1.3	13	1000	20000	50000
Total Dissolved Solids	1020	N	50	500	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	90	900	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	23

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335217						
Sample Ref:	AA18361						
Sample ID:							
Sample Location:	TP18						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.79	3	5	6
Loss On Ignition	2610	U	%	3.1	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0028	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0009	0.0087	0.5	10	70
Copper	1455	U	0.0011	0.011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0020	0.020	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.50	5.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	21

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335219						
Sample Ref:	AA156970						
Sample ID:							
Sample Location:	TP20						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.30	3	5	6
Loss On Ignition	2610	U	%	7.4	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0020	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0005	0.0052	0.5	10	70
Copper	1455	U	0.0007	0.0069	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0017	0.017	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.7	17	800	15000	25000
Fluoride	1220	U	0.55	5.5	10	150	500
Sulphate	1220	U	1.5	15	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	29	290	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335220						
Sample Ref:	AA18363						
Sample ID:							
Sample Location:	TP21						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.71	3	5	6
Loss On Ignition	2610	U	%	1.2	--	--	10
Total BTEX	2760	U	mg/kg	[AC] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[AC] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[AC] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0034	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0057	0.5	10	70
Copper	1455	U	0.0018	0.018	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0052	0.052	0.5	10	30
Nickel	1455	U	0.0018	0.018	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.96	9.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	72	720	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43195						
Chemtest Sample ID:	1335221						
Sample Ref:	AA156961						
Sample ID:							
Sample Location:	TP23						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.44	3	5	6
Loss On Ignition	2610	U	%	5.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0023	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0021	0.021	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.0	20	800	15000	25000
Fluoride	1220	U	0.34	3.4	10	150	500
Sulphate	1220	U	1.5	15	1000	20000	50000
Total Dissolved Solids	1020	N	65	650	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	35	350	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336011						
Sample Ref:	AA160297				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:							
Sample Location:	TP07						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**				
Total Organic Carbon	2625	U	%	[A] 0.30	3	5	6
Loss On Ignition	2610	U	%	1.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0023	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0012	0.012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0010	0.0095	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.20	2.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	46	460	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	10

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336013						
Sample Ref:	AA156966						
Sample ID:							
Sample Location:	TP11						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.89	3	5	6
Loss On Ignition	2610	U	%	4.2	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.014	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0007	0.0067	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0007	0.0068	0.5	10	70
Copper	1455	U	0.0025	0.025	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0022	0.022	0.5	10	30
Nickel	1455	U	0.0018	0.018	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.005	0.051	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.66	6.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	31	310	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336014						
Sample Ref:	AA18365						
Sample ID:							
Sample Location:	TP12						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.38	3	5	6
Loss On Ignition	2610	U	%	3.9	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0055	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0006	0.0061	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0025	0.025	0.5	10	30
Nickel	1455	U	0.0016	0.016	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	0.003	0.032	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.79	7.9	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	64	640	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	33	330	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyouster Cellbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43368						
Chemtest Sample ID:	1336017						
Sample Ref:	AA156972						
Sample ID:							
Sample Location:	TP22						
Top Depth(m):	0.50				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**				
Total Organic Carbon	2625	U	%	[A] 1.1	3	5	6
Loss On Ignition	2610	U	%	4.1	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.020	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0007	0.0075	0.5	10	70
Copper	1455	U	0.0014	0.014	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0021	0.021	0.5	10	30
Nickel	1455	U	0.0005	0.0054	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.2	22	800	15000	25000
Fluoride	1220	U	0.55	5.5	10	150	500
Sulphate	1220	U	4.0	40	1000	20000	50000
Total Dissolved Solids	1020	N	100	1000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	20	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputer Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339081						
Sample Ref:	AA150909						
Sample ID:							
Sample Location:	TP06						
Top Depth(m):	0.6						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.47	3	5	6
Loss On Ignition	2610	U	%	3.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.036	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0007	0.0066	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.10	1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	29	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputer Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339085						
Sample Ref:	AA150913				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:							
Sample Location:	TP13						
Top Depth(m):	0.3						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**				
Total Organic Carbon	2625	U	%	[A] 0.65	3	5	6
Loss On Ignition	2610	U	%	3.8	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.037	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0005	0.0052	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.090	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	26	260	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	15

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339089						
Sample Ref:	AA156962						
Sample ID:							
Sample Location:	TP23						
Top Depth(m):	1.5				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**				
Total Organic Carbon	2625	U	%	[A] 0.60	3	5	6
Loss On Ignition	2610	U	%	2.7	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.023	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0027	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0040	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.088	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	20	190	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	2.9	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	32

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 23679 Ballyputser Celbridge Kildare (DBFL)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-43968						
Chemtest Sample ID:	1339090						
Sample Ref:	AA160295						
Sample ID:							
Sample Location:	TP24						
Top Depth(m):	0.5						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.24	3	5	6
Loss On Ignition	2610	U	%	2.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] 65	100	--	--
pH	2010	U		8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.089	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0005	0.0055	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0003	0.0028	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.093	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	29	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1335207	AA150903		TP01		A	Amber Glass 250ml
1335208	AA150901		TP02		A	Amber Glass 250ml
1335209	AA150905		TP03		A	Amber Glass 250ml
1335210	AA18359		TP08		A	Amber Glass 250ml
1335211	AA160299		TP09		A	Amber Glass 250ml
1335211	AA160299		TP09		A	Plastic Tub 500g
1335212	AA150907		TP10		A	Amber Glass 250ml
1335213	AA150915		TP14		AC	Plastic Tub 500g
1335214	AA156960		TP16		A	Amber Glass 250ml
1335215	AA156973		TP17		A	Amber Glass 250ml
1335215	AA156973		TP17		A	Plastic Tub 500g
1335216	AA156974		TP17		A	Amber Glass 250ml
1335217	AA18361		TP18		A	Amber Glass 250ml
1335218	AA156957		TP19		A	Plastic Tub 500g
1335219	AA156970		TP20		A	Amber Glass 250ml
1335219	AA156970		TP20		A	Plastic Tub 500g
1335220	AA18363		TP21		AC	Plastic Tub 500g
1335221	AA156961		TP23		A	Amber Glass 250ml
1335221	AA156961		TP23		A	Plastic Tub 500g
1335222			TP12		A	Plastic Tub 500g
1336011	AA160297		TP07		A	Amber Glass 250ml

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1336011	AA160297		TP07		A	Plastic Tub 500g
1336013	AA156966		TP11		A	Amber Glass 250ml
1336014	AA18365		TP12		A	Amber Glass 250ml
1336017	AA156972		TP22		A	Amber Glass 250ml
1336017	AA156972		TP22		A	Plastic Tub 500g
1339081	AA150909		TP06		A	Amber Glass 250ml
1339081	AA150909		TP06		A	Plastic Tub 500g
1339082	AA150910		TP06		A	Amber Glass 250ml
1339082	AA150910		TP06		A	Plastic Tub 500g
1339085	AA150913		TP13		A	Amber Glass 250ml
1339085	AA150913		TP13		A	Plastic Tub 500g
1339089	AA156962		TP23		A	Amber Glass 250ml
1339089	AA156962		TP23		A	Plastic Tub 500g
1339090	AA160295		TP24		A	Amber Glass 250ml
1339090	AA160295		TP24		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.

Test Methods

SOP	Title	Parameters included	Method summary
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix 9 Site Plan

SITE INVESTIGATION SCHEDULE (SI-CBR)

SI TAG	EASTING	NORTHING	DEPTH
CBR01	697946.265	732938.994	0.5m
CBR02	697938.451	732831.771	0.5m
CBR03	698068.737	732904.280	0.5m
CBR04	698080.263	732859.958	0.5m
CBR05	698210.821	732773.349	0.5m
CBR06	698236.963	732861.892	0.5m
CBR07	698302.981	732931.438	0.5m
CBR08	698381.558	733100.509	0.5m
CBR09	698346.635	733177.058	0.5m
CBR10	698265.269	733148.597	0.5m
CBR11	698268.168	733086.384	0.5m
CBR12	698324.422	733179.201	0.5m

SITE INVESTIGATION SCHEDULE (SI-ROT CORE)

SI TAG	EASTING	NORTHING	DEPTH
RC01	697897.422	732879.244	6.0m
RC02	698084.945	732891.297	6.0m
RC03	698137.327	732774.884	6.0m
RC04	698236.182	732852.089	6.0m
RC05	698376.676	732889.377	6.0m
RC06	698407.141	732126.532	9.0m
RC07	698311.748	733079.440	6.0m
RC08	698265.440	733043.005	6.0m

SITE INVESTIGATION SCHEDULE (SI-TRIAL PIT)

SI TAG	EASTING	NORTHING	DEPTH
TP01	697910.387	732874.204	3.0m
TP02	697926.181	732917.390	3.0m
TP03	697952.595	732975.893	3.0m
TP04	697974.653	732848.174	3.0m
TP05	698082.129	732841.998	3.0m
TP06	698099.554	732884.914	3.0m
TP07	698118.771	732834.091	3.0m
TP08	698214.403	732835.451	3.0m
TP09	698184.769	732829.624	3.0m
TP10	698312.256	732881.794	3.0m
TP11	698323.986	732908.973	3.0m
TP12	698407.238	733125.757	3.0m
TP13	698355.957	733199.623	3.0m
TP14	697964.403	732916.292	3.0m
TP15	698478.289	733089.059	3.0m
TP16	698311.532	733134.764	3.0m
TP17	698307.497	733163.034	3.0m
TP18	698265.515	733258.759	3.0m
TP19	698402.684	733084.614	3.0m
TP20	698377.138	733016.111	3.0m
TP21	698380.192	733117.330	3.0m
TP22	698402.647	733041.998	3.0m
TP23	698302.846	733157.883	3.0m
TP24	697965.877	733023.709	3.0m
TP25	698237.786	733139.697	3.0m
TP26	698251.108	733146.323	3.0m

SITE INVESTIGATION SCHEDULE (SI-DCPT)

SI TAG	EASTING	NORTHING	DEPTH
DCPT01	697902.882	732929.155	6.0m
DCPT02	697927.283	732912.727	6.0m
DCPT03	697976.341	732873.339	6.0m
DCPT04	697927.841	732949.534	6.0m
DCPT05	698002.410	733008.516	6.0m
DCPT06	697991.860	732910.123	6.0m
DCPT07	698058.550	732752.875	6.0m
DCPT08	698027.614	732842.726	6.0m
DCPT09	698076.940	732902.005	6.0m
DCPT10	698167.354	732968.486	6.0m
DCPT11	698145.323	732880.011	6.0m
DCPT12	698175.029	732791.717	6.0m
DCPT13	698170.166	732830.795	6.0m
DCPT14	698210.987	732860.723	6.0m
DCPT15	698407.166	733120.225	6.0m
DCPT16	698381.146	733163.291	6.0m
DCPT17	698303.274	733124.619	6.0m
DCPT18	698265.206	733139.987	6.0m
DCPT19	698283.261	733059.809	6.0m
DCPT20	698306.223	733022.744	6.0m
DCPT21	698302.692	733179.206	6.0m
DCPT22	698305.558	733222.440	6.0m
DCPT23	698302.239	733239.410	6.0m
DCPT24	698281.963	733281.768	6.0m

SITE INVESTIGATION SCHEDULE (SI-INFIL. TEST)

SI TAG	EASTING	NORTHING
IT01	697928.851	732921.298
IT02	697913.286	732878.178
IT03	697912.812	732863.014
IT04	698012.093	732886.671
IT05	697964.492	732920.216
IT06	698054.001	732853.603
IT07	698058.473	732899.365
IT08	698082.117	732943.910
IT09	698145.291	732853.293
IT10	698214.398	732853.203
IT11	698169.447	732776.458
IT12	698162.888	732783.570
IT13	698322.774	732912.868
IT14	698377.111	732912.104
IT15	698308.539	732963.138
IT16	698343.892	733003.206
IT17	698251.413	733149.321
IT18	698301.285	733074.792
IT19	698417.669	733084.336
IT20	698307.712	733158.194
IT21	698337.710	733233.418
IT22	698344.100	733284.968
IT23	698265.599	733282.959
IT24	698407.774	733045.475

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ON ORIGINAL

NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
2. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE IN METERS AND ARE RELATED TO ORDNANCE DATUM. CO-ORDINATES RELATE TO ITM.
4. CONTRACTOR TO UNDERTAKE INVESTIGATION IN THE VICINITY OF PROPOSED TEST LOCATIONS TO MINIMISE THE POTENTIAL FOR ENCOUNTERING EXISTING SERVICES DURING EXCAVATION (INCLUDING BUT NOT LIMITED TO USE OF CAT TYPE CABLE DETECTION DEVICE) AND OBTAIN AND REVIEW RELEVANT UTILITY OPERATOR RECORD DRAWINGS.
5. CBRs TO BE PLATE BEARING TESTS UNDERTAKEN AT SUBSOIL LEVEL (I.E. TOPSOIL REMOVED FROM SURFACE).
6. TRIAL PITS UP TO 3m DEPTH.
7. BOREHOLES TO BE CARRIED TO A DEPTH OF 6m.
8. CONTRACTOR TO BACKFILL ALL EXCAVATIONS ON COMPLETION ON INVESTIGATIONS.
9. 1 NO. BOREHOLE FOR EACH APARTMENT BLOCK AND THE OTHER LARGER SCALE BUILDINGS SUCH AS THE COMMUNITY CENTRE AND CRECHE/ PUMPING STATION, NUMBERED
10. A TRIAL PIT AND A DYNAMIC PENETRATION CONE TEST SHALL ACCOMPANY EACH BOREHOLE AT A SUITABLY CLOSE DISTANCE TO EACH TRIAL PIT (WITHIN CIRCA 2–3m);
    a. THE BOREHOLES THEMSELVES MAY OCCUR WITHIN THE ENVELOPE OF EACH OF THESE BUILDINGS, HOWEVER THE TRIAL PITS MUST NOT.
11. EACH CLUSTER OF TERRACED AND SEMI-DETACHED HOUSES SHALL NECESSITATE TRIAL PITS AS MARKED, EACH WITH AN ACCOMPANYING DCPT.
    a. AGAIN, THE TRIAL PITS SHALL NOT STRAY INTO THE PLAN ENVELOPE OF ANY OF THE HOUSES, BUT REMAIN AT A SUITABLE OFFSET OUTSIDE OF SUCH (2–3m).
11. EACH TRIAL PIT TO INCLUDE CBR

SITE INVESTIGATION LEGEND

- CBR — CBR, PLATE BEARING TEST (XX No.)
- WS — WINDOW SAMPLES (XX No.)
- TP — TRIAL PIT (XX No.)
- DCP — DYNAMIC CONE PENETROMETER TEST (XX No.)
- IT — INFILTRATION TRENCH (XX No.)
- RC — ROTARY CORE TARGET DEPTH 6m BELOW GROUND LEVEL (XX No.)
- ST — SLIT TRENCH (XX No.)

ORDNANCE SURVEY IRELAND LICENCE No EN 0017921
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GOVERNMENT OF IRELAND

rev	date	description	by	chkd
P02	08-09-21	TESTS LOCATION UPDATED	GIS	NOH
P01	02-09-21	ISSUED FOR INFORMATION	GIS	NOH

client approval: A – Approved; B – Approved with comments; C – Do not use

suitability: S0 - WORK IN PROGRESS | issue purpose: PLANNING

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project ref: BALLYOULSTER KDA2 - PROPOSED PHASE 1 RESIDENTIAL DEVELOPMENT

drawing title: SITE INVESTIGATION

client: MICHAEL MADDEN, RECEIVER OVER CERTAIN ASSETS OF MAPLEWOOD DEVELOPMENTS LIMITED

designed by	author	scale	sheet size
xxx	xxx	VALUE	A0

drawing no.: 180221-DBFL-EW-SP-DR-C-9050 | revision: P02